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Enhancing Students' Problem-Solving Skills through the PBL Model assisted with the Media of Local Wisdom Mathematical Snakes and Ladders

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Abstract

Problem-solving skills are the most basic thing that students must have as they can train students to deal with various existing problems in learning. The background to this research is the students' low problem-solving skills in the learning process in the classroom. This research, thus, aims to improve problem-solving skills in mathematics subjects through the Problem-Based Learning model with the help of Local Wisdom Mathematical Snakes and Ladders media. This classroom action research was conducted at Birrul Walidain Muhammadiyah Elementary School, with 28 students as research subjects. This research was carried out in two cycles, each cycle consisting of four stages: planning, implementation, observation, and reflection. The data were obtained through tests, observation, interviews, and documentation. The data were then analyzed quantitatively and qualitatively. The research results demonstrated that problem-solving skills could increase with each cycle. This could be observed from the research results, proving that students' problem-solving skills achieved success of 32.14% in the pre-cycle, reached 71.42% in cycle I, and increased to 85.71% in cycle II. Based on their effectiveness, the Problem-Based Learning model and the Local Wisdom Mathematical Snakes and Ladders learning media implemented can be employed as a recommendation for class teachers in carrying out learning since they can help students be more active and improve their ability to think critically and solve real problems.

Keywords: PBL, Problem-Solving Skills, Local Wisdom, Snakes and Ladders Media

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Abstrak

Kemampuan pemecahan masalah hal yang paling dasar yang harus dimiliki siswa sebab dapat melatih siswa dalam menghadapi berbagai permasalahan yang ada dalam pembelajaran. Latar belakang penelitian ini adalah rendahnya kemampuan pemecahan masalah pada siswa dalam proses pembelajaran di dalam kelas. Tujuan penelitian ini yaitu untuk meningkatkan kemampuan pemecahan masalah pada mata pelajaran matematika melalui model pembelajaran Problem Based Learning dengan bantuan media Ular Tangga Matematika Kearifan Lokal. Penelitian tindakan kelas ini dilakukan di SD Birrul Walidain Muhammadiyah dengan subjek penelitian sebanyak 28 siswa. Penelitian ini dilaksanakan dalam dua siklus, setiap siklus terdiri dari empat tahap yaitu perencanaan, pelaksanaan, observasi dan refleksi. Pengumpulan data diperoleh melalui tes, observasi, wawancara dan dokumentasi. Data dianalisis secara kuantitatif dan kualitatif. Hasil penelitian menunjukkan bahwa kemampuan pemecahan masalah dapat meningkat setiap siklusnya. Hal ini terlihat dari hasil penelitian membuktikan bahwa kemampuan pemecahan masalah siswa pada prasiklus mencapai keberhasilan sebesar 32,14%, sedangkan siklus I mencapai 71,42% dan pada siklus II meningkat menjadi 85,71%. Berdasarkan keefektifan model pembelajaran Problem Based Learning serta media pembelajaran Ular Tangga Matematika Kearifan Lokal yang telah diterapkan tersebut dapat dijadikan rekomendasi bagi guru kelas dalam melaksanakan pembelajaran sebab dapat membantu peserta didik lebih aktif dan dapat meningkatkan kemampuan berfikir kritis siswa serta mampu memecahkan suatu masalah dengan nyata.

Kata Kunci: PBL, Problem-Solving Keterampilan, Kearifan Lokal, Media Ular Tangga

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INTRODUCTION

Education is a vital thing that humans must have. However, it needs to be emphasized that education is not merely a process of transferring knowledge from educators to students but aims to increase the potential of human resources in producing an intelligent next generation for the nation. This aligns with the opinion of Melati et al. (2021) that education is expected to produce a generation with intellectual intelligence, life skills, and good character. In producing quality education, one way is to implement the right curriculum. In mathematics subjects, the curriculum applied in the third grade of Birrul Walidain Muhammadiyah Elementary School was still the 2013 curriculum. The 2013 curriculum places more emphasis on students having active learning independently to build their knowledge (Anam et al., 2023). Therefore, the 2013 curriculum certainly has differences from the previous curriculum in that it underscores SCL (Student-Centered Learning) more in the sense that students are the learning subjects, while educators only act as facilitators and motivators for students.

