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APPLICATION OF THE CONTEXTUAL TEACHING AND LEARNING MODEL THROUGH TEACHING AT THE RIGHT LEVEL ASSISTED BY CONCRETE MEDIA TO IMPROVE MATHEMATICAL PROBLEM-SOLVING SKILLS

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Abstract

The background of the problem in this study is the low mathematical problem-solving ability and learning outcomes of grade II students of SD Negeri 1 Banjarsari Kulon. In the mathematics learning process, where students are less able to understand the material delivered by the teacher, and in doing problems do not use the solution steps, causing low students' ability to solve problems so that learning outcomes are not optimal. The research conducted during these 3 cycles aims to improve the ability to solve mathematical problems in measurement materials. Data on problem-solving skills and activities of teachers and students using observation sheets and through written tests were both quantitatively analyzed. This success indicator with an average percentage of overall mathematical problem-solving ability reaches 75%. The results of this study show that the average percentage of problem-solving ability in cycle 1 is 43% (less) to 82% (very good) in cycle III. In the aspect of completeness, learning outcomes were shown at an average of 68% completeness in cycle I and to 84% in cycle III.

Keywords: *Contextual Teaching and Learning, Concrete Media, Problem-Solving Skills, Teaching at The Righ Level.*

INTRODUCTION

The new paradigm of the independent curriculum is the latest curriculum prepared by the government to meet the needs of students. According to Rahayu *et al.* (2022) said that the independent curriculum is interpreted as a learning design that makes it easier for students to learn comfortably without pressure in developing their natural talents. There are three characteristics that must be considered when implementing the independent curriculum, namely: 1) the existence of the P5 program (Pancasila Student Profile Strengthening Project) to develop *students' soft skills* and character; 2) the material taught focuses more on material that is fundamental, relevant, and in-depth; 3) teachers and students have the flexibility to determine the learning activities carried out according to the background of each student (Rahayu *et al.*, 2022). Of these three characteristics, there are three points where teachers have flexibility in determining learning tools, managing classes and freedom in how to deliver material that has been adapted to the learning needs and interests of students (Apriliani *et al.*, 2024).

Judging from these characteristics, an approach that can optimize literacy and numeracy skills is by using the *Teaching at the Right Level* approach (Mubarokah, 2022). According to Fitriani (2022), *Teaching at the Right Level* (TaRL) is an approach that is not based on the grade level but on the ability of the students. This TaRL approach aims to improve students' abilities and knowledge in literacy and numeracy. According to Mubarokah (2022), the TaRL approach aims to provide improvements in student learning outcomes. In line with Ahyar *et al.* (2022) explained that the TaRL approach can also

motivate students in learning. The approach is not based on grade level or age but focuses on the level of students' ability in the implementation of learning. The TaRL approach is given for teaching purposes according to the needs and abilities of each student (Ismail *et al.*, 2024). Its application can be done in mathematics learning.

Mathematics is a science that is the background of a series of technologies, so it is essential to be taught to students to face the changing times. According to Pratidiana (2021), the essence of mathematics is the formation of knowledge that comes from ideas, processes, and reasoning. The word mathematics is related to knowledge and knowledge that is abstract. Based on the explanation by Hidayat (2019) that mathematics learning in elementary school aims to understand mathematical concepts, the use of reasoning in learning.

Based on observations made at SDN 1 Banjarsari Kulon in grade II Mathematics Learning, it turned out to show unsatisfactory results. This can be shown from the results obtained after the diagnostic analysis test was carried out from 31 students, only 16 students obtained a score of 70 and above or about 48% were complete and 2 students could not read. The classroom atmosphere is not conducive, students are a little passive because they only listen to the teacher's explanations, students often make a fuss by themselves or talk to their friends when the teacher explains the material, in doing the questions they are immediately focused on the answer without any problem-solving steps, the learning model used is less varied. The results of these observations found problems in the mathematics learning process, where students are less able to understand the material delivered by the teacher, and in doing problems do not use solving steps, causing low students' ability to solve problems so that learning outcomes are not optimal.

