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Mathematical Problem Solving Ability Reviewed from Habits of Mind Through Problem Based Learning Model Assisted with Wordwall Education Game

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Abstract

This study aims to test the effectiveness of the Problem Based Learning model assisted by Wordwall Education Game and describe mathematical problem solving skills when viewed from habits of mind. The research method used is a mixed method with the sequential explanatory model. The research population was all students of class VII of SMP Negeri 22 Semarang, the research samples were class VII G as the experimental class and VII H as the control class. The research subjects were students of class VII SMP N 22 Semarang consisting of 2 students based on each level of habits of mind. The results showed that the Problem Based Learning model assisted by Wordwall Education Game was effective on mathematical problem solving ability, namely students in the experimental class could achieve learning completeness, mathematical problem solving ability in the experimental class was better than the control class, and the proportion of students in the experimental class was better than the control class. Then the qualitative description shows that students who have a high level of habits of mind can fulfill all indicators of mathematical problem solving ability, students with a moderate level of habits of mind fulfill 3 indicators of mathematical problem solving ability, and students who have a low level of habits of mind do not fulfill all indicators of mathematical problem solving ability.

1. Introduction

Education is defined as a right of every Indonesian nation which must be realized by the government because it has an important goal in the progress of a country (Winata et al, 2021). This education has an important role so that in order for the goals of education to be achieved, an education system is needed that supports achieving this in learning activities for students. Education plays an important role in the progress of a nation. This is because good quality education influences the quality or excellence of human resources in Indonesia. Mathematics subjects are material that requires understanding and application so students need to master them well. Mathematics is an abstract science. Mathematics is important to study because 1) by studying mathematics you are expected to be able to do calculations well; 2) is expected to be able to train mathematical skills and develop logical thinking; and 3) mathematics is a prerequisite material for other subjects (Isnaeni, 2019).

Based on research conducted by the National Council of Teachers of Mathematics (2000), students must have standard processes in learning mathematics, including (1) problem solving, (2) reasoning and proof, (3) communication.), (4) representation, and (5) connection. Therefore, problem solving ability is one aspect of the ability that students need to master in learning mathematics. Problem solving is an important aspect of mathematics learning which is related to growing students' interest and self-confidence in solving mathematical problems. Students who have the ability to solve mathematical problems tend to have an understanding of making good contextual considerations (La'ia & Harefa, 2021). This is in line with

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research by Rahmadi (2015) which states that problem solving is an important aspect needed in mathematics learning because it encourages students to use their knowledge and skills in solving non-routine problems. Problem solving is an important aspect for teachers and students at various levels.

Problem solving ability is one of the basic abilities that must be possessed in the learning process at school. During the learning process, teachers encourage and provide stimulus to students so they are able to solve problems creatively (Mariam et al., 2019). This is in line with research by Rambe & Afri (2020) which states that the ability to solve a problem is the ability to solve problems in a non-routine and complex manner. As stated by Polya (2004), there are 4 stages in solving problems systematically. The stages are (1) understanding the problem, (2) planning a strategy to solve the problem, (3) implementing the plan, and (4) checking the answers that have been obtained. Branca (1980) states that the importance of having the ability to solve a problem includes 1) the ability to solve problems is one of the general goals in learning mathematics, 2) solving a problem is a basic ability that students must have, and 3) one of the processes The main and core part of mathematics learning is problem solving which consists of procedures, strategies and methods.

The importance of the ability to solve a problem mathematically is not matched by the optimization of students in achieving it (Nurhasanah & Luritawaty, 2021). In fact, students' ability to solve problems mathematically is still relatively low. Based on the results of a survey conducted by PISA (Program for International Students Assessment), it shows that in 2018, the score obtained was relatively low, which did not reach a score of 400 and did not experience significant progress from the previous year. In line with this, based on the results of Trends in International Mathematics and Science (TIMSS) showed that Indonesia was ranked 73 out of 79 countries or obtained a position from the bottom 7. The average score obtained is only 397 (Fauziah et al., 2022). Therefore, in the field of education Indonesia must optimize aspects of problem solving skills in learning mathematics. This is because, PISA and TIMSS can be used to measure mathematical problem solving skills.

