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APPLICATION STRATEGY LEARNING HEURISTICS IN INCREASE RESULTS STUDY MATHEMATICS STUDENT CLASS V ELEMENTARY SCHOOL

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ABSTRACT

The problem of learning mathematics at SD 06 satai c class v shows that learning outcomes are still low, this research aims to 1) To determine the increase in learning outcomes using heuristic learning strategies in class V of SD Negeri 06 Satai C. 2) To see the results of mathematics learning reaching the KKM individually by implementing heuristic learning strategies in class V of SD Negeri 06 Satai C. 3) To find out whether student learning activities are classified as good in debit material when heuristic learning strategies are applied. The research used was a quasi experimental design research with a one group pretest-posttest design. The population of this study was class V students at SD Negeri 06 Satai C. The sample was class V with a total of 24 students. N-Gain test to see improvements in student mathematics learning outcomes. The result is N-Gain = 0,318 with medium criteria in the range $0,3 \leq N - \text{gain} < 0,7$. The results show that there is an increase. Next, use the one sample t-test formula. The normality test results showed that X^2_{count} was 6,355 and X^2_{Table} was 7,814. Because $X^2_{\text{count}} \leq X^2_{\text{Table}}$ is $6,355 \leq 7,814$, it is normally distributed, so it is known that $t_{\text{count}} = 5,915$ and $t_{\text{table}} = 2,010$, we get $t_{\text{count}} \geq t_{\text{table}} = 5,915 \geq 2,010$ then H_a is accepted and H_o is rejected. So it can be concluded that individual students' mathematics learning outcomes reach the KKM. Next, to find out students' learning activities, use an observation sheet. From the data, the percentage of student learning activities is 85%. This shows that students' learning activities during learning are in the very active category and are classified as good.

INTRODUCTION

In education there are several lessons taught by students, one of the lessons taught at school is mathematics. In every formal education, mathematics is a mandatory subject studied by all students at every level, both from basic education which includes SD/MI, junior secondary education which includes SMP/MTS, senior secondary education which includes SMA/SMK/MA, and education. College. Mathematics plays an important role, mathematics is used by everyone as a means of solving problems in everyday life. According to Susanto (2016:185) mathematics is a scientific discipline that can improve thinking and argumentation skills, contribute to solving daily problems and in the world

of work, as well as providing support in the development of science and technology.

In learning activities themselves there is a learning process. Learning is a process of lasting change in behavior that results from the experiences a person receives through practice or interactions. In line with Mulyasa's (2004:26) opinion, learning is essentially a process of interaction between students and their environment, so that changes in behavior occur for the better. With the learning process, students have gains from the learning process which are called learning outcomes. Learning outcomes are something that students get from the learning they have received. According to Nana Sudjana (2010:22), learning outcomes are the abilities that students have after receiving their learning experience. So it can be said that mathematics learning outcomes

The problem that the author raises in this research is about low student learning outcomes so that the average student score does not reach the KKM, namely 70. The low student learning outcomes are due to low problem-solving abilities, problem-solving ability is an indicator to determine success in the student's learning process. The ability to solve problems is really needed by students because basically students are required to try themselves to find solutions and the knowledge that accompanies problems. To obtain good learning results, the learning process must be optimized as best as possible, a learning process that is monotonous and only teacher-centered is no longer effective. The learning process is directed at students' ability to search for information. Research result Tambunan, H. (2020) Based on data analysis through analysis of covariant, the results obtained that learning with heuristic strategies are better than conventional approaches to students' ability to solve mathematical problems.

The mathematics learning process implemented at school, one form of student problem is related to solving story problems. This is because, in solving problems in the form of story questions, students are required to try to find solutions themselves by finding plans and various solution strategies that they master. And in mathematics lessons in class V, there is more emphasis on mastering the material so that it can be finished quickly. This condition of low learning outcomes obtained by students can occur because students have difficulty in learning and do not like mathematics lessons, perhaps caused by monotonous and less effective learning strategies, then students in understanding mathematics in story problems, which leads to situations and conditions that are not good at all. At the moment.

Then there are also factors that influence students' low learning outcomes, namely, in general there are two factors that influence students' mathematics learning outcomes, namely factors that come from within the student (internal factors), and factors that come from outside the student (external factors). Internal factors are factors that influence students within themselves, such as: based on the results of interviews with the fifth grade homeroom teacher at the school, problems that occur in mathematics classes, student activity is still relatively low, students do not pay attention seriously when the lesson starts, students also lack careful when working on questions, students are less active in the learning process, and the level of student mastery. Zulfah, Z. (2017) Problem solving skills for students called the Heuristic approach.

