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IMPROVED PROBLEM SOLVING SKILLS SLOW LEARNER STUDENTS IN ELEMENTARY SCHOOL THROUGH THE USE OF CONSTRUCTIVISM LEARNING MODEL

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Abstract

The purpose of this study is to study the improvement of problem-solving skills of elementary students who fall into the category of slow learners who apply to learn using constructivism and conventional learning models. Researchers processed data using the SPSS 16 for Windows and Microsoft Office Excel 2007 programs to achieve these goals. The subjects in this study were students of slow learner class V Adabiah Padang Elementary School. Data collection techniques with observations and interviews with observation and interview guidelines. The results showed that through pre-test and post-test problem-solving skills at the end of learning using the Constructivism Learning Model and conventional learning. The problem-solving skills test data were obtained from 16 students, 8 experimental class students applying the Constructivism Learning Model, and 8 control class students who applied conventional learning. The problem-solving skills test data were obtained from 16 students, 8 experimental class students applying the Constructivism Learning Model, and 8 control class students who applied conventional learning. The application of this learning model occurs an increase in problem-solving skills, including understanding problem planning for problem-solving in the form of problem-solving from the application of several mathematical learning concepts. The evidence from data on normalized gain scores (N-gain) between the two classes may be seen.

Keywords: Constructivism, problem solving, slow learner.

Abstrak

Tujuan penelitian ini adalah untuk mempelajari peningkatan kemampuan pemecahan masalah siswa SD yang termasuk dalam kategori lambat belajar yang menerapkan pembelajaran dengan menggunakan model pembelajaran konstruktivisme dan konvensional. Peneliti mengolah data menggunakan program SPSS 16 for Windows dan Microsoft Office Excel 2007 untuk mencapai tujuan tersebut. Subjek dalam penelitian ini adalah siswa slow learner kelas V SDN Adabiah Padang. Teknik pengumpulan data dengan observasi dan wawancara dengan pedoman observasi dan wawancara. Hasil penelitian menunjukkan bahwa melalui pre-test dan post-test keterampilan pemecahan masalah pada akhir pembelajaran menggunakan Model Pembelajaran Konstruktivisme dan pembelajaran konvensional. Data tes keterampilan pemecahan masalah diperoleh dari 16 siswa, 8 siswa kelas eksperimen yang menerapkan Model Pembelajaran Konstruktivisme, dan 8 siswa kelas kontrol yang menerapkan pembelajaran konvensional. Data tes keterampilan pemecahan masalah diperoleh dari 16 siswa, 8 siswa kelas eksperimen yang menerapkan Model Pembelajaran Konstruktivisme, dan 8 siswa kelas kontrol yang menerapkan pembelajaran konvensional. Penerapan model pembelajaran ini terjadi peningkatan keterampilan pemecahan masalah, termasuk pemahaman perencanaan masalah untuk pemecahan masalah berupa pemecahan masalah dari penerapan beberapa konsep pembelajaran matematika. Bukti dari data skor gain yang dinormalisasi (N-gain) antara kedua kelas dapat dilihat.

***Kata Kunci**: Konstruktivisme, Pembelajar Lamban, Pemecahan Masalah.*

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INTRODUCTION

Mathematics is needed to be able to think logically and work with friends in class. Mathematics learning can develop students' abilities including (1) understanding in the mathematical foundation; (2) the use of reasoning patterns; (3) problem solving includes solving problems of mathematical design funds; (4) being able to communicate through tables and diagrams; (5) have an appreciation for low-ability mathematics learning for problem-solving caused by several aspects, namely learning models that are used inappropriately, students' interest in learning, and passive learning. Students who have intelligence are below normal children (Triani, 2013).

Human intelligence in the ability to solve problems funds to find the connection to existing problems, as well as being able to adapt and combine several theories so as to find newness. It can be mentioned that the level of intelligence can be used as a parameter and the standard is known as assessment (AL Muntasirin, 2019; DAI & ZHENG, 2019; Kurniati et al., 2017).

The basic principle of the constructivism learning model teacher not only provide knowledge but build the pieces of knowledge themselves in the minds of students. Teachers can young provide opportunities for students to implement their ideas and ideas during the learning process. In addition, teachers become intermediaries to provide more understanding to understand learning (Trianto, 2007). Another opinion states that the cognitive aspects of children can develop by the child's ability to build different insights based on the maturity of intelligence in children(Akpan, Joseph; Beard, 2016; Gülpinar, 2005; Siregar, 2018).