Based on the results of interviews with Mrs. Sulastri as a mathematics teacher at SMP Negeri 22 Semarang stated that students' mathematical problem solving skills were in the low category. Students tend to have difficulty in solving mathematical problems, especially when solving non-routine problems. When given contextual problems, students still have difficulty in analyzing or identifying problems. In the process of solving problems, most students do not write down the information contained in the problem. Students tend to only write down problems or mathematical problem information if asked by the teacher. This shows that students lack mathematical problem solving skills. The majority of students still have difficulty in solving problems regarding addition operations with multiplication. In addition, students still have difficulty in recognizing the number of terms. Then, when working on mathematical problems that are categorized as difficult students tend to give up easily so that they answer carelessly not based on the concepts taught. In addition, students are less careful or quite negligent in solving mathematical problems.

Then, based on the results of the documentation of the daily test assessment of students in class VII E regarding the question of mathematical problem solving ability on whole number material, it shows that only 12 students out of 34 students who get a complete score by Achievement Of Learning Objectives. The results of student work on mathematical problem solving in integers can be presented in Figure 1.

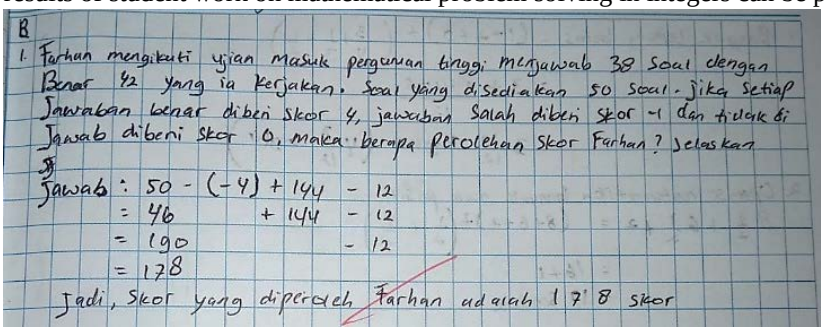
B
1. Farhan mengikuti ujian masuk perguruan tinggi menjawab 38 soal dengan benar 42 yang ia kerjakan. Soal yang disediakan 50 soal. Jika setiap jawaban benar diberi skor 4, jawaban salah diberi skor -1 dan tidak di jawab diberi skor 0, maka berapa perolehan skor Farhan? Jelaskan
Jawab : 50 - (-4) + 144 - 12
= 46 + 144 - 12
= 190 - 12
= 178
Jadi, skor yang diperoleh Farhan adalah 178 skor

Figure 1. Daily Test Essay Question Number 1

Based on Figure 1 above, it can be shown that students are still mistaken in answering mathematical problem solving ability questions on whole number material. The students' mistakes in solving problems include (1) students still cannot understand the problem given properly. This can be shown that students do not write down the known and questionable problem information, (2) students do not make mathematical

models and tend to directly solve problem problems, (3) the problem solving strategy used by students is still inappropriate, and (4) the conclusion of the answer to solving the problem above is not correct.