To overcome these problems, the solution that can be made is to design learning strategies that can help students develop their thinking skills. One of the learning models that can be applied is *the Contextual Teaching and Learning* (CTL) model. The CTL model allows students to improve critical thinking skills well (Taofek & Agustini, 2020). In addition, according to Syaifuddin *et al.* (2021) explained that the CTL model is able to have a positive impact on improving student learning outcomes. To help students develop their thinking skills, so that as a learning support, concrete media is used. Concrete media is a tool that is used as an intermediary or introduction of information used by teachers to convey to students using tools that are really real, can be seen, touched, held, and used by students (Wijaya *et al.*, 2021). Concrete object media functions as a concrete and tangible tool in the mathematics learning process. By using this medium, Mathematics concepts can be easier for students to understand because they can see and feel objects or tools that are directly related to the subject matter. Concrete object media can also increase student engagement in learning, as they can actively participate in using and manipulating these objects.

Based on this background, a class action research (PTK) will be carried out with the title "Application of *the Contextual Teaching and Learning* (CTL) Model with a *Teaching at the Right Level* (TaRL) Approach assisted by Concrete Media to improve mathematical problem-solving skills."

METHOD

The type of research conducted is Classroom Action Research in general including four steps, namely: 1) planning, 2) action or implementation, 3) observation or observation, and 4) reflection. These four steps are carried out sequentially and identified into a cycle. The cycle is carried out repeatedly with the same steps starting from cycle 1, cycle 2 and so on (Setyosari, 2010). The process of implementing classroom action research can be referred to from several models, but what is used in this study is by using the cycle model proposed by Kemmis & Taggart which consists of: planning, acting, observing, and reflecting, the results of this reflection are then used to improve planning (revise plan) (Kurnianto, 2009). In simple terms, the flow of implementing class actions is presented in figure 1:

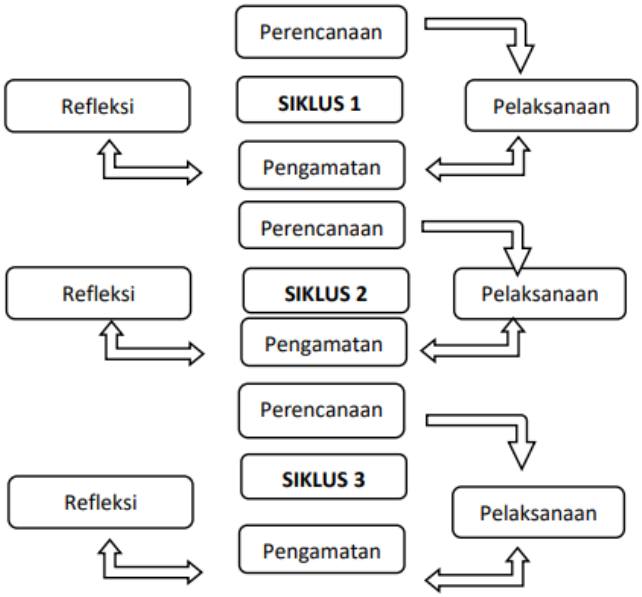

Figure 1. Stages of the Classroom Action Research Cycle

This research is planned in 3 cycles, namely cycle I, cycle II, and cycle III. The learning applied is the contextual teaching and learning (CTL) learning model through the teaching at the right level (TaRL) approach assisted by concrete object media in mathematics learning measurement. The subjects in this study are all grade II students at SD Negeri 01 Banjarsari Kulon kec. Sumbang Regency, Banyumas for the 2023/2024 school year which consists of 31 students, namely 17 male students and 14 female students.

The data collection techniques used are observation, tests and documentation. Observation sheets are used to collect data on teacher activities and student activities in the learning process by applying the contextual learning model (CTL) with the TaRL approach assisted by concrete object media. Observation sheets, consisting of observation sheets of teacher learning activities and

observation sheets of student learning activities. Observations are made by observers. The form of the statement uses yes and no answers and fills in with a checklist system. Documents are used to obtain data to strengthen research, provide evidence during the research and learning process that takes place in the classroom. Documents can be in the form of student grade lists, lesson plans, evaluation question grids, photos of activities, or videos of the learning process in the classroom. The test is used to find out and measure students' mathematical problem-solving skills. The form of the question provided is a question with a brief description. The description questions are arranged based on the basic competencies and indicators in the theme. The test result data will be used as a reference for reflecting and designing the implementation of further learning actions.

The indicator of success in this study is the improvement of students' problem-solving skills in mathematics learning from cycle to cycle. Students' ability to solve mathematical problems is said to increase if the learning outcomes of students reach KKM with a score of ≥75 reaching 75% and the average percentage of overall mathematical problem-solving ability reaches 75%.

