THE IMPLEMENTATION OF *PROBLEM BASED LEARNING MODEL* TO IMPROVE THE FIRST GRADE STUDENTS' MATHEMATICAL CONCEPT UNDERSTANDING AT SDN BABAKAN

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ABSTRACT

This research is motivated by the low ability of grade 1 students in understanding math word problems. Math story problems are a form of math problems that contain aspects of the ability to read, reason, analyze, and find solutions. This study aims to describe the Problem Based Learning model assisted by snakes and ladders game media that can be implemented to solve problems related to the low ability of students to understand story problems. This research is a qualitative research using classroom action research methods. Data were collected using in-depth interviews, observation, documentation studies, and data were analyzed qualitatively descriptively. Researchers analyzed the data by means of data reduction, data presentation, and drawing conclusions and verification. This research was conducted in two cycles. The pre-cycle percentage based on the results of the researchers' observations was only 40% of students who scored above the KKM. These results have increased quite well after the implementation of PTK. Evidenced by the results of the average percentage of students' understanding of mathematical concept in cycle I of 67% of students getting scores above the KKM. In cycle II there was an increase to 87% of students getting scores above the KKM. The data shows that students' understanding of mathematical concepts in mathematics subject matter of word problems has increased through the application of the Problem Based Learning model assisted by snakes and ladders game media.

Keywords: learning model, Problem Based Learning (PBL), snakes and ladders game media, concept understanding, story problems

INTRODUCTION

Education is a conscious planned effort to prepare students through teaching, guidance and training activities so that they can stand on their own feet in the future. Therefore, the implementation of national education needs expanding and improving especially for students, and generally for all levels of Indonesian society. Law No. 20 of 2003 Article 3 states that: National education functions to develop capabilities and shape dignified national character and civilization in the context of educating the nation's life, aiming at developing students' potential to become human beings who

believe in and fear God Almighty, have noble character, are healthy, knowledgeable, capable, creative, autonomos and become a democratic and responsible citizen.

This function is described in mathematics. The achievement of the objectives of the mathematics subject is supported by the learning process designed in the curriculum. There are two important things that must be done in teaching mathematics, namely the approach to developing teaching materials which are always associated with the community environment in educational units and problem-based learning models.

However, the expected learning objectives were not in accordance with what happened on the ground. Based on the results of observations in class I SDN Babakan, there were problems with the students' understanding of mathematical concepts in story problems. According to Budiyono in Fitriatien (2019), word problems are a form of questions that presents problems in everyday life in the form of narratives or stories. The students tend not to be able to understand the math word problems that are learned during the learning process. This causes no interaction between them in question and answer activities, be it question and answer activities between the teacher and the students or question and answer activities between the students and students while studying story problems. When the researcher gave the opportunity to the students to answer one of the questions in the math story problem, they were embarrassed, just kept silent and shook their heads. This shows that the low ability to understand math word problems can lead to a lack of self-confidence in students. Mulyono (2018) reveals that understanding concepts manifests or reflects a student's ability to provide explanations and reasons in contexts or situations that involve careful and measured application of concept definitions, relations, or their representations. Learning with understanding is fundamental and important (essential) to make students able to solve new forms of problems that they will face as needed in the future.

In addition, during mathematics learning, the students were less able to develop their thinking skills; so, they only wrote down the numbers without really understanding the meaning of the story problems. Based on the results of pre-cycle observations in class I SDN Babakan, it was obtained that a percentage of 40% of them scored above the KKM. This can be seen from the results of the evaluation assessment as follows:

Table 1. The Result of the 1st Grade Students' Mathematical Concept Understanding Assessment on Addition and Substraction Story Test Items (Pre-Cycle)

No	Name	Score	Description Graduate	Passed
1	ADY	67	√	
2	AD	60		√
3	AL	73	√	
4	AR	80	√	
5	AZ	53		√
6	DH	60		√
7	FA	53		√
8	GI	67	√	
9	HI	53		√
10	KH	67	√	
11	MA	53		√
12	ME	47		√
13	NA	60		√
14	RA	73	√	
15	SO	60		√
	Means		61,7	

Of course these problems can occur due to several factors, one of which is the inaccuracy of the learning model applied by the teacher. Conventional learning, also known as the lecture method, is less effective when applied to mathematics. This method will make learning become teacher centered.

