Volume 8, Nomor 1, June 2024
Numerical: Jurnal Matematika dan Pendidikan Matematika
http://journal.iaimnumetrolampung.ac.id/index.php/numerical
DOI:https://doi.org/10.25217/numerical.v8i1.

Profile of Problem-Solving Skills Question Story based on the Polya Model at Kampus Mengajar Partner Schools

Mufadillah Mufadillah[1], Trimurtini Trimurtini[1], Teguh Supriyanto[1]

[1] Universitas Negeri Semarang, Indonesia
Correspondence: mufadillah@students.unnes.ac.id

Article Info
Article History:
Received: 16-04-2024
Revised: 15-05-2024
Accepted: 08-06-2024

Keywords:
Kampus Mengajar Partner Schools;
Polya Model;
Problem-Solving Skills;
Question Story

Abstract

The Kampus Mengajar Program is a government policy aimed at students to provide innovations to problems in partner schools in the teaching and learning process. The problem is that in learning, no attention is paid to students' problem-solving skills when working on story problems. This study aims to describe and analyze the problem-solving skills of story problems on beam volume material for grade IV students in one of the Kampus Mengajar partner schools in Pemalang Regency, SD N 3 Kedungbanjar. The qualitative approach is descriptive, involving 28 students and focusing on three students representing high, medium, and low abilities. Data collection used tests, documentation, and interviews. The instruments used were two problem-solving test questions, interview guidelines, and a rubric for assessing problem-solving skills based on the stages of the Polya Model (understanding the problem, planning a solution, implementing a solution plan, and checking back). The results showed that students with low average test scores still had difficulties in the stages of Polya's Model. Many students did not use all four stages of problem-solving entirely and correctly. Students had difficulty at the recheck stage, with the percentage of students who went through the stage only amounting to 18.75%. Based on the high, medium, and low category subjects, it shows that (1) High-skills subjects can complete all stages of Polya Model problem-solving. (2) Moderate skills subjects have not been able to complete all stages of Polya Model problem-solving by skipping the checking backstage. (3) Low-skills subjects were only able to go through the stages of making and implementing a solution plan by skipping the stages of understanding the problem and checking back. Development recommendations are expected to be needed to improve the results and process of problem-solving skills.

INTRODUCTION

Education has a significant share in life every day. The quality of Indonesian education still needs attention. The problems that occur because of COVID-19 cause learning loss. The conditions experienced are not enough for the maximum or the retreat academic. This is proven by the Global Innovation Index (GII) information. In 2020, Indonesia was ranked the third

Print ISSN: 2580-3573, Online ISSN: 2580-2437

lowest in ASEAN, with a score of 26.49. Indonesia's score dropped compared to the results of the 2019 GII, which obtained a score of 29.72. Therefore, to achieve objective national needs, a study repeats quality education in Indonesia [1].

Essential improvement of quality education to reduce learning loss influenced by the curriculum [2]. The curriculum is a central learning component that provides educational guidelines for activities. This education system in Indonesia uses an independent curriculum, as does the 2013 curriculum. Based on Circular Letter Number 0574/H.H3/SK.02.01/2023 follows up on the Decree of the Minister of Education, Culture, Research, and Technology Republic of Indonesia Number 262/M/2022 concerning Amendments to the Decree of the Minister of Education, Culture, Research, Technology 56/M/2022 concerning Guidelines Implementation Curriculum For repair learning. Each school's readiness for the independent curriculum is implemented slowly by needs and environment study.

Unit education in implementing an Independent Curriculum can become school Campus program objectives. The program is carried out by the Directorate of Learning and Student Affairs, Directorate General of Higher Education as a continuation of the existence of Independent Learning and Independent Campus (MBKM), which aims to help the learning process at school targets as partners from various village or city that entered in the 3T region (Underdeveloped, Outermost, and Innermost) [3]. This program focuses on the development skills of students who participate, with increased leadership, creativity and innovation, problem-solving problems, communication, management team, and improved analytical methods, literacy, and numeracy among student school partners.

When the Kampus Mengajar Program is implemented to increase literacy and numeracy, students assist teachers in learning in the classroom. Many are found with eye problems in mathematics, among others, students not yet fluent in counting, students who can do question stories, value low mathematics, and students who ignore the teacher when explaining. This is because problem-solving with students at Kampus Mengajar Partner Schools does not get enough attention from teachers and students, even though the problem-solving part is from eye lesson mathematics.

