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Efforts to Improve Students' Problem Solving Ability Through the Application of Problem Based Learning Assisted by Google Sites

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Abstract

The study carried out by the researcher aims to increase the ability of students to solve problems so that they can increase through the application of the PBL learning model assisted by Google Sites. The study carried out includes classroom action research carried out through two cycles. The researcher will study subjects that include students of class VIII-D in one of the public schools in Yogyakarta City. The implementation of this study by researchers in the odd semester of 2024/2025. In it, the PBL learning model assisted by Google Sites is applied. The data collection techniques used were in the form of tests and observations. The data analysis technique used is descriptive statistics. Researchers also utilize instruments in the form of mathematical problem solving ability test questions and learning implementation observation sheets. In connection with this study, the success indicator can be measured using the improvement of students' mathematical problem solving ability. The acquisition of the class average score on the diagnostic test scored 50.14, the problem solving ability raised an increase in class average from cycle I to cycle II scored 13.57 which in the cycle I problem solving ability test raised a score of 70.79 while in the problem solving ability test for cycle II the average value raised was 84.36. The average observation of teacher learning management in cycle I scored 2.81 (good criteria) then in cycle II it increased to 3.35 (very good criteria).

Keywords: *Problem Solving Ability; Problem Based Learning; Google Sites*

Introduction

Mathematics for life is crucial because it can be used for daily life (Isnaeni et al., 2018). SPLDV is a piece of material that helps learners understand and solve real-world problems (Islamiyah et al., 2018), which shows that learners' understanding of SPLDV has a direct impact on their ability to solve application-based problems. In mathematics teaching, modeling real-world situations can help learners become better problem solvers. However, the fact is that many learners face difficulties in solving SPLDV problems (Santoso et al., 2024).

The problem that many students have in mathematics is when the problem is presented in story form (Sari & Hanipa, 2017). Hadi et al. (2018) added that students' difficulties are generally related to the captured understanding of the keywords in the problem, so they tend to just guess. In addition, referring to Lestari's (2020) exposure, students often have difficulty when asked to explain operations in equations,

write mathematical expressions that use symbols, and analyze problems. As a result, students' ability to solve problems is usually low.

Among the studies on problem solving skills have been reported, in line with the exposure revealed by Salenussa et al. (2022), which shows the analysis of students' initial test data has not met the completeness of each indicator of ability to solve problems. The details of completeness for each indicator are: the ability to plan problem solving 59.44%, the ability to understand the problem reaches 69.16%, the ability to re-examine the results of the solution 41.16% and the ability to implement problem solving 47.22%. The resulting interview with a mathematics teacher at one of the public schools in Yogyakarta also revealed that students often make mistakes when trying to solve problems. In addition, teachers have never conducted research or analysis related to problem solving skills, have not utilized new technology to become learning media, and the focus of the learning process in the classroom is still on the teacher. In fact, for learning mathematics, problem solving is the basic ability and main goal (Amam, 2017). This is in line with the evidence presented by Salenussa et al. (2022) which emphasizes that problem solving skills are crucial so that with the knowledge possessed, various problems that occur can be resolved.

It was found that learning mathematics with the help of Google Sites is indeed effective in improving students' ability in problem solving. By utilizing this platform, teachers can present materials interactively and contextually, which allows learners to apply and understand various mathematical concepts in real-life situations. Nurmilah et al. (2023) demonstrated that the potential of Google Sites that facilitates the presentation of material as well as various simulations or examples of real problems relevant to learning can help students practice rational and systematic thinking. In addition, Sukmawati (2020) emphasized the Problem Based Learning (PBL) model, when applied in a digital environment such as Google Sites, can encourage learners to focus on the interrelationships between mathematical concepts and improve their problem-solving skills. In this context, Google Sites functions not just as a medium for delivering information, but as a collaborative tool where learners can discuss and carry out interactions with each other.

Furthermore, Krisna & Mery Marlinda (2020) stated that PBL emphasizes the problem-solving process rather than focusing on whether the final answer is correct or not. In connection with this process, learners develop skills and build knowledge for problem solving. The use of Google Sites-based learning media containing teaching materials can be an alternative in applying the PBL model. Google Sites is designed to make it easier for teachers to present material and influence students to be more active and interactive during learning (Adam et al., 2023). Rizka Amalia & Khasanah (2023) describe Google Sites can be utilized as a platform to create learning media in mathematics, making it more effective, efficient, and innovative.

Referring to the existing explanation, the study conducted by the researcher provides a problem which is then formulated, namely “Can the application of Problem Based Learning assisted by Google Sites improve the problem solving ability of class VIII-D students?”. While the purpose of the study carried out is to improve students' mathematical problem solving skills through the application of PBL assisted by Google Sites.