One of the internal factors that affect students' ability to solve problems mathematically is habits of mind. Ramlah & Maya (2018) stated that habits of mind can make a positive contribution to students' mathematical problem solving skills. Habits of mid is hopefully an attitude that can play an important role in learning mathematics. The habit patterns of these habits of mind include awareness of their own thoughts, being able to make plans efficiently, having good sensitivity to the feedback provided, being able to optimize existing resources, and being able to evaluate every action that has been taken. Getting used to thinking mathematically can develop students' mathematical problem solving skills. This habit of thinking is also able to help someone in using their knowledge or thinking in finding contextual problems given (Susanto, 2020). Millman and Jacobbe (2008) stated that there are 6 components of learning strategies in developing students' habits of mind. The strategies used are 1) being able to explore various kinds of ideas and ideas mathematically, 2) being able to reflect on answers to problems given, 3) analyzing strategies that need to be applied in learning, 4) conducting self-evaluation of activities that have been carried out, 5) formulating questions, and 6) constructing examples. Habituation of thinking that is carried out on an ongoing basis is expected to be able to form student characters which include self-confidence, diligence, thoroughness, being able to think flexibly or flexibly, working hard, and fostering student attitudes towards mathematics.

Mathematical problem solving skills can be developed through appropriate and effective learning models. Dewi & Septa (2019) in their research stated that the Problem Based Learning model is a solution in developing students' ability to solve mathematical problems. In mathematics learning, not only transferring cognitive knowledge but also being able to build student knowledge. During this problem-based learning process, students are first introduced and given a problem. In line with research conducted by Amris & Desyandri (2021), it is stated that the Problem Based Learning model encourages students to be actively involved in classroom learning and be able to use their knowledge and skills in solving a problem. Student activeness during the learning process can have a positive effect on learning outcomes. In addition, the Problem Based Learning model can improve social skills, critical thinking skills, and find mathematical problem solving through the discussion method.

Efforts to develop mathematical problem solving skills can also be supported by interactive learning media. One of the media supporting learning in the classroom is collaborative learning using wordwall media. Wordwall is a website-based interactive learning media designed like an interactive game. This media can support during the learning process in the classroom because students can answer quizzes, surveys, and discussions through the features provided. The use of this media is easily accessible because students can access directly through the website or application through the link that has been given (Widowati et al., 2022). This is in line with the opinion of Gandasari & Pramudiani (2021) who state that wordwall is a supporting application during the learning process in the classroom which contains interactive gamification games and provides positive student responses during the learning process. Fajrin & Pramadi (2022) stated that (1) the use of wordwall media in learning mathematics can improve students' ability to solve a problem with the average results of their ability in the good category, (2) based on the results of student response questionnaires related to the use of wordwall media in learning mathematics, it shows that on average students strongly agree that the use of this media is able to make the classroom atmosphere active, the material presented is easy to remember, and increase enthusiasm for learning.

Based on the description above, this study is used to determine the mathematical problem solving ability of students in view of Habits of Mind at SMP Negeri 22 Semarang. This study was conducted to analyze the effectiveness of the implementation of the Problem Based Learning model assisted by Wordwall Education Game on students' mathematical problem solving skills and describe students' mathematical problem solving skills assisted by Wordwall Education Game in terms of habits of mind.

2. Methods

The approach used in this research was a combination approach or what was known as a mixed methods approach. According to Cresswell (2012), the mixed methods approach was a procedure or stage in collecting, analyzing, and combining qualitative and quantitative research methods in a study. In this study, the model used was the sequential explanatory mixed methods model. The stages in conducting this research were collecting and analyzing quantitative data first and then analyzing qualitative data which aims to strengthen the results of data analysis carried out at the previous stage by explaining in detail through qualitative research. In this study, the quantitative research design used was a quasi-experimental

design with a post-test only control design. While the qualitative research design used is descriptive qualitative.

This research was conducted at SMP Negeri 22 Semarang on January 30, 2024 until February 28, 2024. The population in this study were all seventh grade students of SMP Negeri 22 Semarang in the academic year 2023/2024 odd semester. The research sample was class VII G as the experimental class and class VII H as the control class with 30 students each. The sampling technique was random sampling technique. In this study, class VII G as the experimental class will be given the learning treatment with the Problem Based Learning model assisted by the wordwall education game while class VII H as the control class will be given the Discovery Learning treatment. Taking research subjects using purposive sampling technique. Determination of the research subject is by selecting 2 experimental class students at each level of habits of mind (high, medium, and low).