Another understanding is reinforced by Triani, they explained that students who have intelligence are below normal children (Triani, 2013).The characteristic of slow learning students is a delay in thinking in the learning process. Other research suggests that learning delays are caused by gene factors(Amdany, Pratia; Sularmi; Sriyanto, 2018; Hartini, Ayu; Widyaningtyas, Dessy; Mashluhah, 2017). It can be said that the slowness of learning students can not only be determined from the level of intelligence but from the level of the child's ability to absorb learning. From all aspects can be concluded some of the opinions above, namely slow learner students with normal students there is a difference lies in the delay of those who have slow learning not only bias determined from delays in learning absorption. The characteristics of motor visual problems include (1) slow learners more lancer receiving stimuli in visual form; (2) limitations in understanding color, size, and shape and limitations in remembering; (3) limitations of ability to write and physical limitations that have an impact on the body's pain.

The target of mathematics learning requires special attention to improve student learning outcomes and learning results can improve. Mathematics learning also studied in elementary school includes arithmetics, algebra, and geometry taken based on the school curriculum. Mathematics is difficult to learn because it has obstacles to achieving good learning outcomes (Mulyadi, 2010).

The parameters of learning difficulties above can be concluded that learning difficulties and do not have learning achievements due to learning obstacles. Based on the opinion of Yeni,

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Fauzi, Arisetyawan stated that the weakness of learning difficulties refers to meaning and geometry (Delyana et al., 2018; Febriana et al., 2020; Listanti et al., 2020). Learning difficulties can be categorized into difficulty understanding concepts, applying concepts, and problem-solving.

This learning difficulty can be overcome by problem-solving can help students understand the learning material. Problem-solving can be direct learning so that slow learner students can respond well to all problems faced (Amdany, Pratia; Sularmi; Sriyanto, 2018; Hartini, Ayu; Widyaningtyas, Dessy; Mashluhah, 2017; Susanto, 2013). Problem-solving is a method of thinking because problem-solving can relate to another method. It makes it easier to conclude. Therefore problem-solving is designed to improve the mindset of students so that they can consciously find solutions(Amdany, Pratia; Sularmi; Sriyanto, 2018; Hadi, 2016).

Polya mentions there are four procedures in problem-solving learning (Polya, 2004)

a. Understanding of problems,
b. Management planning
c. Calculations
d. The examination of the results

Based on the four problem-solving learning procedures above slow learner students can only complete one of the four existing procedures. Appears on Mathematical problem-solving skills seen in slow learner students (Linda, Mey Yeci; Jusra, 2021) explain that the mathematical problem-solving skills of slow learners group in a range of enough to low. This mathematical problem-solving influences the difficulty in absorbing mathematical learning materials.

The supporting research on these four problem-solving learning procedures developed by Daulay and Ruhaimah describes Polya Theory to Improve Problem-Solving Skills. Mathematical problem solving proved to increase when the application of Polya's theory. The increase can be seen from the results of percentage achievements based on cycle I and cycle II (Daulay; Ruhaimah, 2019).

It is evident from several studies to have a positive impact after using a constructivism approach to solving mathematics problems (Jatisunda, 2017; Kartikaningtyas et al., 2018). Students' math problem-solving skills have seen significant improvements in understanding learning materials.

The constructivism learning model is more effective than the direct learning model. This learning model gives rise to cognitive conflicts. Cognitive conflicts overcome to connecting knowledge and experience in learning (Mohiddin, 2016). Siregar discussed constructivism's approach to students' mathematical problem-solving skills at SMP Negeri 5 Sipirok. The constructivism approach can categorize as good because obtaining a higher posttest score than pretest. To increase mathematical problem-solving skills higher than posts it can categorize as good. It can say that there is an effect of the relationship of constructivism approach to mathematical problem-solving ability (Siregar, 2018).

RESEARCH METHODS

The research uses classroom action research that can develop proficiency in practice. This research was conducted to improve the problem-solving skills of slow learner students in elementary school. This study uses the discipline inquiry method in collecting

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data that focuses on the object studied. This research object takes from students in class V of Adabiah Elementary School, Padang, West Sumatra. A research sample of 16 students and use of instruments was used based on observation sheets. The observation sheet is obtained from the observations of researchers of phenomena that are studied directly and produced, namely using observes standards. Next, using the test by providing several questions that are used as parameters to find the level of intelligence of slow learner students can be done through the constructivism learning model through problem-solving skills.