Based on the results of observations carried out on July 31, 2023, the researchers uncovered problems in the learning process, i.e., the lack of enthusiasm and interest of students in participating in learning because mathematics lessons are a scary learning threat and difficult to understand. In fact, learning mathematics is one of the main subjects taught at the elementary school level, which is useful for everyday life (Riswari et al., 2024). Apart from that, learning mathematics can be said to be a science related to thought patterns or abstract concepts, where these concepts can cause students to experience difficulties when learning mathematics (Laurens et al., 2018). Moreover, students in elementary schools are required to be skilled in solving mathematical problems so that, when students enter the next level, they can master and solve the problems they face. Therefore, one of the skills that elementary school students must have in education is problem-solving skills.

Problem-solving skills are an important part of mathematics learning as they can build students' self-confidence in solving mathematical problems (La'ia & Harefa, 2021). Consistent with that, problem-solving skills need to be trained and developed so that students can solve the problems that will be faced in the future (Sagita et al., 2023). Hence, the role of teachers is highly needed in mathematics learning because if students have a good understanding of problem-solving, it will also influence other subjects (Setyaningrum et al., 2023). However, in reality, students frequently encounter difficulties in problem-solving skills when learning mathematics. According to Riswari & Ermawati (2020), another weakness found was students' weakness in analyzing questions, monitoring the solution process, and evaluating the results. In other words, students prioritized solving techniques only, using easy methods.

These results were strengthened by interviews conducted with teachers on August 2, 2023. It was revealed that mathematics subjects had relatively low scores compared to other subjects because when teachers applied story problems to learning, students were more likely only to memorize how to solve the problems without understanding the meaning of the questions given. Hence, a difference existed; when the teacher gave simple questions, it was easy for them to solve them. In contrast, when the teacher changed the questions into story form, students experienced difficulty in applying the arithmetic operations to solve the story problems. Conditions like this caused students' problem-solving skills to be relatively low.

Aside from that, the low problem-solving skills of students could also be seen from the results of the pre-cycle, which was held on Tuesday, August 1, 2023, exhibiting that 28 people only got an average problem-solving skill score of 55.14%. In other words, only nine students were categorized as complete, while 19 other students were classified as incomplete. This could happen because students were not careful in reading and understanding sentence by sentence in story questions, and students were still used to learning, which always involved the teacher during the learning process. Therefore, teachers must implement a learning model that can make students more active to improve students' critical thinking skills and be able to solve real problems.

Generally, a learning model is a conceptual framework that teachers use in teaching and must be able to control and master the conditions in the classroom (Risasongko et al., 2023). The learning model can also be interpreted as an appropriate alternative for creating interesting and enjoyable learning (Radya et al., 2023). Therefore, before choosing a learning model that will be used during the learning process, the teacher must adapt the model to the objectives of the learning material. However, the reality reveals that during the learning process, students are not yet accustomed to adapting learning because educators have never utilized varied learning models. As a result, the response that students have during learning is still relatively low. Based on the problems that occur, researchers provide solutions by applying the Problem-Based Learning model.

According to Asdamayanti et al. (2023), the Problem-Based Learning model is a model that teaches students to maximize their thinking abilities when solving problems. Meanwhile, the syntax of the Problem-Based Learning model used in this research includes 1) orienting students to problems, 2) organizing students to learn, 3) guiding group and individual investigations, 4) developing and presenting work results, and 5) analyzing and evaluating the problem-solving process.

Applying the Problem-Based Learning model to learning can be useful as a form of effort to improve and enhance the quality of learning, which refers to students playing while learning in the third grade at Birrul Walidain Muhammadiyah Elementary School. This is equivalent to research by Agus et al. (2022), Akhmad et al. (2023), Najoan et al. (2023), Nisa (2023), and Indana et al. (2024). Their research results have proven that using the PBL model can improve quality during the learning process. Meanwhile, the difference between the current research and the research conducted above lies in the research subjects, media used, subjects, and research locations.

Apart from using the PBL learning model, the discovery of mathematical concepts needs to be balanced with the use of learning media. Learning media is beneficial for activating students and avoiding a boring or monotonous learning process. This agrees with the opinion of Kurniawati et al. (2023) that learning that can be activated is learning while playing using learning media because students are not motivated to take part in learning if the learning implemented by the teacher is only monotonous. In addition, according to (Syafii et al., 2022), by playing, students will more easily learn many things in learning. Local Wisdom Mathematical Snakes and Ladders Media is one of the media that can be applied.