The data collection techniques in this study were 1) written test: aims to obtain data on the test results of students' mathematical problem solving abilities, 2) questionnaire: to find out the ability to solve mathematical problems in terms of habits of mind, 3) literature study: collecting various kinds of references or literature both from articles, books and other sources used as supporting data in research, 4) interviews: to obtain mathematical problem solving data. Interviews were conducted after students took the mathematical problem solving ability test and after students were classified based on the level of habits of mind, and 5) documentation: one of the qualitative data collection techniques by collecting data on student work test results, data on daily test scores, and other data used during the study. Data analysis used in this research is quantitative data analysis and qualitative data analysis. Quantitative data analysis consists of initial data analysis and final data analysis. Initial data analysis includes normality test, homogeneity test, and two means similarity test. While the final data analysis includes normality test, homogeneity test, right one-party average test and proportion test to test learning completeness, two mean difference test, and two proportion difference test. Meanwhile, qualitative data analysis consists of data reduction, data presentation, and verification.

3. Results & Discussions

3.1 The Effectiveness of Using Problem Based Learning Model Assisted by Wordwall Education Game on Mathematical Problem Solving Ability

The implementation of the research was carried out for four lessons. Class VII G as the experimental class was given learning with the PBL model assisted by Wordwall Education Game while class VII H was given learning with the Discovery Learning model. The learning material at the first meeting was calculating the average for single data, the second meeting was calculating the median for single data, the third meeting was calculating the mode for single data, and the fourth meeting was a test of mathematical problem solving ability. During the learning process, students were very enthusiastic and quite active in asking questions, expressing opinions, and answering problems given by the teacher. The implementation of the mathematical problem solving ability test was attended by 30 students of VII G and VII H. The number of questions consists of 5 questions with the allocation of test time given is 60 minutes.

After the test was completed, an interview was conducted based on the categorization of habits of mind. Determination of this research subject is based on the results of the problem solving ability post test and the results of the habits of mind questionnaire. The questionnaire was filled out on Tuesday, February 13, 2024. The results of the questionnaire were then analyzed using standard deviation or standard deviation. The results of the habits of mind questionnaire analysis can be seen in Table 1.

Table 1. Habits of Mind Questionnaire Categorization Results

Habits of Mind Category	Number of Students
Low	2
Medium	21
High	7
Total	30

Subjects T-01 and T-13 were selected as research subjects in the high habits of mind category. This was determined based on high habits of mind questionnaire scores compared to other students, active students

during the learning process, often actively asking questions or answering the problems given, having good communication, and suggestions from the Mathematics teacher. Then S-22 and S-30 were used as research subjects in the medium habits of mind category. The determination of this research subject is based on the habits of mind questionnaire score which shows students in the moderate category, during the learning process students are less active in asking questions or answering questions, have a fairly good level of communication, and based on the advice of the Mathematics teacher. Finally, R-14 and R-08 were selected as research subjects in the low habits of mind category. This is because the habits of mind questionnaire score obtained is low compared to other students, students are less or not active during learning, students are passive when answering questions, students never answer questions given by the teacher, have a poor level of communication, and are selected based on the advice of the Mathematics teacher. The complete determination of research subjects can be seen in Table 2.

Table 2. Determination of Research Subjects

No	Student Code	Subject Code	Habits of Mind Group
1.	E-22	T-01	High
2.	E-24	T-13	High
3.	E-16	S-22	Medium
4.	E-18	S-30	Medium
5.	E-06	R-14	Low
6.	E-25	R-08	Low

The next step is to analyze the data. Based on the results of preliminary data analysis using data from the daily test scores of VII G and VII H of SMP Negeri 22 Semarang in the academic year 2023/2024, it shows that both classes, namely the experimental class and the control class, come from a normally distributed population, both classes have the same variance. In addition, there is no significant difference in the average score between the two classes. So it can be said that the two classes, namely the experimental class and the control class, have the same initial average ability.