Data collection is done by testing learning results so that they can find out the condition of student learning outcomes. The learning results in question are determined based on KKM with an average score of 60 in mathematics subjects with a maximum score limit of 100. KKM presentations are calculated based on percentage techniques.

Here are the stages of enforcement in class action research. Here are some explanations

a. Planning
   Planning is done through observation in the learning process. This activity is done to identify problems. Planning is carried out beginning with (a) obtaining permission from the Principal and teachers to support this Research; (b) observations are carried out by obtaining initial descriptions of teaching and learning activities; (c) analysing scheduled learning in mathematics learning; (d) analyze material in mathematics learning; (f) design rpp
b. Enforcement
   Enforcement carries out through planning formulated on planning. It aims to optimize student creativity in the learning process.
c. Observation
   Observations carry out to obtain the results of a description of the learning process to see the condition of the classroom
d. Reflection
   The standards of this Stage collects based on preparation in implementation. Thus it can find information by reflecting on the crackdown in the learning process.

The process of collecting data is required from the provision of mathematical learning materials based on predetermined curricula, the preparation of research instruments by the learning materials, and the preparation of observation sheets. Furthermore, the implementation stage is carried out through tests by knowing the learning outcomes of students through direct observation results in the learning process.

An analysis carries out to analyse class actions by combining quantitative and quantitative methods. Quantitative data sources from the results of observations and test results are described based on research enforcement tapa until the discussion result. The discussion results are obtaines from a collection of data from observation sheets which identify and group. The analysis results are validated based on the instrument through comparison of previous research results and rechecking the analysis of the results to provide grateful analysis results.

RESULT AND DISCUSSION

The research was conducted on slow learners of class V of Adabiah Elementary School, Padang, West

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Sumatra. The results of observations make to describe the behaviour to participate in learning. Things categorize into three parts, namely good, medium, and not good. Enforcement of student behaviour and attention based on observations. Good attention done to students in learning can be grouped as a good group, students who focus on learning but are not actively participating can groupe moderately, while students who do not pay attention to the lesson and actively participate are grouped not.

The observation results showed that slow learners of mathematics learning focus on providing learning materials. It is proof that all learning materials are centred on so that the results obtained are less than optimal. If you only rely on teachers in the class in providing learning materials, the learning target will not achieve, so the learning results obtained to not achieve by KKM.

At the enforcement stage, research was conducted pre-test on students of class V of Adabiah Elementary School, Padang West Sumatra to describe the level of intelligence of slow learner students to find problem-solving in mathematics subjects. The results of this study are followed by the results of pretests and post-test as follows. The description of the pretest, posttest, and N-gain data in the control and experimental groups can be seen in Table 1.

Table 1.Descriptive Statistics of Pretes and Postes Problem-solving ability

Value	Control				Experiment			
	N	X_{min}	X_{maks}	$\bar{x}$	N	X_{min}	X_{maks}	$\bar{x}$
Pretest	8	30,82	65,26	46,00	8	42,26	70,44	54,52
Postest	8	42,62	90,75	66,32	8	70,64	93,75	83,48
Ideal Maximum Score = 100								

Table 1 the statistical results describe descriptively increased from the experimental class to 83.48 while the control class slightly increased to 66.32. The result of this reflection is a revision of the quality of mathematics learning. The results of the control class can be grouped in the medium category because it does not give treatment, while in the experiment class it is categorized as good because it achieves maximum results and gives treatment. Learning application of constructivism Learning Model

a. First Cycle Enforcement

1. Planning: done by Planning with the preparation of RPP containing mathematical learning materials
2. Implementation: implementation is carried out by giving students questions and students are expected to respond to the initial knowledge given by the teacher about mathematics learning materials about distance time and speed. The teacher provides the material by describing the difference in time, distance, and speed then gives examples of problems to students by dividing students into the form of groups. Group division is done so that students can solve problems easily. Thus students can construct insights based on problems found in questions about time, distance, and speed. When discussing with group members, the teacher assigns responsibility to each group to participate in finding answers as a form of problem-solving is found.

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Each group was given time to present the results of their discussions about the differences in time, distance, and speed. Some groups may advise on the results of group presentations that have been appointed by teachers in front of the class. In the results of group discussions, it is expected to students by explaining the importance of the existence of time, distance, and speed to provide new knowledge and knowledge that has been formed by teachers before evaluating the assessment.