Local Wisdom Mathematical Snakes and Ladders are game-based media devices that students use in the learning process, thus helping students improve their problem-solving skills in mathematics lessons by using fractions. This snakes and ladders learning media is a traditional game modified into a modern game. One of them is that the snakes and ladders media board in this lesson was made from a banner measuring 2x2 m, consisting of 30 columns of numbers. In this learning media, various kinds of images also show local wisdom around the Kudus area, Indonesia. There are question cards, zone cards, and challenges that students must take on. This media has several advantages in its use, including students being able to play while learning, being able to foster interest in learning, and being able to shape students' character in recognizing local wisdom in Kudus.

Similar studies have used modified snake and ladder media (Rahayu et al., 2022; Andriani & Wahyudi, 2023; Destyaningrum & Arini, 2023; Nurhidayah, 2023; Purnama & Kalkautsar, 2023; Setyowati et al., 2023). The results of their research disclosed that the media modification of the Snakes and Ladders game can help teaching and learning activities and improve students' problem-solving skills.

The application of the Problem-Based Learning model and Local Wisdom Mathematical Snakes and Ladders media has proven to be effective in improving the problem-solving skills experienced by students. Some related to previous research such as Susanto et al. (2019), Ramadhani (2021), Hidayati (2022), Daeli (2023), and Panggabean & Sinambela (2023) stated that there was an increase in the average successful problem-solving skills using the Problem-Based Learning model. From the results of this research, there are several similarities in the

application of the Problem-Based Learning model, where learning involves students in achieving learning goals and problem-solving skills.

From the existing problems, the researchers are interested in researching to improve problem-solving skills. The researchers conducted research using the Problem-Based Learning model and Local Wisdom Mathematical Snakes and Ladders media so the researchers took the aim of enhancing students' problem-solving skills through the PBL model assisted with the Media of Local Wisdom Mathematical Snakes and Ladders. Apart from that, it is anticipated that this classroom action research can contribute to the development of learning quality and serve as a consideration for educators in using innovative models and media to improve problem-solving skills.

METHODS

The research method employed in this research was classroom action research (CAR). This research was conducted at Birrul Walidain Muhammadiyah Elementary School, with 28 third-grade students as research subjects. The design model in this research was guided by the opinion of Kemmis and Taggart, where each cycle consists of two meetings, with each meeting going through four stages: planning, implementing activities, observing, and reflecting. Apart from that, the data collection techniques used by the researchers were test and non-test techniques. Test techniques were used to measure students' problem-solving skills in learning mathematics.

Meanwhile, the problem-solving skill indicators used follow Alfiandari et al. (2022), including understanding the problem, planning the problem-solving, implementing the solution, and checking again. On the other hand, non-test techniques were utilized to collect qualitative data related to the results of problem-solving skills in Chapter III, Fractions. Non-test techniques comprised interviews, observation, and documentation. In this classroom action research, the data analyses used were quantitative and qualitative. While quantitative data was used to calculate the percentage of success in problem-solving skills, qualitative data was employed to analyze problem-solving skill data descriptively. The formula for calculating the percentage of individual achievement is as follows.

$$N = \frac{Earned\ Score}{Maximum\ Score} \times 100$$

For the formula to determine the classical average percentage for each indicator of problem-solving skill, the following method was used converting table.

Table 1. Criteria for Assessment of Problem-Solving Skill Indicators

Value Score	Criteria
85 – 100	Very high
70 – 84.99	High
55 – 69.99	Moderate
40 – 54.99	Low
0 – 39.99	Very low

Source: (Oktasya et al., 2022)

Calculating the percentage of completeness of classical problem-solving skills was done by:

$$P = \frac{\sum Completed\ students}{\sum Students} \times 100\%$$

Table 2. Percentage of Completion of Problem-Solving Skills

Value Score	Predicate of Success
85 – 100	Very high
70 – 84.99	High
55 – 69.99	Moderate
40 – 54.99	Low
0 – 39.99	Very low

Source: (Oktasya et al., 2022)

The Minimum Completion Criteria (KKM) determined by the school was 74. As a benchmark for success, it was determined from the problem-solving skill indicator, which is said to be successful if classical completeness is ≥ 74% or can be said to be more or less high criteria.