Method

This study is a classroom action research, intended to improve the learning process and overcome problems that arise during learning. This study takes the Kemmis and McTaggart model, which includes several stages that can be seen from Figure 1 below.

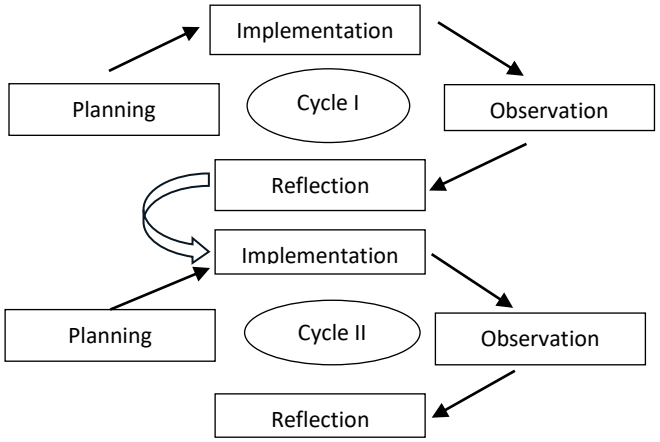

Figure 1. Kemmis & McTaggart Model (2014)

This study was conducted in one of the public schools in Yogyakarta City, with the research subjects consisting of all or a total of 32 students in class VIII-D. The variable studied by the researcher for this study is problem solving ability through PBL learning model supported by Google Sites.

The procedure carried out for this classroom action research is in the form of a cycle. If in the previous cycle the success indicators have not been met, then the next cycle is continued. The study was organized in 2 cycles, each of which included two face-to-face meetings. For the first cycle, the PBL learning model utilizing the help of Google Sites was applied, and the actions in the second cycle were based on the reflection of the first cycle.

The researcher used data analysis techniques in the form of descriptive statistics. Data analysis techniques related to mathematical problem solving skills in this study include:

a. Calculating the percentage of the total score of each indicator of problem solving ability

$$PSI_K = \frac{SI_K}{MSI_K} \times 100\%$$

Description:

PSI_K: Percentage of total score on the k^{th} indicator, k = 1,2,3,4

SI_K: Total score obtained on the k^{th} indicator, k = 1,2,3,4

MSI_K : Maximum score on the k^{th} indicator, k = 1,2,3,4

b. Determination of the percentage of the class that has been able to complete

$$PKK = \frac{\text{Many students are KB} \geq 75\%}{\text{Many research subjects}}$$

Description: PKK = percentage of classical completeness × 100%

The problem solving ability test shows the highest score of 40. The criteria for the level of students' ability to solve problems can be shown, namely:

Table 1. Students' Mathematics Problem Solving Ability Level

(Arifin, 2009)

Mastery Level	Criteria
36 – 40	Very high ability
32 – 35	High ability
28 – 31	Medium ability
24 – 27	Low ability
≤ 23	Very low ability

The category of students' completeness for problem solving is seen through the percentage of the total score of each indicator of problem solving ability and the level of students' problem solving ability. The reason researchers use both is because for problem solving in order to achieve a solution to the problem that occurs cannot be separated from the ability to understand the steps of problem solving.

c. Determining the percentage of classes already able to carry out problem solving

$$DSK = \frac{X}{N} \times 100\%$$

Description:

DSK : Percentage of classes that complete problem solving

X : Many learners complete the problem solving

N : Number of learners in a class

With criteria:

$0\% \leq DSK \leq 85\%$: The class has not completed the problem solving

$85\% < DSK \leq 100\%$: The class completes the problem solving

d. Analysis of Teacher observation results

Learning is called effective when the results of observers' observations on teacher learning management are categorized with at least good criteria. There are criteria for observation results according to Soegito (in Napitupulu, 2011) including:

3.2 – 4.0 : Very good

2.2 – 3.1 : Good

1.2 – 2.1 : Not good

0 – 1.1 : Very Bad

A researcher who carries out actions as a teacher is said to be able to implement learning management through a realistic approach when the average percentage of the researcher's ability as a teacher is at least 2.2 - 3.1 (in the good category).

Researchers used observation and test techniques for the data collection process. The purpose of observation is to collect information and data in connection with certain learning, processes or actions that are being carried out. Tests are used so that the ability to solve mathematical problems can be known

based on student learning achievement data. The instrument includes an assessment of the components of the ability to solve problems.