A solution problem means finding the unknown path and developing strategies for finding a solution. This involves a commitment to students to think, persevere, and believe self to give benefits in life every day [4]. Mechanism: To solve problems in context settlement mathematics with a developed skills to think logically, creatively, intelligently, effectively, and efficiently is understanding problem-solving mathematics [5]. Finishing problem mathematics shows results, and one must know the thinking process. One must finish more problems to get results and get used to them [6]. The National Council of Teachers of Mathematics (NCTM) states that learning allows students to a) construct knowledge of mathematics through problem-solving, b) solve problem mathematics in the context of others, c) implement and adapt problem-solving strategies problem, and d) monitor and reflect on the problem-solving process—problem mathematics [7].

Solution The problem-solving model proposed by Polya in 1957 is a most comprehensive problem from Lots the theory proposed [8]. Stages Problem-Solving Polya Model arranged

Print ISSN: 2580-3573, Online ISSN: 2580-2437

systematically and practically, making it easier for students to finish problem mathematics [9]. The first stage is to understand the problem. At this stage, students are expected to understand the problem with writing and be asked to finish the problem presented. Stage second is plan completion. At this stage, students determine the strategy that will be used to solve the problem. Stage third is carrying out plan completion. At this stage, students do procedure calculations. The fourth is to inspect the back. At this stage, this student reflects and writes a conclusion based on the results obtained [10]. Essential things in learning mathematics: To finish a problem based on the Polya Model, use appropriate stages involving attitude, experience, strategy, and skills to produce maximum objectives.

Problem-solving skills can develop through experiences that require various strategies from One problem to other problems [11]. Differences in strategies, experience, and information to students in implementing the right strategy to solve problems and reach success [12]. Differences in problem-solving strategies problem depend on the problem's types and substances [13]. Some of the usual kind of strategies used are (i) Moving to do something, (ii) Creating a picture or diagram, (iii) Tracking pattern, (iv) Creating a table, (v) Counting all possibilities in an organized way, (vi) guessing and checking; (vii) implementing a retreat strategy; (viii) identifying information given, desired, and needed; (ix) Writing notation proper mathematics; (x) Solving problem more accessible and the same; (xi) Replace view [14]. Various problem-solving strategies are used for the right choice to finish problem mathematics more effectively.

Skills to use symbols and numbers related to mathematics to finish problems daily, analyze information presented in various forms, and interpret the result. The conclusion is understanding from literacy numeracy [15]. Mathematics comes in part literacy numeracy, covering material numbers, operations and calculations, geometry and measurement, data processing, interpretation statistics, reasoning spatially, and patterns [16]. Geometry is one of the tools that are scientific and essential in the learning process of mathematics that can used For activity education field geometry and applications field science others. Material geometry given to students can make decisions, identify strategies, find concepts, and communicate the concept obtained moment learning [17]. Material geometry is one of the materials learning mathematics class IV in the even semester; the scope of his learning covers measurement area, volume, and flat shape. On the scope volume learning, it loaded objective learning cube volume, cuboid volume, object volume liquid, and combined volume. Block volume material appropriately made into measurement skills students solve problem mathematics using the Polya model. This is proven average value formative student cuboid volume material Class IV of Elementary School 3 Kedungbanjar, even semester occupy mark lowest by 80.8% compared to objective Another lesson is the volume of a cube by 82.2%, the volume of the object liquid 94.8%, and combined volume 82.5% in space volume scope.

Activity in learning mathematics: For practice, students finish the problem using question stories. Giving question stories can be associated with daily problem life for understanding draft-based mathematics [18]. The Center for Mathematics Teacher Development conducts research in many schools based in Indonesia and found that some big students experience difficulty solving problems and description problems in the form of story mathematics [19]. Questioning stories in

Print ISSN: 2580-3573, Online ISSN: 2580-2437

solving the problem is more difficult Because a big student does not understand and only reads them [20]. When reading problems, students must be careful to understand what is read. Besides that, students also need time to visualize information from what they get moment read [10].

Based on an interview with the fourth-grade teacher at SD Negeri 3 Kedungbanjar, it was found that student class IV is not yet used to doing question stories because they need lots of time to understand them. Teachers still use learning nature traditionally, so they seldom give question stories. Difficulties that are often experienced make students passive, and a less powerful reason moment determines the operation count to be used. Based on the results of the observation moment learning mathematics, use a question story. The student has silent trouble with the answer. This is because the teacher does not direct the student. For this method, the process shaped the question story by the stages of the problem-solving process.

Viewed from many students who can break down problems are in the low category. Research results previously by [21] and [22], namely problem-solving skills mathematics based on Polya Model student Good school base and middle First classified as low. Students experience difficulty finishing questions by stages polya because students are not used to doing finish-related issues with problem-solving. The study aims to describe and analyze the skills needed to process problem-solving based on the Polya Model in Kampus Mengajar Partner Schools. This is appointed directly to receive and give facilities and work together for change and practice. Good together, students. Problem-solving skills are differentiated in accordance levels; capable students high, medium, and low from answer question story cuboid volume material. Analysis results This expectation can made into classroom teacher reference in learning mathematics. Besides that, for grow problem-solving skills mathematics with give question exercise problem-solving to student.