RESULTS AND DISCUSSION

The research was carried out at Birrul Walidain Muhammadiyah Elementary School on third-grade students, who totaled 28 students. This research was performed by applying the Problem-Based Learning model with the help of Local Wisdom Mathematical Snakes and Ladders media. This research was conducted through two cycles. In each cycle, there were four stages, which included planning, implementing activities, observing, and reflecting.

Cycle I Result

1. Planning

At this stage, the researchers prepared a learning tool instrument that was used as an initial step as research material to be carried out, including 1) analyzing KI (Core Competencies) and KD (Basic Competencies) in chapter 3 of elementary school mathematics, 2) compiling a syllabus, 3) compiling a lesson plan, 4) compiling an LKPD (Students' Worksheet), 5) compiling a grid of evaluation questions for cycle I, 6) compiling evaluation questions for cycle I, 7) compiling an observation sheet, and 8) preparing media.

2. Implementing activities

Implementation of activities during learning was carried out in two meetings based on the PBL model. In the first stage, the teacher began the lesson with a joint prayer, checking attendance, conveying an apperception, and conveying the learning objectives. Next, the teacher asked the students several questions through pictures, but the students were still shy and hesitant to answer the questions asked by the teacher.

Figure 3. Starting Learning Using the PBL Model and Local Wisdom Mathematical Snakes and Ladders Media in Cycle I

As Figure 1 illustrates, students started learning by playing while learning by applying the PBL learning model. However, when they were divided into groups, some students did not want to play with their group members. As a result, the class became not conducive. Furthermore, at the teacher guiding stage, an obstacle was found in the group, namely that students did not want to ask the teacher when they experienced difficulty in working on questions that had been obtained based on the results of playing Local Wisdom Mathematical Snakes and Ladders. Then, at the next stage, the teacher invited students to present the results of their discussion in front of the class, but what happened was that only some groups dared to come forward. The final stage was when the teacher reviewed the learning that students had done, who had not focused on paying attention to the teacher. At the second meeting, the teacher carried out the steps according to the first meeting but with different material. At each final or second meeting, the teacher distributed evaluation questions consisting of five essay questions for students to work on.

3. Observing

The results of students' problem-solving skills in mathematics were obtained from the results of the evaluation test in cycle I, which was carried out at the end of meeting 2. The following are the results of problem-solving skills in cycle I.

Table 3. Results of Problem-Solving Skill Values

No	Level of success	Predicate	Freq	%
1	85 – 100	Very high	6	21.42%
2	70 – 84.99	High	14	50.00%
3	55 – 69.99	Moderate	6	21.42%
4	40 – 54.99	Low	2	7.14%
5	0 – 39.99	Very low	0	0.00%
The Total of students			28	100%
The Total of scores			2154	
Average of scores			76.92	
Number of students completed			20	
Number of students who did not complete			8	
Classical completeness			71.42%	

From Table 3 above, it is known that only 6 students got a score between 85 and 100, with a percentage of 21.42 in the very high predicate. Likewise, 14 students obtained a score of 70 to 84.99, with a percentage of 50% in a high predicate. Meanwhile, for students who got a score of 55 to 69.99, there were only 6 students, with a percentage of 21.42% in the moderate predicate. Furthermore, only 2 students obtained a score of 40 to 54.99, with a percentage of 7.14% in the low predicate, and no students got a score of 0 to 39.99 in the very low predicate category. Based on the cycle I data, it can be concluded that the average student score in mathematics was 76.92, so it has been proven that only 20 students completed it, and 8 of them did not complete it with a classical completion percentage of 71.4%. With this percentage attained, the success indicator did not reach the target desired by the researchers, so the researchers continued in cycle II. Apart from that, there was an analysis of the average score for each indicator of problem-solving skills, which can be seen in the following table.

Table 4. Analysis of Each Indicator of Problem-Solving Skills

No	Problem-Solving Skills Indicator	Average	Predicate
1	Understanding the problem	84.5	Good
2	Planning problem solving	84.6	Good
3	Implementing the solution	69.5	Good enough
4	Checking again	68.9	Good enough

According to the results of the analysis of each indicator of students' problem-solving skills in cycle I, the indicator of understanding problems received an average score of 84.5, with a good predicate. Meanwhile, the second indicator, namely planning problem-solving, achieved an average value of 84.6, with a good predicate. Apart from that, the third indicator was implementing the solution, obtaining an average score of 69.5 with a good enough predicate. Furthermore, the fourth indicator, i.e., checking again, got an average value of 68.9, with a good enough predicate.