There are indicators of mathematical problem solving ability on the basis of Polya's stages can be seen referring to table 2.

Table 2. Math Problem Solving Indicators Based on Polya's Stages

Stages of Problem Solving	Indicator
Understanding the Problem	Learners can formulate what is asked, what is known, whether there is enough information, what conditions need to be met.
Developing a Problem Solving Plan	Learners are able to develop the solution procedure
Solving the Problem	Learners are able to carry out the procedures that have been made in the previous step so that they can get a solution.
Checking Process and Results Again	Learners are able to carry out evaluations as well as evaluate whether the procedures used and obtained are correct.

This study utilizes the Problem Based Learning model assisted by Google Sites where learners are exposed to contextual and relevant mathematical problems presented through the Google Sites platform. Google Sites serves as a structured digital platform, allowing teachers to present problem scenarios, supporting learning resources such as learning videos, teaching materials, or links to interactive simulations, as well as a space for learners to collaborate and collect their work.

The data collection instruments used include learner activities, teacher observation sheets, and the form of giving tests of problem solving skills at the end of all cycles. This test is given to students in the form of a description question which includes 4 questions as a measurement of students' problem solving ability according to problem solving indicators.

Data on students' mathematical problem solving skills are raised on the basis of the final evaluation test scores. The success indicators used for this study are: 1) the results of observations of teacher and student activities are at least categorized as good, 2) the acquisition of the final test score of the cycle as much as $\geq 75\%$ of students get a score of ≥ 70.

Research Results and Discussion

Results

The implementation of the action ended in the second cycle because it was in accordance with the criteria that had been desired from the beginning. Each cycle includes 4 stages including the steps of planning, implementing, observing, and reflecting. The implementation of all cycles runs a total of two meetings. Each cycle intended by the researcher includes:

Initial Condition

Before this class action research was carried out by the researcher, a preliminary study was carried out to find out the characteristics of students and the KBM process of class VIII-D in one of the public schools in Yogyakarta City in the 2024/2025 academic year. Furthermore, a diagnostic test of mathematical problem solving ability on SPLDV material was carried out. The purpose of the researcher conducting a diagnostic test of problem solving ability is in order to measure the extent of the mathematical problem solving ability of class students in class VIII-D. The test questions refer to the indicators measured to determine the level of students' mathematical problem solving ability. The

following is the acquisition of diagnostic tests of problem solving ability of class VIII-D students. Learners are declared in accordance with the indicator if they get the maximum score on all indicators of problem solving ability.

Table 3. Percentage of the Number of Learners Meeting Indicators of Problem Solving Ability on Diagnostic Tests

Problem Solving Ability Indicator	Learners who Met the KPM Indicator		KPM Class Average
	Number of Learners	Percentage	
Understanding the Problem	17	53.125%	66.07
Developing a Problem Solving Plan	9	28.125%	53.67
Solving the Problem	2	6.25%	51.08
Checking Process and Results Again	0	0%	33.92

Referring to these data, it can be seen that the low mathematical problem solving ability of students. In the indicator of understanding the problem, only 53.125% of the total VIII-D class students managed to write the information asked and known correctly for the given problem. In the indicator of developing a problem solving plan, only 28.125% of the 32 learners were able to write the problem solving idea correctly on the problem. For the problem solving indicator, only 6.25% of learners who correctly solve the problem completely, correctly, and systematically. While for the last indicator, namely checking the process and results again, no learners were found who were correct in interpreting the solution. The class average score for problem solving ability was found to be 50.14 with a percentage of completeness of 12.50%. Therefore, based on the test results, the average number of students who meet the problem solving ability indicators is still below 75% for each indicator. So, researchers innovate by developing learning methods that are called more effective, namely using the PBL model assisted by Google Sites as an improvement in the problem solving ability of VIII-D class students in one of the public schools in Yogyakarta City.

Cycle I

Action Planning

For the planning stage of cycle I, researchers carried out the preparation of learning devices in the form of teaching modules and LEARNER WORKSHEET. The material to be studied is SPLDV. The instrument sheet compiled is the activity of teachers and students throughout learning using PBL assisted by Google Sites along with test questions to evaluate cycle I activities.

Implementation of Action

In connection with the implementation stage, the researcher in this learning action acts as a teacher carrying out teaching and learning activities according to the teaching module that has been designed. A description of the results of SPLDV mathematics learning activities using PBL with the help of Google Sites can be presented.