Thus, a learning model is needed to make students understand mathematical concepts, especially in word problems, better. The learning model that can be used is the Problem Based Learning (PBL) model. Fauzia (2018) suggests that it can be used to help students understand story problems. This is because PBL model can help them associate material with real life. This is in line with Ati's opinion (2020) which suggests that it has advantages which include problem solving which is a good technique to better understand learning, stimulates and provides satisfaction to find other knowledge for students, helps them develop and take responsibility for the learning they do, learning becomes more fun, encourages them to think critically by adjusting the knowledge they have just acquired, and provides opportunities for them to experience first-hand the knowledge or problems they get in the real world. Whereas Dewi (2017) stated the shortcomings of PBL model, including: (1) Students become bored if the time for carrying out discussions is too long, (2) Students are busy alone and have difficulty controlling themselves during presentation activities, and (3) Students have difficulty processing words in giving arguments during presentations, students often still use a

mixture of regional languages and the sentence structure is irregular. In addition to using models that are adapted to the material to be taught, a teacher must also have high creativity to design learning media attractive to students. One of them is *Snakes and Ladders* game. Afifah (2019) revealed that it can be used as a learning medium in Mathematics. This is because it is a media accompanied by playing; so, it fits the characteristics of students who like to play. It is a medium that resembles snakes and ladders game, but each plot contains questions where each player must go through and answer them. In addition, Desri (2019) also revealed that its advantages are: (1) Being able to train students' attitudes to queue up when starting the shuffle/game, (2) Train their cognitive skills, (3) Motivating them to keep learning. Meanwhile Wati (2021) reveals its weaknesses, which are: (1) Requiring thorough preparation and (2) Taking too much time.

So, based on the statements regarding the low ability of grade 1 students in understanding math story problems in addition and subtraction material, one learning model that is considered appropriate is the Problem Based Learning (PBL) model assisted by Snakes and Ladders game media. Thus, this research is studied more broadly regarding the application of PBL to increase the 1st grade students' understanding of mathematical concepts at SDN Babakan.

METHOD

The method used is Classroom Action Research (CAR/PTK). According to Kemmis and Mc. Taggart (in Muslich, 2012, p.8), suggests that it is a study conducted to improve oneself, one's own work experience, carried out in a systematic, planned, and introspective manner. This is in line with what was revealed by Susilo (2022, p.1) that it is defined as a controlled investigative process that is recyclable and self-reflective carried out by teachers/prospective teachers who have the aim of making improvements to the system, work methods, process, content, competency, or learning situation. Meanwhile, according to Sugiarni (2021), the stages of class action research consist of several cycles. Each cycle consists of four steps, namely: (1) planning, (2) action or action, (3) observation, and (4) reflection.

This research was conducted at SDN Babakan in October 2022. The subjects were 15 1st students in the odd semester of 2022-2023 academic year; consisting of 7 females and 8 males. The instrument was an assessment of understanding of mathematical

concepts in the form of an evaluation sheet test. The instruments were used to collect data which is qualitative analysis. Data collection used qualitative analysis based on the results of observations during the learning process. Then, the written test/evaluation sheet that the researchers made was used as a reference for the success rate of the research which would later be described descriptively. The procedure used in this classroom action research was a form of cyclical assessment which consists of four stages; namely planning, action, observation, and reflection. The implementation of this classroom action research consisted of two cycles.

RESULTS AND DISCUSSIONS
Results

The implementation CAR conducted in class I SDN Babakan can be said to be successful. Students' understanding of mathematical concepts between cycle I and cycle II experienced a significant increase. This can be proven by the results of the assessment of their evaluation sheets that get scores above the KKM which have increased in each cycle. The following is an explanation regarding the results of assessing students' understanding of mathematical concepts in cycle I and cycle II.
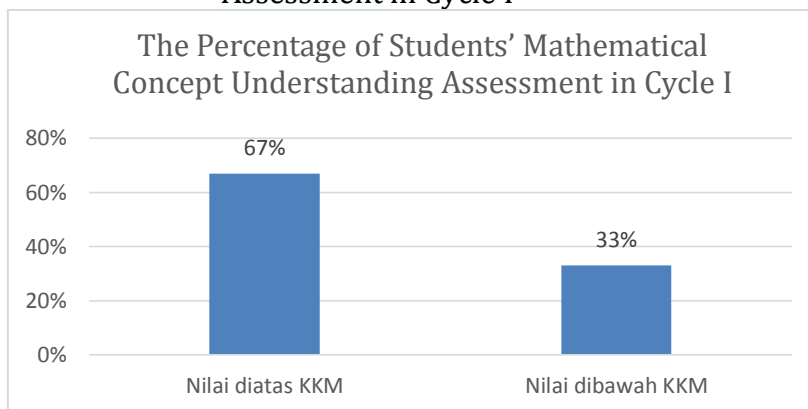
Table 2. The Result of the 1st Grade Students' Mathematical Concept Understanding Assessment on Addition and Substraction Story Test Items (Cycle 1)