4. Reflecting

From the results of reflection in cycle I, it was found that students needed to adapt to the use of learning models and media that they had never used. This could be observed from several obstacles experienced, including that students still appeared shy and hesitant in answering the teacher's questions; the class atmosphere became crowded, and students did not like the members of their group that had been determined; groups who still had difficulty doing their work did not want to ask the teacher; only a few groups dared to come forward and express the results of their discussions in front of the class; and students had not focused on paying attention to the teacher. Aside from that, the results of students' problem-solving skills in mathematics subjects obtained a classical completeness of 71.42%, where these results also did not meet the indicators of success. Accordingly, further research was required in the hope of improving problem-solving skills.

Cycle II Result

1. Planning

The researchers started planning again based on the results of reflection in cycle I. That is where the researchers planned the arrangement, including 1) analyzing KI (Core Competencies) and KD (Basic Competencies) in chapter 3 of elementary school mathematics, 2) compiling a syllabus, 3) compiling a lesson plan, 4) compiling an LKPD (Students' Worksheet), 5) compiling a grid of evaluation questions for cycle I, 6) compiling evaluation questions for cycle I, 7) compiling an observation sheet, and 8) preparing media.

2. Implementing activities

The implementation of cycle II was carried out based on the reflection results of cycle I, with the same learning steps. When students were oriented toward problems, they improved a lot because many students were enthusiastic about expressing their opinions. It can be seen from Figure 2 that in the stage of organizing students to learn, students were very enthusiastic and were used to playing using Local Wisdom Mathematical Snakes and Ladders media by applying the PBL model compared to cycle I.

Figure 2. Starting Learning Using the PBL Model and Local Wisdom Mathematical Snakes and Ladders Media in Cycle II

Apart from that, when guiding individual and group investigations, students were not reluctant to ask the teacher to be guided. The next stage, developing and presenting the results of their work, demonstrated that all groups had implemented good presentation procedures and dared to come forward when presenting the results of their discussion. In the final stage, analyzing and evaluating the results of problem-solving, students were focused on paying attention to the teacher. Furthermore, at the second meeting, the teachers carried out the steps according to the first meeting but with different material. At each final or second meeting, the teacher also distributed evaluation questions consisting of five essay questions for students to work on.

Meanwhile, the differences between cycle I and cycle II in implementing activities were as follows. In cycle I, the teacher still looked nervous when delivering material to students, whereas in cycle II, there was an increase in the teacher's relaxedness when teaching. Then, in cycle I, it was found that when dividing into groups, the teacher was still lacking in mastering the class; as a result, students became rowdy. In comparison, in cycle II, there was an increase, namely that the teacher had mastered the class by making a mutual agreement on what rules were allowed and not allowed during activities so that students obeyed the applicable rules.

In addition, in cycle I, it was revealed that when carrying out student orientation activities toward problems, some students still looked shy and hesitant in answering the teacher's questions. In contrast, in cycle II, there was an increase in students being more enthusiastic and confident in answering the teacher's questions. Furthermore, in cycle I, it was observed that during the activity of developing and presenting the results of their work, only a few groups dared to come forward to express the results of their discussion because the students still lacked confidence. Meanwhile, there was an increase in cycle II, revealing that all groups dared to appear in front of the class with confidence to express the results of their discussions. Also, in cycle I, it was uncovered that students had started learning using media enthusiastically. However, this enthusiasm made the class atmosphere busy because they were not used to using Local Wisdom Mathematical Snakes and Ladders media. In contrast, in cycle II, there was an increase, where students were no longer busy and already understood how to play Local Wisdom Mathematical Snakes and Ladders media. From the results of the implementation of the actions that occurred in cycle II, most of the students had experienced improvements or corrections so that they did not need to be continued in the next cycle.

3. Observing

The results of students' problem-solving skills in mathematics were obtained from the results of the evaluation test in cycle II, which was carried out at the end of meeting 2. The following are the results of problem-solving skills in cycle II.