Observation Results

In connection with this stage of the research, observations were carried out as observations of teacher activities, learner activities and the ability to solve students' problems. This observation was carried out by observers throughout the continuity of learning activities. Observations of learner and teacher activities were carried out through observation sheets that had been prepared. The results of observations during cycle I obtained that the teacher had carried out learning according to the steps found in the teaching module, some group members did not participate actively in the discussion process, students' understanding of each step of the LEARNER WORKSHEET work was still lacking, students

were still found who had difficulty when facing problem-solving skills questions, the time for implementing learning was not appropriate because the time allocation for discussion was too long so that during the presentation session it was not optimal because of limited time.

Referring to the exposure to the results of the evaluation of the implementation of actions in cycle I, data related to students' mathematical problem solving skills were obtained.

Table 4. Percentage of the Number of Learners Who Met the Problem Solving Ability Indicators in Cycle I

Problem Solving Ability Indicator	Learners who Met the KPM Indicator		KPM Class Average
	Number of Learners	Percentage	
Understanding the Problem	28	87.50%	80.00
Developing a Problem Solving Plan	24	75.00%	73.80
Solving the Problem	20	62.50%	73.11
Checking Process and Results Again	9	28.125%	58.57

Based on Table 4 above, it is obtained that there is an increase in the level of students' mathematical problem solving ability. Thus it can be reviewed based on the number of students who meet the indicators of problem solving ability in all indicators found an increase.

The ability to understand math problems increased compared to before the action was given there was an increase. For the problem solving ability test in cycle I that an average of 87.50% of students were able to meet the indicators of understanding the problem. Almost all students can write the information asked and known. For the ability to plan a problem solving model, the hope is that students can compile a mathematical model and represent it in an appropriate form to facilitate completion. Based on the results of the cycle I problem solving ability test, an average of 75% of students succeeded in meeting this indicator. In the third indicator, which requires students to solve math problems according to the steps that have been planned, an average of 62.50% of students meet this indicator. For the indicator of checking the process and results again, only 28.125% of 32 learners can fulfill it. Although the average of each problem solving indicator showed an increase compared to the results of the diagnostic test, the results on the third and fourth indicators were still not in accordance with the minimum learning completeness, namely $\geq 75\%$ of students scored ≥ 70.

Reflection

The reflection stage was carried out after the implementation of the action in cycle I ended. Referring to observations during the action research held twice a meeting, it can be presented, namely:

1. The apperception given by the teacher is still lacking, so it has an impact on some students with less enthusiasm when participating in learning from the beginning of the meeting.
2. Students are still not used to the Problem Based Learning learning model assisted by Google Sites because they tend to be accustomed to the center of learning which is still in the teacher.
3. Learners still cannot solve problems using steps to solve problems. The difficulties of students include not being able to write what is asked and known about the problem, not being able to change the problem to be used as a mathematical model, students' accuracy in calculations is still lacking, resulting in errors in the final results, and students have not been able to double-check

the solutions that have been done.

4. There are still some learners who show a passive attitude. They are shy and afraid to respond if only appointed. In addition, the condition of the class still looks less conducive. Thus, in cycle II it is very necessary to manage the class to make it more conducive. The ability of students in solving problems in cycle I and is classified as a medium category, which has a class average value of 70.79. There were 19 students who reached the level of learning completeness (59.38%), while those who had not reached were 13 students (40.63%).

As a remedy for various shortcomings and improving while maintaining the success achieved in cycle I, there are steps that are carried out in cycle II, namely:

1. Teachers motivate students more so that they are more interested in doing the tests given and also explain again the meaning of guided discovery math learning so that students are more enthusiastic in finding solutions to the problems given.
2. The teacher tries to make students actively discuss with their groupmates by explaining the importance of discussion with the group, namely so that students are easier in working on learner worksheet.
3. The teacher will go around and provide guidance to each member who is still confused can be overcome.
4. The teacher explains to students that there will be additional grades given, either in groups or individually in order to increase students' interest.
5. The teacher assigns high ability learners to provide guidance for friends in their group who do not understand the related problem solving.
6. The teacher gives more discussion questions and practice questions to each group to discuss.
7. The application of the problem solving stages is better explained and focused on students.
8. Conducting remedial activities for students who have not completed their learning, carried out before entering cycle II. The activities include:
    a. The teacher organizes students who have not completed their learning in groups of 5-6 people per group and consists of 6 groups.
    b. The teacher provides learners with more varied real-world related problems.
    c. The teacher guides the discussion and guides learners to use Polya's steps in solving the problems. The teacher uses the methods of question and answer, discussion, presenting interesting teaching materials and online quizzes on Google Sites and giving assignments.
    d. The teacher asks one of the groups to present the results of their discussion and the other groups respond.
    e. The teacher gives students the opportunity to ask questions and provide arguments to show the truth of the concepts that students have discovered.