The results of the mathematical learning crackdown on time, distance, and speed by introducing a constructive learning model, can be carried out the analysis of reflection results following the results of observations in the learning process

(a) Mathematics learning by applying the constructivism learning model has increased learning outcomes in slow learner children but not yet significant because not all group members participate in the group to solve examples of problems about time, distance, and speed in front of the class when they present the results of their presentation.
(b) Irregularity of slow learner students to give the right answer according to the example of the problem given by the teacher on the board.
(c) Irregularities appear to be in the supervision of the number of students participating in their respective groups
(d) The evaluation of the assessment has not been achieved properly because the results of the evaluation have not been fully carried out to be followed up on the next planning

b. Cycle planning 2

At this stage, it is done to perfect the previous stage where not all slow learner students participate in finding the right answer to the problem given by the teacher. The revision to the previous stage is

1. Rpp Manufacturing
2. Change the learning method if not all students participate in the group
3. The results of the evaluation of the assessment of the group that has not given the right answer, then given time to work and overcome it by discussing with group members. Therefore, teachers can encourage slow learner students to be able to follow learning by solving the questions given.
4. Pursuing learning through the application of constructivism learning models can be seen from student learning outcomes
5. Creating a calibrated question so that students can easily understand the answer

c. Enforcement Planning

The planning of the second crackdown is carried out from the results of the reflection of the first crackdown on the results of the analysis of the initial description of the data obtained. Learning outcomes are revised continuously

d. Implementation of the crackdown

The standard of implementation of the implementation of stage 2 is the enforcement in the first stage. The implementation is carried out at the beginning by providing several matches so that students can inform the initial knowledge they have. The teacher informs the learning material. Then students give responses in the form of questions. At this stage, students'

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answers are not required to be correct, in essence, they can participate in answering based on questions from teachers. The teacher becomes a mediator to direct students to give the right answer based on the questions given by the teacher. This is done by teachers to achieve learning targets. Early activities encourage students to be able to focus on receiving learning materials. Then teachers can share examples of vehicles that represent time, distance, and speed. At the end of the activity, an evaluation is carried out to students to describe learning targets.

The next meeting is given the material on the root rank to perfect and evaluate the understanding of sloe learner students. Here are some things to watch out for

a. Identify the student's initial description related to the previously studied root stage
b. Learning focuses on the learning conditions of students.
c. Activities using real tools so that they can also be done with pictures

The comparison of the average data of pretest scores, postest, and N-gain Student problem-solving ability can be seen in Table 2.

Table 2. Average pretes, postes, and n-gain scoresproblem-solving ability

Group	Pretest	Postest	N-*gain*
Control	46,00	54,52	0,33
Experiment	66,32	83,48	0,64

Based on the table 2, it is known that the average control class is lower than the experimental class both before being given treatment and after being treated. However, the increase after treatment will look higher when measured by N-gain. N-gain student problem-solving skills can say in the Figure 1.

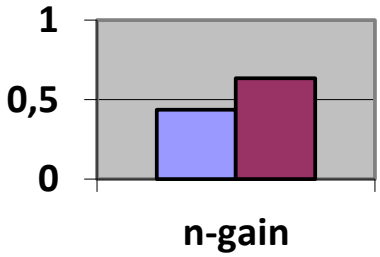

Figure 1. N-*gain* troubleshooting ability

The figure above shows a higher improvement in the improvement of students' problem-solving ability after treatment, which means that the average postest of experimental classes applying the Constructivism Learning Model showed higher improvements in results than control classes that applied conventional learning.

Table 3. Average value of solving each problem students in experimental class

No	Code	Pretest Average	Postest Average
1	ZN	75	80
2	IG	66	86
3	FH	62	85
4	NN	60	88
5	MF	70	78
6	AF	70	84
7	AA	60	86
8	GR	68	80

Table 3 shows that post-test score results increased when compared to post-test scores for slow learner students. This is obtained based on the support and stages provided by the teacher. Treatment in the form of a constructivism learning model resulting from the average score of slow learner students has not increased significantly. However, the average score of slow learner students increases from 60 to 80 after being given treatment. The achievement of the results of this score

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has been successfully improved based on the application of mathematics learning with a constructivism learning model.

After the application of the constructivism learning model, the implementation of the analysis results is explaines as follows.

a. Learning goes according to expectations
b. Through the revision of the crackdown that has a significant impact on student learning outcomes

Based on the results of the implementation of the first stage and the second stage carried out with a constructivism learning model, students understand the material and become confident in front of the class. Every aspects of slow learner students' increase can be seen in Table 4.