Then, after analyzing the initial data, the next stage is to carry out the final data analysis. The data used is the data from the mathematical problem solving ability post test results tested in class VII G as the experimental class and class VII H as the control class.

Table 3. Final Data Normality Test Results

Data	Class	*Kolmogorov-Smirnov*		
		Statistic	***df***	***Sig.***
Posttest Score	Experiment	0.146	30	0.101
	Control	0.134	30	0.179

Based on the calculation results in the table above, it is obtained that the sig value in the experimental class is $0.101 > 0.05$ while the control class posttest value has a sig value of $0.179 > 0.05$ so that H_0 is accepted. Therefore, it can be interpreted that the experimental class and control class come from a normally distributed population.

Table 4. Final Data Homogeneity Test Results

Data	Class	*Based on Mean*			
		Levene Statistic	***df1***	***df2***	***Sig.***
Posttest Score	Experiment and Control	3.593	1	58	0.063

Based on the calculation results in the table above, both classes have a sig value. Based on Mean of $0.063 > 0.05$ so that H_0 is accepted. Therefore, it can be interpreted that both classes, namely the experimental class and the control class, come from a homogeneously distributed population or both classes are homogeneous.

Table 5. Learning Completeness Test Results

Average (μ)	N	t_{count}	$t_{0,95;58}$	Criteria	Summary
84.83	30	8.42	1.69	$t_{count} > t_{0.95;30}$	$\mu > 75$

The average posttest score in the experimental class is 84.83 with a standard deviation value of 6.40 so that the $t_{count} = 8.42 > t_{table} = 1.69$ is obtained, then H_0 is rejected. This means that the average posttest value of students' mathematical problem solving skills using the PBL model assisted by wordwall education games is more than 75. This can be interpreted that students have completed the achievement of learning objectives.

Table 6. Classical Completeness Test Results

Proportion (π)	z_{count}	$z_{0,5-0,05}$	**Criteria**	**Summary**
0.745	2.79	1.64	$z_{count} \geq z_{0.5-\alpha}$	$\pi > 0.745$

Based on the calculation results obtained that $z_{count} = 2.79 > z_{0,5-\alpha}$= 0.1736, then H_0 is rejected. So, it can be concluded that the proportion of students who scored ≥75 after being given the Problem Based Learning model assisted by the wordwall education game has exceeded 75% classical completeness.

Table 7. Results of Two Mean Difference Test

$\overline{x_1}$	$\overline{x_2}$	t_{count}	$t_{1-0,05;52}$	**Criteria**	**Summary**
84.83	75.67	6.14	1.67	$t_{count} > t_{(1-\alpha);(n_1+n_2-2)}$	$\mu_1 > \mu_2$

The results of the calculation, obtained the value of $t_{count} = 6.14 > t_{1-0.05;52} = 1.67$, then reject H_0. So, the average posttest value of mathematical problem solving ability using the Problem Based Learning model assisted by wordwall education game is more than the average posttest value of mathematical problem solving ability using the discovery learning model.

Table 8. Results of Two Proportion Difference Test

Class	x	n	z_{count}	z_{tablel}	**Criteria**
Experiment	29	30	3.486	1.64	H_0 rejected
Control	14	30			

Based on the calculation results obtained $z_{count} = 3.466$, while with $\alpha = 5\%$ and from the standard normal distribution list obtained $z_{table} = 1.64$. Because $z_{count} = 3.486 > z_{table} = 1.64$, then H_0 is rejected. So the proportion of students' mathematical problem solving ability after being given learning with the Problem Based Learning model assisted by Wordwall Education Game is better than the proportion of students' mathematical problem solving ability through the Discovery Learning model.

3.2 Description of Mathematical Problem Solving Ability Viewed from Habits of Mind through Problem Based Learning Model Assisted by Wordwall Education Game.