Cycle II

Action Planning

For the planning stage of cycle II, researchers carried out the preparation of learning devices which were realized with teaching modules and learner worksheets referring to the reflection in cycle I. The material that was then studied, namely SPLDV, continued with the material in the previous cycle. The instrument sheet that was compiled was a student and teacher activity sheet throughout PBL learning utilizing Google Sites and test questions in evaluating cycle II.

Because this learning completeness has not been achieved, a problem was found in students when completing the problem solving ability test I. Therefore, cycle II is needed as a handling problem. Therefore, cycle II is needed as a handling problem, thus the hope is that in cycle II students will more easily understand SPLDV and also solve the problems presented. Referring to the reflection on silkus I that has been produced, a number of problems from cycle I were found that can be handled in cycle II actions including:

1. Learners have not completed the problem solving ability question.
2. Learners have not been able to form a solution plan, because:
    a. students have not been able to form a solution rule;
    b. learners forget about how to solve it.
3. Learners have not been able to carry out calculations as problem solving because the method of solving is not understood, thus the answer is still wrong.
4. Learners have not been able to analyze the results of the answer thus less able to double-check the results of their answers.
5. Lack of motivation of students in participating in learning.

Researchers at this stage outlined the action plan II as handling failures and shortcomings in the implementation of teaching and learning activities during cycle I.

1. Teachers prepare learner worksheets to help students understand the concept of SPLDV and solve SPLDV problems.
2. Arrange learning groups that include 5-6 people with heterogeneous abilities based on the results of the problem solving ability test in cycle I, with this it is hoped that students will be more active and can help each other in groups.
3. Researchers provide motivation for students so that they are willing to participate in the learning process better. Learners are also motivated to respond to every presentation and question and answer that is taking place. The teacher explains to students that additional grades will be given including in groups or individually so that there is an increase in the interest of students.
4. The researcher asked which parts had not been understood and explained to students who did not understand, the researcher also urged students to help each other in their respective groups.
5. Prepare learning support media in accordance with the actions taken, namely: a) teaching materials for students, b) learner worksheets, c) additional material in the form of e-books, learning videos and online quizzes on the Google Sites page which are presented more interestingly. In the learner worksheet made for cycle II, researchers added Polya's problem solving steps for each problem.
6. Preparing research instruments, namely: a) problem solving test used to see the level of mastery of students' mastery of the material of the system of linear equations of two variables, b) observation sheet of the teacher's ability to apply PBL assisted by Google Sites during teaching and learning activities.

Implementation of Action

For this stage of class action research, researchers who carry out actions like teachers stick to the teaching modules that have been designed based on the results of the reflection from cycle I. The organization of learning activities is similar to cycle I but will be improved according to the actions previously planned. A description of the results of mathematics learning activities using PBL assisted by Google Sites can be presented.

Observation Results

In relation to this stage of the study, observations are intended for learner activities, teacher activities, and learner problem-solving skills. Observations were carried out by observers throughout the continuity of learning activities. Observations were carried out through observation sheets that had been prepared previously. Observations of students' mathematical problem solving skills have been carried out through the final test of cycle II.

In cycle II, the learning process has changed for the better. The learning process in cycle II can influence students in gathering information, organizing problem-solving plans, orienting problems appropriately and solving problems through discussions among group members, as well as preparing the resulting group discussions and presenting in front of the class.

Because the learning process that is getting better in cycle II also has a significant impact on the results of the problem solving ability test. Broadly speaking, students' problem-solving skills increased when compared to cycle I and the diagnostic test before the action was given. The data on the results of this test for Cycle II can be seen as follows:

Table 5. Percentage of the Number of Learners Who Met the Problem Solving Ability Indicator In Cycle II

Problem Solving Ability Indicator	Learners who Met the KPM Indicator		KPM Class Average
	Number of Learners	Percentage	
Understanding the Problem	32	100.00%	91.07
Developing a Problem Solving Plan	32	100.00%	89.52
Solving the Problem	31	96.875%	85.00
Checking Process and Results Again	29	90.625%	77.14

Reflection

Referring to Table 5, information appears from an increase in the mathematical problem solving ability of students in class VIII-D in one of the public schools in Yogyakarta City from cycle I to cycle II. This is evident through the increase in the number of students who meet the indicators of mathematical problem solving ability. For the reflection stage of cycle II, referring to observations and student learning outcomes, it was shown that problem solving ability in the teaching and learning process increased. It can be seen that 31 students with a percentage of 96.875% who meet the Criteria for Achievement of Learning Objectives (KKTP) which is ≥ 70. The average class score in cycle II was obtained at 84.36.