In semester 1, the material taught in mathematics lessons is taught using direct learning, namely the lecture method and carrying out learning activities based only on what the teacher teaches. Only a few students asked or responded to the teacher's questions or statements. Therefore, researchers want to apply a heuristic learning strategy as an alternative learning method that has never been used and which can stimulate student activity in optimizing students' abilities in solving story problems through sequential stages and correcting problems that cause low student mathematics learning outcomes. Scoenfeld, Alan H. (1980) "Heuristic will be used here to mean a general suggestion or strategy, independent of any particular topic or subject matter, that helps problem solver approach and understand a problem and efficiently marshal their resources to solve it. Heuristic learning strategy is a process of learning activities that emphasizes students to move independently in finding and solving a given problem. Donevska-Todorova, A., & Lieban, D. (2021), Hänze, M., & Leiss, D. (2022) It is evocative to investigate which students' general and subject-specific heuristic strategies in geometry

problem solving can be identified when connecting diverse types of resources. Witzel, B., & Myers, J. A. (2023) When problems have an infinite number of possible approaches, providing a heuristic narrows the approach to be more manageable.

The application of appropriate learning strategies in learning is expected to provide opportunities for students to play an active role in the learning process, making it easier for students to understand the material. When solving debit meter story questions, students must complete the story questions using the correct procedure or steps for solving them. Story problems are mathematical problems that are expressed or expressed in sentences in the form of stories that are related to everyday life. Discharge is a unit of volume divided by a unit of time. This is in line with the Big Indonesian Dictionary which states that discharge is the volume of water that flows from a channel through a certain cross-section in a unit of time.

Based on the description above, the author is interested in implementing heuristic learning strategies in improving the mathematics learning outcomes of fifth grade students at SD Negeri 06 Satai C. This strategy was chosen because the process of students' acceptance of the lesson will be more impressive in depth. Students will also more easily understand the subject matter because in the learning process students not only listen but also play a role in the learning process. In this way, students' attention can be focused and it is hoped that students' mathematics learning outcomes will improve.

METHOD

The type of research used in this research is quantitative research. The research design used in this research is a quasi experimental design (quasi experiment). The form of quasi-experimental design used by researchers is one group pretest-posttest. This research was conducted at SD Negeri 06 Satai C, which is an elementary school whose address is Jln. A. Yani No. 14, Bukit Mulya Village, Subah District, Sambas Regency, West Kalimantan Province. This research was carried out in the first/odd semester of the 2022/2023 academic year. The population in this study was class V students at SD Negeri 06 Satai C, totaling 24 students. The class that will be used as a sample is class V where there is only one class with 24 students. Data collection techniques and instruments used include direct observation techniques by observing student learning activities and measurement techniques by providing test questions. The data analysis technique used in this research is quantitative and statistical analysis using N-Gain.

RESULTS AND DISCUSSIONS

This research was carried out in mathematics learning in class V of SD Negeri 06 Satai C on debit material. The research results were obtained in the form of a collection of data based on research that has been carried out. The data obtained in this research are tests of students' mathematics learning outcomes, and the results of observations of student learning activities. Based on the calculation of pre-test data and post-test data obtained by the experimental class, the average value, amount of data, standard deviation, variance and S were obtained. For complete details, see table 1. as follows.

Table 1. Results of Pretest and Posttest Data Calculation for Experimental Class

| Student | Experimental Class | |
|--------------------|--------------------|-----------------|
| | <i>Pretest</i> | <i>Posttest</i> |
| Average | 62,083 | 74,166 |
| Amount of data | 24 | 24 |
| Standard deviation | 9,458 | 12,630 |
| Variance (s^2) | 89,471 | 159,536 |
| S | 83,743 | 150,888 |

Based on Table 1., it is known that the experimental class pre-test results show that the average value is 62,083, while the experimental class post-test results show that the average value is 74,166. To determine the increase in students' mathematics learning outcomes using heuristic learning strategies in class V of SD Negeri 06 Satai C, use the N-Gain formula. As for the test of improving students' mathematics learning outcomes, the data obtained from the students' pretest and posttest results were in the form of tests on students' mathematics learning outcomes from classes given heuristic learning strategies, namely the pre-test score was 62,083, the post-test score was 74,166 with a maximum score of 100 so $N\text{-Gain} = 0,318$ with medium criteria with a range of $0,3 N \text{ gain} < 0,7$. Based on the calculations above, it shows that there is an increase in the mathematics learning outcomes of students who are given heuristic learning strategy treatment in class V of SD Negeri 06 Satai C.

The results of this research support previous research that heuristic learning strategies can improve students' mathematics learning outcomes. There are many learning strategies that teachers can use to achieve the learning process, one of which is the heuristic learning strategy. Heuristic strategy is a learning activity process that emphasizes students to move independently in finding and solving a given problem. Heuristic strategies can be utilized well by teachers in carrying out learning activities and make great progress towards experiencing attitudes, values and behavior that enable students to actively participate in learning activities.

This heuristic strategy has advantages, including that students can participate actively in learning, foster and instill an inquiry attitude (search and find), support students' problem solving abilities, and the material studied can reach a high level of ability and last longer because students are involved in the process. his discovery. This is in line with the results of research conducted by IWP, Yuda (2013), concluded that there was a significant influence on learning outcomes between students who were taught by applying heuristic learning strategies.