RESULTS AND DISCUSSION

The indicators of mathematical problem ability in this study are as revealed in the steps to solve problems according to Polya, including understanding the context of the problem, identifying the elements that are known and asked and formulating the problem in the form of a mathematical model of the problem, choosing the right solution strategy, solving the mathematical model, interpreting the results of the original problem, and re-examining the correctness of the solution (Hendriana *et al.*, 2017).

In table 1, it can be seen that the average presentation results of the improvement of mathematical problem-solving ability indicators from cycle I to cycle III can be seen.

Table 1. Mathematics Problem Solving Ability Test Cycle I-III

No	Indicators	Cycle			Average	Increased
		I	II	III		
1	Analyze the problem	57%	74%	83%	69%	66%
2	Planning solutions/strategies	32%	69%	83%	59%	46%
3	Executing the plan	48%	72%	81%	64%	57%
4	Making conclusions	36%	71%	82%	70%	47%

For more details, the improvement of students' problem-solving skills in mathematics in grade II of SD Negeri 01 Banjarsari Kulon can be seen in the following figure 2:

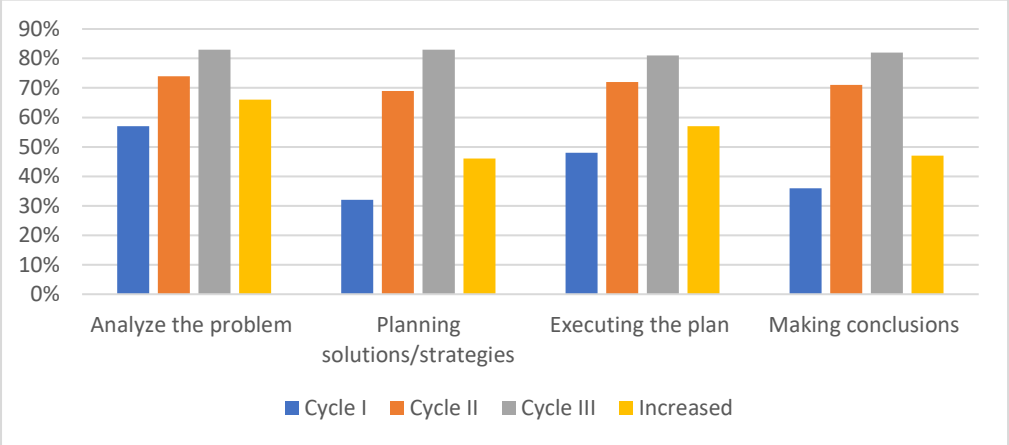

Figure 2. Improving Mathematical Problem-Solving Skills

In the first cycle, there was an increase in the number of students who mastered each problem-solving indicator. In the first cycle, 57% of students were able to understand the problem, but in planning, solving, and rechecking the results obtained were still less than 50%. In the second cycle, it was known that 74% of students were able to understand problems, plan and solve problems according to plan. In cycle III, the mastery of each indicator reached 83%.

The low mastery of indicators in cycle I was caused by two students who were not fluent in reading and there were still students who could not understand the form of the questions and how to solve them. To overcome this, teachers take additional actions to refresh their initial knowledge through a peer tutor system to recall the measurement material. After these actions were taken, there was an increase in problem-solving ability in cycle II, especially for indicators of planning and solving problems by 54% from cycle I. Likewise, in cycle II and cycle III there was an increase of 14%.

This certainly also has an impact on the acquisition of student learning outcomes. Through the results of this study, it is also shown that the CTL learning model through the TaRL approach assisted by concrete object media has a positive impact on improving learning outcomes. This can be seen from the increasing number of students who reach and above KKM. Thus, it can be said that the completeness of student learning has been classically achieved. In line with Purwati *et al.* (2019) explained that the CTL model is able to help improve students' problem-solving skills.