The data on the results of improving students' mathematical problem solving skills after and before learning using the PBL model assisted by Google Sites on SPLDV material can be seen from Table 6.

Table 6. Recapitulation of Students' Problem Solving Ability Levels Diagnostic Test, Cycle I and Cycle II

Value Range	Category of Problem Solving Ability	Number of Learners			Percentage		
		Diagnostic Test	Cycle I	Cycle II	Diagnostic Test	Cycle I	Cycle II
90 - 100	Very good	0	2	13	0%	6.25%	40.625%
80 - 89	Good	1	7	11	3.125%	21.875%	34.375%
70 - 79	Enough	3	10	7	9.375%	31.25%	21.875%
50 - 69	Less	12	9	1	3.75%	28.125%	3.125%
0 - 49	Very Less	16	4	0	50%	12.50%	0%
Σ		**32**	**32**	**32**	**100%**	**100%**	**100%**
Number of students with score ≥ 70		4	19	31	12.50%	59.375%	96.875%

Referring to the data from Table 6, the conclusion is that students' mathematical problem solving ability for each qualification is found to have increased. In the diagnostic test results, the qualifications of students' mathematical problem solving skills were still classified as very poor. However, after the implementation of cycles I and II, only 1 out of 32 students as a whole was categorized as lacking.

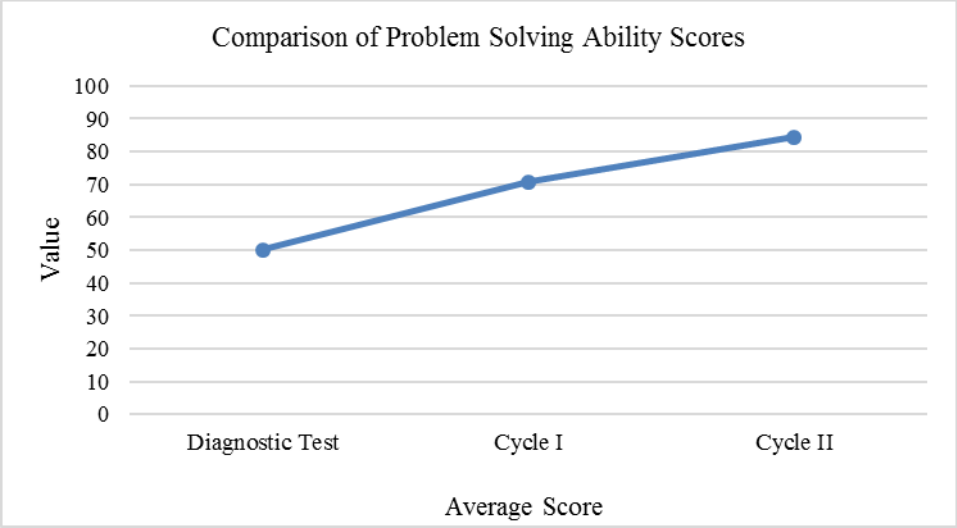

Figure 2. Comparison of Problem Solving Ability Score

In conclusion, researchers have been able to maintain and make improvements to the implementation of teaching and learning activities through the PBL learning model assisted by Google Sites that have been applied. This is based on the teaching and learning activities carried out by researchers getting better based on the observations of mathematics teachers. The cohesiveness between group members has improved so that enthusiasm for working on learner worksheet is very good, the questions and answers displayed during presentations and discussions are also getting better, students have the courage to express their ideas and opinions. Referring to the test results in the picture above, it can be seen that there has been an increase compared to before. It can be seen that students have an increased class average value. The class average score for the diagnostic test was 50.14, the problem solving ability in cycle I was 70.79 then in cycle II it was 84.36. Therefore, it was found that from cycle I to cycle II had an increase of 13.57. The average observation of learning management by teachers in cycle

I is 2.81 or can be said to include good criteria then for cycle II it has increased to 3.35 (very good criteria).

These results show that learning through the application of PBL assisted by Google Sites can increase the ability of students to solve math problems on SPLDV material. In line with the response of the observer (math teacher) who described learning through the PBL learning model assisted by Google Sites, the results were better than the learning that had been carried out until now. Through the application of problem solving steps in accordance with the PBL learning model assisted by Google Sites and the application of Polya's steps, it is easier for students to solve math problems.