No	Name	Score	Description	
			Graduate	Passed
1	ADY	73	√	
2	AD	73	√	
3	AL	73	√	
4	AR	80	√	
5	AZ	53		√
6	DH	73	√	
7	FA	53		√
8	GI	80	√	
9	HI	53		√
10	KH	73	√	
11	MA	80	√	
12	ME	47		√
13	NA	73	√	
14	RA	87	√	
15	SO	60		√
	Means		68,7	

In the implementation of learning cycle I, the mean score obtained by the students in the evaluation assessment was 68.7. During the implementation of cycle I

there were still some of them who did not really understand the work on math story problems. For more details, the following is a graph of the students' achievement of scores that have reached above the KKM.

Graph 1. The Percentage of Students' Mathematical Concept Understanding Assessment in Cycle I

The Percentage of Students' Mathematical Concept Understanding Assessment in Cycle I

	Nilai diatas KKM	Nilai dibawah KKM
	67%	33%

Based on these percentages, it can be said that as many as 67% of students had scored above the KKM, and as many as 33% of students have scored below the KKM. Due to the achievement of the percentage of students who scored above the KKM only reached 67%, the research was continued in cycle II.

Table 3. The Result of the 1st Grade Students' Mathematical Concept Understanding Assessment on Addition and Substraction Story Test Items (Cycle 2)

No	Name	Score	Description	
			Graduate	Passed
1	ADY	80	√	
2	AD	87	√	
3	AL	73	√	
4	AR	100	√	
5	AZ	60		√
6	DH	73	√	
7	FA	80	√	
8	GI	93	√	
9	HI	60		√
10	KH	87	√	
11	MA	80	√	
12	ME	53		√
13	NA	93	√	
14	RA	93	√	
15	SO	100	√	
	The Means		80,8	

In the implementation of learning cycle II, the mean score obtained by the students in the evaluation assessment is 80.8. During the implementation of cycle II

there were only a small number of them who did not really understand the work on math story problems. For more details, the following is a graph of the achievement of student scores that have reached above the KKM:

Graph 2. The Percentage of Students' Mathematical Concept Understanding Assessment in Cycle 2
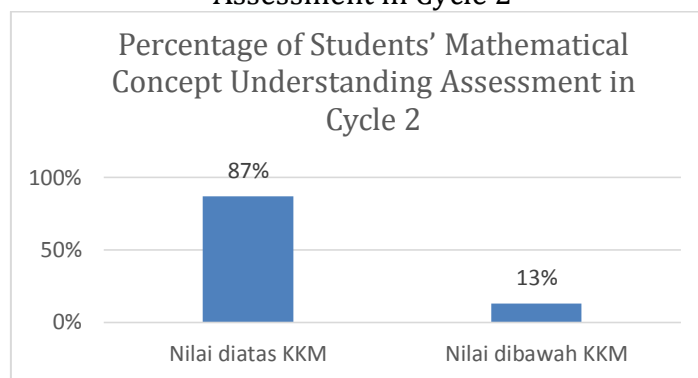
Based on these percentages, it can be said that as many as 87% of students had scored above the KKM, and only 13% of students had scored below the KKM. Because the percentage of those who scored above the KKM reached 87%, the research only lasted until cycle II. In the following, the researcher attaches a graph comparing the percentage of students' passing in understanding mathematical concepts from pre-cycle, cycle I, to cycle II.