Describing students' mathematical problem solving ability in terms of habits of mind is done through data triangulation. The data used were the mathematical problem solving ability test results and interview data. The stage taken is to first analyze the results of the mathematical problem solving ability test according to the indicators. The indicators used are 1) Understand the problem, (2) Create a mathematical model and formulate a strategy to solve the problem, (3) Perform calculations correctly and check the answer again, and (4) Conclude the answer. Then, the results of student interviews at each level of habits of mind were analyzed.

The following is one of the answers of students who have high, medium, and low levels of habits of mind after being given the Problem Based Learning model assisted by Wordwall Education Game. Based on Figure 2, it can be shown that in the students' answers to question number 1, students have very good abilities in the indicator of understanding the problem. Learners are able to write down the known and questionable problem information. Students are able to describe the data on children's shoe numbers that represent POR and are able to write down the question information asked. Then in the indicator of making mathematical models and formulating strategies to solve problems, students are able to make plans using the average formula. In the indicator of carrying out the plan to do the calculations correctly and check the answers, students are able to write the solution steps correctly. Learners are able to determine the average by using the formula correctly and substituting existing data into the average formula. Finally, at the stage of concluding the answer, students write the answer conclusion correctly.

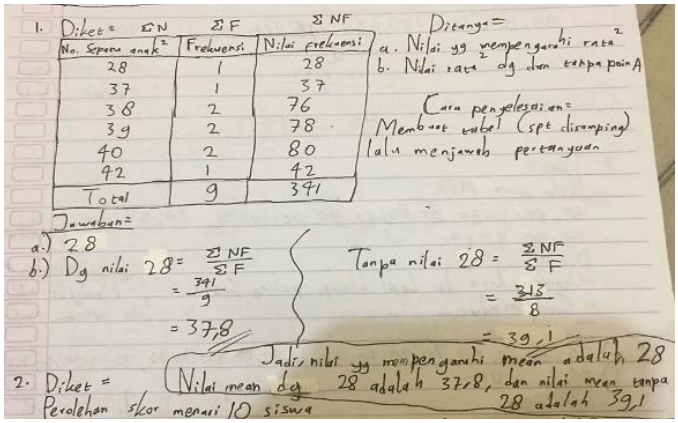

Figure 2. Students' Answers with High Habits of Mind

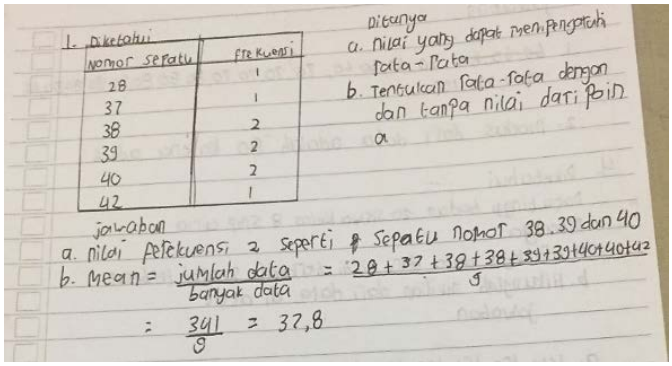

Figure 3. Students' Answers with Medium Habits of Mind

Based on Figure 3, it can be analyzed using mathematical problem solving indicators. The results of the analysis are that in the indicator of understanding the problem, students are able to understand the problem well by writing the known and questionable problem information. Then on the indicator of making mathematical models and formulating strategies to solve problems, students write a solution strategy plan for the problem. In the indicator of performing calculations correctly and re-examining answers, students are less able to solve problems coherently and correctly. At point a, the answers written by students are less precise while at point b, students are incomplete in writing the answers. Finally, at the stage of concluding the answer, students did not write the conclusion of the answer.