Discussion

Referring to the analysis of the resulting data obtained: a) Observation of teacher activities in cycle I reached a result of 2.81 which has criteria into the "good" category, and the percentage reached 3.35 in cycle II or "very good", b) The final test of cycle I gave rise to a class average of 70.79 with a percentage of completeness of 59.375% which has criteria into the "good enough" category, and for cycle II to be worth 84.36 which has a percentage of completeness of 96.875% with "very good" criteria. Based on the analysis of the data generated, it shows that the application of the PBL model assisted by Google Sites can support the improvement of students' ability to solve problems, where this explanation can be proven through the results of the study, which shows that after the application of the model it has increased from cycle I to cycle II. This opinion is also supported by the opinion of Duch (in Shoimin, 2017, p. 130) which explains that, "Problem Based Learning (PBL) is a teaching model characterized by real problems as a context for students to learn critical thinking and problem solving skills and gain knowledge". This is because in the learning process with this model students are required to be actively involved in teaching and learning activities. This opinion is in line with the opinion that has been revealed by Yusri (2018) that students' mathematical problem solving abilities have increased through the application of the PBL model because it creates space so that there is active involvement of students in finding solutions and discussing different approaches in groups. This research indicates that students who learn through PBL show better results than conventional models, because it prioritizes social interaction and collaboration between students that enrich their learning experience. PBL emphasizes learning based on relevant problems, where learners are faced with real situations that require solving, thus they learn to apply mathematical concepts in a practical context.

While Google Sites as part of Google products in the form of a website that can be utilized as learning media. Through Google Sites, it will be able to influence students to be more interested and excited when participating in learning. This appears to refer to the results of interviews that have been conducted by researchers, obtained 5 out of 6 students or 83% of students interviewed are happy with the application of the PBL model assisted by Google Sites. This opinion is also supported by the opinions of other researchers who explain the benefits of Google Sites, namely according to Tarno et al., (2023) that the use of learning media assisted by Google Sites in teaching and learning activities can make students easier to understand the material, where they can download material and learn anytime and anywhere, making it a very adaptive tool for modern learning needs. In line with this, Widyastuti et al. (2022) explain how Google Sites allows learners to access materials more easily and is integrated with various other digital resources, such as YouTube videos, which enrich their learning experience. Through the use of Google Sites, learners not only receive materials, but they also actively participate in the learning process that supports their digital skills.

Utilizing Google Sites in mathematics learning not only provides a platform for teachers to create better teaching materials, but also offers opportunities for learners to collaborate, interact and make improvements to their understanding of mathematical concepts. With proper utilization and technological support, Google Sites can be an effective tool to improve the quality of mathematics learning.

Conclusion

Referring to the analysis of the data generated, the researcher raises a conclusion about Problem Based Learning assisted by Google Sites that has been applied to be able to make an increase in the ability to solve mathematical problems for class VIII-D students in one of the public schools in Yogyakarta City, namely through the division of each group including 5-6 people, bringing up a number of problems related to the real world that are more diverse through the use of Google Sites, there are rewards given by the teacher to the best group, always holding reflections and evaluations at the end of the learning that has been carried out, thus difficulties that have an impact on the success of learning both experienced by teachers and students in this learning can be handled quickly. Thus it appears based on the increase in the problem solving ability of students with a score of 37.50% from 59.38% in cycle I and in cycle II it reached 96.88%. In addition, out of 32 learners in cycle I there were 19 people who improved in problem solving skills while in cycle II it increased again, namely 31 people. The class average for cycle I was 70.79 and in cycle II it was 84.36, thus the average value that increased was 13.57. The average observation of learning management by teachers in cycle I was 2.81 which was included in the good criteria then for cycle II it increased to 3.35 (very good criteria).

References

Adam, N., Hi Rahman, M., & Sukmawati Yusuf, D. A. (2023). Analisis Respon Guru Dan Peserta didik Terhadap Pengembangan Bahan Ajar Fisika Berbasis Model POE2WE Berbantuan Google Site. *EDUKASI*, *21*(3), 579–591.

Amam, A. (2017). Penilaian Kemampuan Pemecahan Masalah Matematis Peserta didik SMP. *Teorema, 2*(1), 39–41.

Arifin, Zainal. 2009. *Evaluasi Pembelajaran*. Bandung: PT Remaja Rosdakarya.

Damianti, E., Sutrisno, H., & Rahmawati, D. (2022). Penerapan Model Pembelajaran Inovatif untuk Meningkatkan Kemampuan Pemecahan Masalah Matematika Peserta didik. *Jurnal Pendidikan Matematika dan Sains*, 12(2), 112–123.

Hadi, S., Retnawati, H., Munadi, S., Apino, E., & Wulandari, N. F. (2018). The Difficulties of High School Students In Solving Higher-Order Thinking Skills Problems. *Problems of Education in the 21st Century*, *76*(4), 520–532.