Table 2. Average Student Learning Outcomes

No	Components of Analysis	Cycle I	Cycle 2	Cycle 3	Information
1	Complete your studies	72%	88%	85%	Increase
2	Not yet complete learning	22%	16%	0	Decreased

According to table 2, based on the test results in cycle I, the highest score of 92 and the lowest score of 40 were obtained, in cycle II, the highest score of 100 and the lowest score of 50 were obtained. In cycle III, the highest score of 96 and the lowest score of 76 were obtained. Thus, it can be said that the contextual teaching and learning (CTL) learning model through the Teaching at the right level

(TaRL) approach can improve students' problem-solving skills which is shown by increasing the percentage of classical learning completion. In addition, according to Mustafa *et al.* (2024) the TaRL approach is a real alternative in improving the quality of students' ability to solve problems.

Improvement of Teacher and Student Activities

Based on the observation results, the average percentage of teacher activities when the learning process increases. The collected data is detailed in the appendix. The average percentage of teacher activities during the learning process has increased from cycle I to cycle III. The increase in observers in teachers of cycle I, cycle II and cycle III can be seen in table 3 below:

Table 3. Results of Observation of Teacher Activities

Cycle	Value
I	68%
II	77%
III	84%
Average	76%
Increased	75%

The increase in learning activities carried out by teachers from cycles I, II, and III can be seen in figure 3.

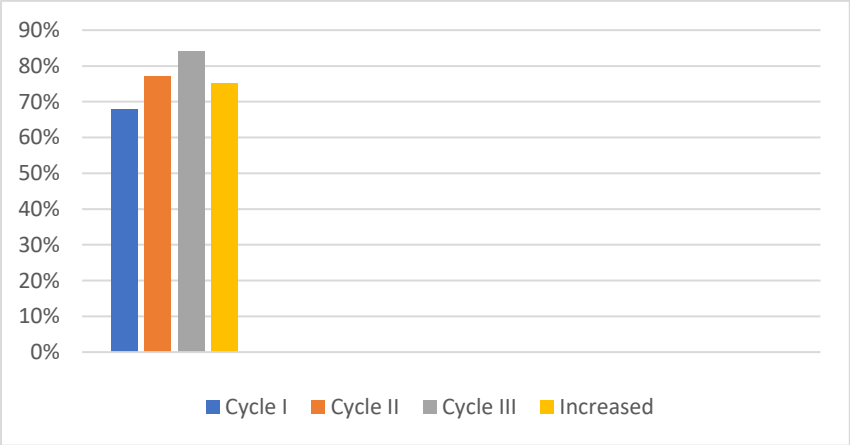

Figure 3. Results of Observation of Teacher Activities

From table 3 and Figure 2 above, it is known that teacher activities during the learning process took place in cycle I by 68%, cycle II by 77% and cycle III by 84%. Thus, teacher activities during the learning process from cycle to cycle have increased by 75%. These results show the achievement of learning quality. The CTL model has a positive impact on the quality of learning and the process of learning activities in the classroom (Khotimah *et al.*, 2016). Based on the discussion above, it can be said that the learning model plays a very important role in improving students' mathematical problem-

solving skills, in addition to the learning model, things that affect the improvement of students' mathematical problem-solving abilities in each cycle are good teacher activities, good student activities, and learning independence. Therefore, one of the solutions that can be done is to increase learning independence through the CTL and TaRL models (Santoso, 2024). In addition, if students' mathematical problem-solving skills increase, then learning achievement will also increase (Purwanto et al., 2022). This shows that the ability to solve problems and learning achievement is directly proportional or in line.

CONCLUSION

Based on the results of the class action research and discussions that have been presented, it can be concluded that learning using *the contextual teaching anda learning* (CTL) learning model with the *Teaching At The Right Level* (TaRL) approach with the help of concrete object media can improve participants' problem-solving skills, this is characterized by 1) The average percentage of each indicator in cycle I, students' ability to analyze problems reached 57%, planning strategies reached 32%, implementing plans reached 48% and explaining or checking the correctness of the answers obtained reached 36%. In cycle II, students' ability to analyze problems reached 74%, planning solutions reached 69%, implementing plans reached 72% and explaining or checking the correctness of the answers obtained reached 72%. In cycle III, students' ability to analyze problems reached 83%, planning solutions reached 83%, implementing plans reached 81% and explaining or checking the correctness of the answers obtained reached 82%, so that the average percentage of overall problem-solving skills reached 65.5%. In this case, it is included in the good category. 2) The average student learning outcome in cycle I is 72%, cycle II is 88%, cycle III is 85% or has increased by 75% and meets the set target, namely 75% of students who are declared complete.

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