Sudiono (2006) concluding that the application of heuristic strategies provides positive results in increasing students' magnetic force learning achievement. And this is also in line with the results of research conducted by Mega, S, et al (2013), concluding that implementing this learning strategy can increase the achievement of class average scores. To see the results of mathematics learning reaching the KKM individually by implementing heuristic learning strategies in class V of SD Negeri 06 Satai C using the one sample t-test formula. However, beforehand, a normality test will be carried out. The results of the calculation of the data normality test in the experimental class are 6.355 and 7.81472. Because \leq is $6.355 \leq 7.81472$ then it is normally distributed. Based on the normality test, it was found that the experimental class post-test data was normally distributed, so to test the similarity of class averages using the one sample t-test data test. The calculation results of the one sample t-test are known to be $= 5.915830837$ and $= 2.01063$, obtained $= 5.915830837$ 2.01063 , so it is accepted and rejected. So it can be concluded that the average completion of mathematics learning outcomes for individual students reaches the KKM. Because the average student reaches the KKM.

Based on the results of students' mathematics learning completeness, it was found that the students' mathematics learning results in the experimental class achieved individual learning completeness. This is because the learning stages using heuristic learning strategies contribute to improving students' mathematics learning outcomes as seen from the results of the experimental class post-test scores where students have achieved the KKM score, especially at the preparation stage where students are enthusiastic about learning, enthusiastic and prepared for optimal learning, next is the preparation stage where students observe and listen with discipline to the lessons taught by the teacher, next is the training stage where students begin to discuss and work together to find solutions to problems posed by the teacher and look for information in various sources and books, group friends present the results of their discussions and ask questions to other groups, so that it is possible to formulate clearer solutions and resolve problems so that individual student learning can be completed.

There are some students who still get an average score below the KKM, this is because the students do not pay attention to the teacher's explanations and are unable to cooperate which results in them not being able to work on the questions given by the teacher. Conditions like this make teachers have to use appropriate learning strategies. Nur'aini, S. (2022) Heuristic learning is an effort to realize learning activities that are conducive, effective, and efficient, namely students feel happy to learn, and there is active interaction between students and teachers, and between students and students. This means the average score for student learning outcomes in the experimental class higher than the control class. And in line with the results of research conducted by Hanum, F. D. (2022) It was concluded that the application of heuristic learning strategies in class VIII C of Al-Yasini Superior Middle School, Pasuruan, could improve the ability to solve story problems.

To find out whether students' learning activities are classified as good in debit material when heuristic learning strategies are applied in class V of SD Negeri 06 Satai C using observation sheets. Observation sheets are used to determine student activities during learning using heuristic learning strategies. Observations were carried out during two meetings carried out by 2 observers, the percentage of observations of student learning activities during two meetings. From the data on the percentage of student learning activities, the average obtained from six categories of observations, two meetings and two observers, was 85%. This shows that students' learning activities during ongoing learning are in the very active category. Thus, it can be concluded that student learning activities are classified as good in learning debit material using heuristic learning strategies. Based on data analysis from observations of student learning activities, it was found that each indicator of student learning activity was in the good category. This is because learning using heuristic learning strategies is able to make students active during the learning process. Lidinillah, D. A. M. (2011) Heuristics can be referred to as general strategies that are not related to the subject matter that help problem solvers in their efforts to approach and understand problems and use their abilities to find solutions to problems. This can be seen from the results of observations on student learning activities which were observed at the stage that each group was given the task of studying one topic of material, then working on it for another group. At this stage students were given problems through observing phenomena, from observing these phenomena students were asked to make pictures. (drawing activities) and create a solution to the problem (writing activities), then explain to other groups. At this stage students pay attention and listen to the explanations of other groups (visual activities and listening activities).

In learning, learning process activities are very necessary. Active learning is a development of the theory of learning by doing (Siregar and Nara, 2010). This is supported by the results of research conducted by Krisnawati (2012) that learning mathematics by implementing heuristic learning strategies can increase the active mathematics learning of class V students. This can be seen from the achievement of indicators of active mathematics learning. And this is also in line with the results of research conducted by Dewi Pramita and Muh. Rusmayadi (2018), concluded that in the heuristic learning strategy in the problem solving approach, students are given the opportunity to be active in the discovery process so as to gain a deep understanding.

CONCLUSION AND SUGGESTION

Based on the results of research data processing and general discussion, it can be concluded that the heuristic learning strategy can provide an increase in student learning outcomes in class V debit material at SD Negeri 06 Satai C. In accordance with the sub-sub formulation of the research problem, in particular it can be concluded that as follows. There is an increase in students' mathematics learning outcomes using the heuristic learning strategy in class V of SD Negeri 06 Satai C. Students' mathematics learning outcomes reach the KKM individually by implementing the heuristic learning strategy in class V of SD Negeri 06 Satai C. Student

learning activities are classified as good in debit material when the strategy is applied heuristic learning in class V SD Negeri 06 Satai C.

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