Table 5. Results of Problem-Solving Skill Values

No	Level of success	Predicate	Freq	%
1	85 – 100	Very high	16	57.14%
2	70 – 84.99	High	11	39.28%
3	55 – 69.99	Moderate	0	0%
4	40 – 54.99	Low	1	3.57%
5	0 – 39.99	Very low	0	0.00%
The Total of students			28	100%
The Total of scores			2386	
Average of scores			85.21	
Number of students completed			24	
Number of students who did not complete			4	
Classical completeness			85.71%	

Table 5 displays those 16 students got scores between 85 and 100, with a percentage of 57.14 in the very high predicate. Similarly, with students who got a score of 70 to 84.99, only 11 students got it, having a percentage of 39.28% in a high predicate. Meanwhile, there were no students who got a score of 55 to 69.99 in the moderate predicate. Furthermore, there was 1 student who got a score of 40 to 54.99, with a percentage of 3.57% in the low predicate, and there were no students who got a score of 0 to 39.99 in the very low predicate category. Hence, from the data obtained in cycle II, it can be concluded that the average score of students in mathematics was 85.21; 24 students had completed it, and 4 of them had not yet completed it, with a classical completion percentage of 85.71%. In other words, indicators of success in problem-solving skills had been achieved. Moreover, there was an analysis of the average score for each indicator of problem-solving skills, which can be seen in the following table.

Table 6. Analysis of Each Indicator of Problem-Solving Skills

No	Problem-Solving Skills Indicator	Average	Predicate
1	Understanding the problem	94.0	Very good
2	Planning problem solving	93.2	Very good
3	Implementing the solution	70.5	Good
4	Checking again	86.1	Very good

The results of the analysis of each indicator of students' problem-solving skills in cycle II above indicate that the indicator of understanding problems received an average score of 94.0 with a very good predicate. Meanwhile, the second indicator, namely planning problem-solving, had an average value of 93.2 with a very good predicate. Following that, the third indicator, implementing the solution, obtained an average score of 70.5 with a good predicate. Furthermore, the fourth indicator, checking again, reached an average value of 86.1, with a very good predicate.

4. Reflecting

Based on the results of reflection in cycle II, it was found that the indicators of problem-solving skills in mathematics subjects had been achieved and could be stopped in cycle I.

Discussion

This classroom action research was carried out to improve problem-solving skills through the application of the Problem-Based Learning model to third-grade students at Birrul Walidain Muhammadiyah Elementary School, especially in fractions. Based on the research results, the average student still experienced difficulties in understanding the steps to solve problems. This could happen because they were not used to solving problems in story questions. Thus, there was a need for classroom action research using the Problem-Based Learning model with the help of Local Wisdom Mathematical Snakes and Ladders media.

The results of the first cycle of action had increased since the teacher had implemented the Problem-Based Learning model with the help of the media of Local Wisdom Mathematical Snakes and Ladders. Through the Problem-Based Learning model, students were more active in playing while learning, working together with groups, enhancing student motivation in learning, and increasing student skills in solving problems. Nevertheless, overall, cycle I did not achieve the success indicator, namely classical completeness of at least 74%, so corrective action should be taken in cycle II.

In cycle I, it was found that there were still several obstacles: students were still shy in expressing their opinions; students were still busy when learning took place, so the learning atmosphere was sometimes not conducive; when working on evaluation questions, there were students exchanging answers with their friends; and, students still asked the teacher for help in providing answers. Therefore, the actions that teachers needed to improve so that this would not happen in cycle II were to make a mutual agreement on what rules were permitted and not permitted during learning activities. Teachers needed to provide direction and advice to students so that they were not shy in expressing their opinions and

that students would be confident in working on the questions individually.

On the basis of the results obtained from the classical completion of problem-solving skills in Muhammadiyah Birrul Walidain Elementary School students starting from pre-cycle, cycle I, and cycle II, there had been a significant increase, and an increase could be seen in each cycle. Pre-cycle obtained a percentage of 32.14% with very low criteria; in cycle I, students experienced an increase of 71.42% with high criteria, and it rose again in cycle II, amounting to 85.71% with very high criteria.

Additionally, the results of the analysis of each indicator of problem-solving skills starting from pre-cycle, cycle I, and cycle II showed that the indicators of understanding problems, planning problem-solving, implementing problem-solving, and checking again constantly increased in each cycle. The indicator with the highest value was understanding the problem of 94, with very high criteria that occurred in cycle II. This occurred because students could write correctly what they knew and what was asked in the question, but the answer was still incomplete. Moreover, the results of each indicator were different because the level of difficulty of the questions created in the pre-cycle, cycle I, and cycle II indicators was not necessarily the same. However, if accumulated, it can be concluded that the results of students' problem-solving skill scores had increased significantly, so it can be said that learning was successful using this combination of model and media.