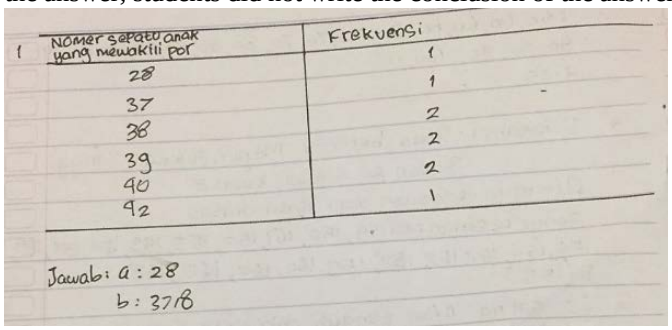

Figure 4. Students' Answers with Low Habits of Mind

Based on Figure 4, it can be analyzed using indicators of mathematical problem solving ability. The results of the analysis are that in the indicator of understanding the problem, students are able to understand the problem well by writing the known problem information while the questioned problem information is not written. The known problem information is the number of children's shoes that represent POR. Then in the indicator of making mathematical models and formulating strategies to solve problems, students do not write the solution strategy plan of the problem. In the indicator of performing calculations correctly and re-examining answers, learners are less able to solve problems coherently and correctly. At point a, the answers written by students are less precise while at point b, students' answers are also incomplete and not written

systematically. Finally, at the stage of concluding the answer, students do not write the conclusion of the answer obtained.

Mathematical problem solving ability at each level of habits of mind can be presented in Table 9.

Table 9. Mathematical Problem Solving Ability of Each Level of Habits of Mind

Indicator	Habits of Mind Levels		
	High	**Medium**	**Low**
1. Understand the problem	Able	Able	Less able
2. Create mathematical models and formulate strategies to solve problems	Able	Less able	Not Able
3. Performs calculations correctly and double-checks answers	Able	Able	Not Able
4. Summarizing the answer	Able	Less able	Not Able

Table 9 shows that students who have a high level of habits of mind are able to master all indicators of mathematical problem solving ability including (1) Understanding the problem, (2) Making mathematical models and formulating strategies to solve problems, (3) Performing calculations correctly and re-checking answers, and (4) Concluding answers. This is in line with Masni's research (2017) which states that students who have high problem solving skills have high mathematical thinking habits, students who have moderate problem solving skills have moderate mathematical thinking habits and students who have low problem solving skills have low mathematical thinking habits. This means that the high and low mathematical problem solving ability of students is related to their mathematical habits of mind. Then students with high, medium, and low habits of mind are mostly able to master the indicators of understanding the problem. Students are able to understand the problem well by writing down the known and questionable information.

In the indicator of understanding the problem, students with high and medium habits of mind are able to understand the problem well. While students with low habits of mind are less able to understand the problem well. Based on the results of test analysis and interview results, students with high and moderate habits of mind are able to explain the problem using their own sentences, are able to know the information known, know the information asked, and other information in the problem. Meanwhile, students with low habits of mind are less able to explain the problem in question, do not write down the known and questionable information, and do not know the information contained in the problem. Students are able to understand the problem quite well because learning is carried out problem-based. During the learning process, students are given a problem that is done together with their respective groups. In addition, the teacher also provides guidance to students, if students have difficulty in solving problems.

In the indicator of making mathematical models and formulating strategies to solve problems, students with high habits of mind are able to make mathematical models and formulate strategies to solve problems well. Students with moderate habits of mind tend to be less able to make mathematical models and formulate strategies to solve problems. Meanwhile, students with low habits of mind are not able to make mathematical models and formulate strategies to solve problems. This is in line with the research of Sari & Wijaya (2017) which states that most students have difficulty in analyzing the facts contained in the problem which are then connected to relevant mathematical concepts. Thus, students generally misinterpret problems into mathematical models.