Graph 3. The Comparison of the Students' Pass-Grade Percentage in Mathematical Concept Understanding
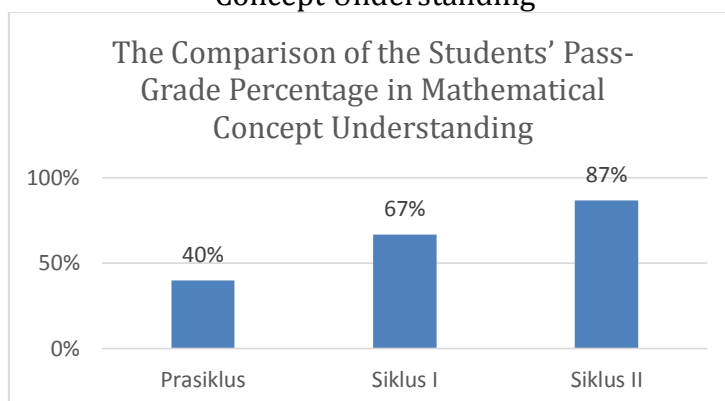
Discussions

Based on the results of the research that has been done, it can be said that the Problem Based Learning (PBL) model assisted by the Snakes and Ladders game media can improve students' conceptual understanding related to math story test items. This is evidenced by the results of student evaluation assessments which increase in each

cycle. This is in line with the results of Priyatni's research (2019) which shows the results that elementary school students' understanding of mathematical concepts increases when learning is carried out using the Problem Based Learning (PBL) model.

Meanwhile, during pre-cycle activities, most of the students were unable to understand the concept of math word problems presented by the researcher. They tend to only write down the numbers contained in word problems without really understanding what sentences are known and asked in these story problems. The factors that influence it are the use of learning models that are not in accordance with the material being studied, the inaccuracy of the media used to support the success of the learning process, so that students are rarely given the opportunity to practice working on math story problems. Salam (2017) stated that learning models can determine the level of effectiveness of learning, learning activities and student learning outcomes. The more appropriate the selection of learning models, it is hoped that learning will be more effective in achieving learning objectives. Thus, the selection of learning models and media is an important concern for researchers in carrying out this research.

In the first cycle, after the implementation of PBL assisted by snakes and ladders, the students begin to be enthusiastic and enthusiastic in participating in learning. This is because PBL is able to create a students-centered learning atmosphere. Thus, they contribute actively in solving problems that occur in word problems. In line with this, Monica (2019) also revealed that PBL is a learning model that encourages students to be more active in developing a problem-solving ability and is able to try to find solutions to real-world problems. Using the right learning model in cycle I, they are able to find sentences that are known and sentences that are asked in the story questions. However, they have not been able to determine the purpose of the word problems included in addition or subtraction questions.

Furthermore, in cycle II, after obtaining data related to things that need to be repaired and perfected, the researcher provides additional duration during strengthening activities in practicing word problems through the snakes and ladders game media. This is because the snake and ladder game media used by the researchers makes the students feel like they are playing. This is in line with what was revealed by Pujianto (2020) that the snakes and ladders game media can be used in the learning process because this activity is fun so that students are interested in learning while

playing, besides that the snakes and ladders game can arouse student learning motivation, because they can learn while playing. Thus, when students often practice working on math word problems, it will also be easier for students to understand the meaning of the sentences from the word problems given. It is evident that in cycle II most students were able to understand and work on math word problems correctly.

Thus, the implication of the results of the research that has been done is that this research can become a reference for educators and education staff to be able to design problem-based learning to achieve more student-centered learning. With hope, the quality of education in Indonesia can increase.

CONCLUSION

In general, it can be concluded from this study that the understanding of mathematical concepts for grade I students at SDN Babakan can be increased by applying the Problem Based Learning (PBL) model assisted by snakes and ladders game media. The Problem Based Learning (PBL) model is able to make students actively involved during learning because learning is problem based. Then the snake ladder game media was able to increase the enthusiasm and enthusiasm of students to take part in learning. The success of the Problem Based Learning (PBL) model assisted by the snakes and ladders game media can be seen in the percentage of students' mathematical concept understanding assessment results in cycle I of 67% of students getting scores above the KKM. Then in cycle II it increased to 87% of students getting scores above the KKM. This confirms that the Problem Based Learning (PBL) model assisted by snakes and ladders game media is effective in increasing grade 1 students' understanding of mathematical concepts in the material of addition and subtraction word problems.

ACKNOWLEDGMENTS

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