Hanipa, A., & Sari, V. T. A. (2017). Analisis Kesalahan Peserta didik dalam Menyelesaikan Soal Sistem Persamaan Linear Dua Variabel pada Peserta didik Kelas VIII MTs Di Kabupaten Bandung Barat. *Jurnal On Education*, *01*(02), 15–22.

Islamiyah, A. C., Prayitno, S., & Amrullah, A. (2018). Analisis kesalahan peserta didik smp pada penyelesaian masalah sistem persamaan linear dua variabel. *Jurnal Didaktik Matematika*, 5(1), 66–76. https://doi.org/10.24815/jdm.v5i1.10035.

Isnaeni, S., Ansori, A., Akbar, P., & Bernard, M. (2018). Analisis Kemampuan Koneksi Matematis Peserta didik SMP Pada Materi Persamaan dan Pertidaksamaan Linear Satu Variabel. *Journal On Education*, *01*(02), 309–316.

Kemmis, S., McTaggart, R., & Nixon, R. (2014). The action research planner: Doing critical participatory action research. *The Action Research Planner: Doing Critical Participatory Action Research*, 1–200. https://doi.org/10.1007/978-981-4560-67-2.

Khasanah, A., & Rizka Amalia, S. (2023). *Media Pembelajaran Matematika Berbasis Google Sites Berbantuan Quizizz Terhadap Kemampuan Pemahaman Konsep Matematis Peserta didik SMK* (Vol. 10, Issue 2).

Krisna, E. D., & Mery Marlinda, N. L. P. (2020). Implementasi Problem Based Learning berbantuan Google Classroom Untuk Meningkatkan Prestasi Belajar Matematika. *PENDIPA Journal of Science Education*, *4*(3), 91–97.

Lestari, S. &. (2020). *Soal Cerita Pada Materi Sistem Persamaan Linear Dua*. *04*(01), 286–293.

Napitupulu dan Mansyur. (2011). Kemampuan Pemecahan Masalah Matematis Siswa. Generasi Kampus, 4 : 139-148.

Nurmilah, A. S., Karlimah, K., & Rahmat, C. (2023). Kemampuan pemecahan masalah matematis peserta didik sekolah dasar dengan pendekatan matematika realistik. *JIIP - Jurnal Ilmiah Ilmu Pendidikan*, 6(8), 5911–5916. https://doi.org/10.54371/jiip.v6i8.2661.

Salenussa, M., Setyawan, F., & Sugiyem. (2022). Upaya Meningkatkan Kemampuan Pemecahan Masalah Matematika Peserta Didik Melalui Model Pembelajaran Problem Based Learning pada SMA Negeri 14 Ambon. *Sora Journal of Mathematics Education*, *3*(1), 34–42.

Santoso, I. B., Sholihah, U., & Asmarani, D. (2024). Commognitive peserta didik pada pemecahan masalah materi spldv di smk pgri kras kediri. *PERISAI: Jurnal Pendidikan Dan Riset Ilmu Sains*, 3(1), 37–48. https://doi.org/10.32672/perisai.v3i1.622.

Shoimin, A. (2017). *Inovasi Pembelajaran: Konsep dan Aplikasi*. Jakarta: Radja Grafindo Persada.

Sukmawati, A. (2020). Meta analisis model problem based learning dalam meningkatkan kemampuan berpikir kritis pada pembelajaran matematika. *Thinking Skills and Creativity Journal*, 3(2), 63–68. https://doi.org/10.23887/tscj.v3i2.30211.

Tarno, I., Fatnah, N., & Taufik, L. M. (2023). Pengembangan media pembelajaran berbasis google sites pada materi cahaya kelas viii smp. *PENDIPA Journal of Science Education*, 7(1), 100–105. https://doi.org/10.33369/pendipa.7.1.100-105.

Widyastuti, W. T., Ratna, R., & Dewi, E. R. (2022). Materi keterampilan membaca bahasa prancis tingkat a1 untuk pengembangan model pembelajaran berbasis google sites. *Edukasi: Jurnal Pendidikan*, 20(2), 181–194. https://doi.org/10.31571/edukasi.v20i2.4034.

Yusri, A. Y. (2018). Pengaruh model pembelajaran problem based learning terhadap kemampuan pemecahan masalah matematika peserta didik kelas vii di smp negeri pangkajene. *Mosharafa: Jurnal Pendidikan Matematika*, 7(1), 51–62. https://doi.org/10.31980/mosharafa.v7i1.341.

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