Table 4. Aspect of slow learner students increases

No	Assessment Aspects	Targets achieved		
		Pre-cycle	First stage (pretest)	Second stage (posttest)
1.	Troubleshooting	50	80	84
2.	Confident	62	81	83
3.	Motivation	45	82	85
4.	Communication	64	84	86
5.	Effective	62	83	87
6.	Innovative	63	82	85
7.	Creative	61	85	88
8.	Responsive	64	84	86

Table 4 above shows that the assessment aspect of slow learner students increases assisted by teachers in each stage. The results of teacher observation of learning to carry out conception, group making, preparing props, preparing LKS. In the next stage, the teacher explains the learning material, presents using props, encourages students to actively ask questions, teachers give practice questions, and gives gifts to groups/individuals who can answer appropriately and correctly.

Before the application of mathematics learning with a constructivism learning model, the results of student assessment evaluations seemed less good. This is seen in the results of the pretest score in the control class of slow learner students 30, 82 maximum reaching 65.26 to increase after the pretest results increased from 42.62 to 90.75. This result reaches KKM even though the results are groupe less well. After applying the constructivism learning model showed a significant improvement in learning outcomes in the experimental class of slow learner students from 42.26 to 70.44 after treatment in the form of the application of the consumerism learning model from 70, 64 to 93.75. The application of this model has an impact on changes in student motivation slow learners so that two-way interaction between students and teachers becomes more effective to provide learning materials. Learning mathematics was initially assumed to be

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saturated but with the application of constructivism, learning models can become easier for students to understand learning(Akpan, Joseph; Beard, 2016; Mohiddin, 2016; Siregar, 2018).

In contrast to (Amdany, Pratia; Sularmi; Sriyanto, 2018; Hadi, 2016)discussed strategic learning for slow learners using the project-based learning mode in primary school. (Ellis & Goodyear, 2016; Hadi, 2016) have similar objects to those studied with this research, namely slow learner students but using a different approach to the project-based learning model in Elementary School. Although using different strategies, the results obtained show that slow learner learning is measured not based on improved learning outcomes. The information obtained by slow learner students can be longer based on the experience they have gained, being able to work with other friends to reduce the delay in absorption in learning, good teacher support can increase the delay in learning absorption of slow learner students, and props can also provide stimulation to slow learner students. (Hartini, Ayu; Widyaningtyas, Dessy; Mashluhah, 2017).

The same opinion is also found in Akpan's research and Beard explained about Using Constructivist Teaching Strategies to Enhance Academic Outcomes of Students with Special Needs. The constructivism learning model focuses on students. Students as objects to build knowledge-based on social context. This knowledge is based on the experience and treatment that the teacher gave before. In addition, this model develops a level of confidence and understanding of students through problem-solving (Akpan, Joseph; Beard, 2016).

Another approach used by Surya Research, Putri, and Mukhtar describes improving mathematical problem-solving ability and self-confidence of high school students through contextual learning model. Surya, Putri, and Mukhtar's research are different from the research studied in this study using different study objects, namely normal students in class VIII of Muhammadiyah Junior High School. Although the object of study is different, the results of the research have a positive impact proven to increase student interaction with teachers when applying mathematical problem-solving strategies to students so that students' confidence levels also increase when performing in front of the class (Surya, Edy; Putri, 2017; Wurdinger & Qureshi, 2015).

The learning motivation of slow learners in elementary school. Although slow learner students have the motivation to work, special mentoring teachers are needed to provide learning services to slow learner students and teachers want to give gifts to students to realize comfortable classroom conditions so that the development of slow learner students develops well based on the social environment. (Amdany, Pratia; Sularmi; Sriyanto, 2018).

CONCLUSION AND SUGESTION

The results showed that applying constructivism learning models in mathematics learning can improve the results of student assessment evaluations from pre-cycle, stage one, and second stage. It appears that the increase was from 66.32 to 83.48. The application of this model can encourage slow learner students to be motivated and appear confident in group discussions so that mathematics

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learning that is initially saturated becomes fun and has a positive impact on the results of student assessment evaluation at each stage(Akbar et al., 2017; Yuwandra & Arnawa, 2020).

The results of pretests and postest in slow learner students after the implementation of the constructivism learning model increased at level 3 based on four problem-solving procedures, such as understanding problems, planning for problem-solving how many problems solving from the application of several mathematical learning concepts, and calculations have been examined but have not arrived at the examination of the correct answer because slow learner students need a long period to obtain and adjust the theory with the questions given by the teacher in mathematics learning.

This research provides new information about mathematical mathematical problem solving on slow learner students. Teachers can pay more attention to the slow learner student learning strategies in solving problems.

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