Increasing problem-solving skills could occur due to the use of a combination of the model and media in the learning process. Using the Problem-Based Learning model with the help of Local Wisdom Mathematical Snakes and Ladders media in the learning process could make it easier for students to understand fraction material. The Problem-Based Learning model is a cooperative learning model that is easy to apply in learning, and applying this model has been proven to be very suitable for the characteristics of students at Birrul Walidain Muhammadiyah Elementary School, who tended to be more interested in games in learning. In addition, implementing playing while learning can help students, especially third graders, generate enthusiasm for learning and think critically about solving problems on fractions. This aligns with the opinion of Rosidah (2018) that the advantages of the Problem-Based Learning model include being able to develop students' critical thinking skills, making students actors in learning, making students active in learning, and making students think critically in solving problems and building students' self-confidence in learning. The results of the research that has been carried out are also consistent with previous research (Susanto et al., 2019; Suhartini, 2020; Riswari & Ermawati, 2020; Hidayati, 2022; Daeli, 2023), showing that the similarity with this research is that applying the Problem-Based Learning model in learning can encourage students to solve problems with various kinds of problems and increase students' activeness in learning. Meanwhile, the differences between the research conducted and the relevant research above lie in the research subjects, media used, subjects, and research locations (Andriani & Wahyudi, 2023; Destyaningrum & Arini, 2023; Nurhidayah, 2023; Setyowati et al., 2023).

In improving problem-solving skills, not only is the Problem-Based Learning model applied in learning, but support is also needed from Local Wisdom Mathematical Snakes and Ladders media used by teachers during learning. The results of the research that has been conducted out support a study by Atmoko et al. (2017), stating that when playing snakes and ladders in general, students who serve as pawns will roll the dice to determine how many steps must be taken on the pawn; then, this snakes and ladders game can hone patience, honesty, and cooperation between group members in solving questions given by the teacher.

Furthermore, this Local Wisdom Mathematical Snakes and Ladders media can be used as a learning innovation, especially in mathematics subjects, as it can arouse students' interest in learning and develop critical thinking skills in solving problems. In line with that, Snakes and Ladders media can provide a direct experience of learning while playing so that during the learning process, students do not feel bored because they are

learning while playing and doing (Mar'atusholihah et al., 2019).

Based on the description above, it can be concluded that the problem-solving skills by applying the PBL model assisted by Local Wisdom Mathematical Snakes and Ladders media had increased in pre-cycle, cycle I, and cycle II and succeeded in achieving success indicators. Thus, the hypothesis of success indicator action, "there is an increase by applying the combination of model and media to the problem-solving skills of third-grade students at Birrul Walidain Muhammadiyah Elementary School," was achieved and could be accepted.

CONCLUSION

Based on the results of the research and discussion, it was concluded that there was an increase in problem-solving skills through the PBL model assisted by Local Wisdom Mathematical Snakes and Ladders media. The researchers have implemented the PBL model based on the learning steps used to train students to work together during discussions and become a learning medium that is innovative, creative, and easy for students to use while studying. This was proven by the researchers with an increase in problem-solving skills in the pre-cycle, getting 32.14% with very low criteria, in cycle I, achieving 71.42% with high criteria, and in cycle II, obtaining 85.71% with criteria very high.

From this classroom action research, the researchers recommend three things. The first is the use of the Problem-Based Learning (PBL) model. This is because the syntax of the PBL model is very easy to apply, especially in mathematics subjects, which can develop students in solving problems and thinking critically. Second is the use of Local Wisdom Mathematical Snakes and Ladders media since the teacher only needs to change the question cards according to the learning material. Third, the study of snake and ladder modification media is rarely used due to advances in technology that continue to develop. As such, it is expected that future research will use a lot of modified media for the Snakes and Ladders game that is well designed so that it can attract students' attention and enthusiasm for learning.

This classroom action research provides practical implications from the results, namely that teachers and prospective teachers can use it to improve the quality of learning by using appropriate models and media so that learning objectives can be achieved.

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