On the indicators of performing calculations correctly and re-checking answers, students with high and medium habits of mind were able to master these indicators. Meanwhile, students with low habits of mind were not able to master the indicators of performing calculations correctly and re-checking answers. Students with high and medium habits of mind are able to use their knowledge, namely linking what is known in the problem with the solution plan. So that they are able to solve problems coherently and correctly. Students who are able to relate problem information to the solution plan can be indicated that they have good awareness as well. This is in line with Aufa's research (2023) which states that students who have good awareness tend to be easy in solving problem solving problems. So it allows students to be able to solve problems coherently and correctly. In addition, the correctness of the answer is also closely related to student accuracy. This is in line with the research of Novianti & Dasari (2023) which states that students with high habits of mind tend to be thorough in solving mathematical problems.

Students with low habits of mind tend to have difficulty in solving mathematical problems. Students are unable to master the indicators of performing calculations correctly and re-examining answers. Students'

inability to solve problems is usually influenced by students not being able to make mathematical models and formulate strategies to solve problems, and not being able to relate known problem information to making mathematical models. This is in line with Azmi & Yunita's research (2022) which states that students' inability to carry out problem solving when students are unable to determine the formula or concept used.

Finally, on the indicator of concluding answers, students with high habits of mind are able to conclude answers. Students with moderate habits of mind were less able to conclude the answer. Meanwhile, students with low habits of mind were not able to conclude the answer. Based on the interview results, students with moderate and low habits of mind generally do not write the conclusion of the answer because they are not used to writing the conclusion of the answer in writing. Students tend to use formula reasoning without writing the answer conclusion. This is in line with Amanda & Ruli's research (2022) which states that students are satisfied and satisfied with the results obtained without checking back.

4. Conclusion

Based on the results of research in the field regarding mathematical problem solving skills in terms of habits of mind through the PBL learning model assisted by Wordwall Education Game, it is concluded (1) The Problem Based Learning model assisted by Wordwall Education Game is effective on students' mathematical problem solving skills, and is detailed as follows: (a) The mathematical problem solving ability of students in the PBL learning model assisted by Wordwall Education Game has reached individual completeness, namely 75, (b) The proportion of students in learning with the PBL model assisted by Wordwall Education Game has reached classical completeness, namely 75%, (c) The mathematical problem solving ability of students through the PBL learning model assisted by Wordwall Education Game is better than the mathematical problem solving ability of students in learning with the Discovery Learning model, and (d) The proportion of students who are complete in learning with the PBL model assisted by Wordwall Education Game is more than the proportion of students who are complete in the Discovery Learning model. (2) Description of students' ability to solve problems in terms of habits of mind through the Problem Based Learning model assisted by Wordwall Education Game is as follows: (a) Students who have a high level of habits of mind tend to have the ability of students to solve good problems. This can be shown by the fulfillment of all indicators of students' ability to solve problems including (1) understanding the problem, (2) making mathematical models and formulating strategies to solve problems, (3) performing calculations correctly and re-checking answers, and (4) concluding answers, (b) Students who have a moderate level of habits of mind tend to have the ability of students to solve sufficient problems. This can be shown by only fulfilling three problem solving ability indicators. There are differences in the indicators mastered by the 2 subjects. The indicators mastered by subject S-22 include (1) understanding the problem, (2) making mathematical models and formulating strategies to solve problems, and (3) performing calculations correctly and checking the answers again. While the indicators mastered by subject S-30 include (1) understanding the problem, (2) performing calculations correctly and checking the answer again, and (3) concluding the answer, and (c) Learners who have a low level of habits of mind tend to have less ability to solve problems. This can be shown by generally not fulfilling all indicators of mathematical problem solving ability.

Researchers also provide recommendations for further research including (1) Problem Based Learning model assisted by Wordwall Education Game can be used as an alternative solution in developing students' ability to solve problems in statistics material and (2) Students who have moderate and low levels of habits of mind can be given student worksheet both in groups and individually. It is intended that the level of habits of mind of students increases so that the mathematical problem solving ability of students is better.

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