METHODS

The type of research used is descriptive qualitative. This is due to the researcher using various natural methods to understand behavior, perception, motivation, actions, and other phenomena experienced by the subject study through the description in the text [23]. Researchers do activity Kampus Mengajar 5 Districts Pemalang at State Elementary School 3 Kedungbanjar period 20 February-9 June 2023. The research was held on 6-7 June 2023. Students in Class IV, 28 people, participated in population research. The selection technique subject was done using the purposive sampling technique, namely the election subject technique, based on specific considerations. In determining subject research, the researcher tests problem-solving skills and chooses three students as the subjects with problem-solving skills divided into high, medium, and low categories.

Data collection techniques in the study use writing tests, documentation, and interviews. Tests written using LKPD were done by all students and consisted of two questions about the volume of a cuboid. Answer students in artistry tests written and documented for problem-solving skills, with each subject capable of low, medium, and high. Then, the interview as supporting data ensures that results are tested according to analysis. The instrument study is a question test, guidelines interviews, and Rubik's evaluation skills solution. Rubik's assessment

Print ISSN: 2580-3573, Online ISSN: 2580-2437

problem-solving skills intended to obtain data based on category grouping using the Polya Model. As for Rubik's evaluation of problem-solving skills, see Table 1.

Table 1. Rubik's Assessment Skills Solution Problem [24], [25]

Stages	Evaluation	Mark
Understand problem	No written known and asked information in the answer	0
	Write information about what is known without mentioning what is being asked or on the contrary but wrong in answer	1
	Write information that is known or what is being asked not enough right and less complete in answer	2
	Write what is known and what is asked with complete and accurate answers	3
Plan settlement	There is no use for a solution strategy mathematics in working on the answer	0
	Using completion strategies but wrong on the answer	1
	Use strategy settlement mathematics with correct in-answer	2
Carry out settlement	Do not procedure settlement the same once in answer	0
	Do procedure settlement with the wrong strategy in answering	1
	Do procedure settlement with the strategy that has been planned but not enough right on the answer	2
	Do procedure settlement with the strategy that has been planned with right on the answer	3
Carry out settlement	There is no written conclusion on the answer	0
	Write a conclusion but wrong on the answer	1
	Write the conclusion with the right on the answer	2

Data analysis techniques undergo several stages: data reduction, data presentation, and extraction conclusion [26]—grading Rubik's problem-solving skills as guidelines for calculating the score for every question. The following calculation percentage for grouping category problem-solving skills is low, medium, and high use formula.

$$Persentase = \frac{Jumlah\ skor\ tahapan}{Skor\ maksimal\ tahapan} \times 100\%$$

The research was also conducted using an analysis sheet to answer students and transcripts of interviews based on each category's problem-solving skills. Then, combine them. The grouping category problem-solving skills is based on the range percentage achievement in categories high, medium, and low, as shown in Table 2.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

Table 2. Categories Skills Solution Problem [27]

Percentage Achievement	Category
75P % <100 ≤%	High
60 % <P ≤75%	Medium
0 % <P ≤60%	Low

The validity of the data generated was checked through triangulation. The triangulation technique tests data validity using a technique different from the same source. The techniques used were interviews, documentation, and tests to determine problem-solving skills. Compare the data problem-solving skills result with the data obtained from interviews and observations to produce valid and reliable data.

RESULTS AND DISCUSSION

The study was implemented in Kampus Mengajar 5 Districts Pemalang, SD N 3 Kedungbanjar school partners. Research This was implemented in one of the programs created by student Kampus Mengajar 5, Mentoring Chase. This program is conditional or not. There is a timetable bound usually done moment replace an absent teacher. Activities mentoring is used to help students study by telling stories, reading, counting, playing, and even repeating what is considered difficult learning. This program also does not differ from other programs, namely adaptation technology. Mentoring teaches students to use helpful technology like learning via LCD for viewing material in video format and even interactive questions. This makes it easier for teachers and students to learn, do assignments, and evaluate.

Research results obtained use tests, documentation, and interviews with students. Students test problem-solving skills in mathematics with work on LKPD, which consists of two-story questions regarding the block's volume on June 6, 2023. After the test, the analysis results with calculation scores were used for Rubik's evaluation of problem-solving skills to produce the highest mark, the lowest value, and the average value of students in Table 3.

Table 3. Test Results

Test Results	Mark
Number of Students	28
The highest score	95
Lowest Value	5
Average	41.25

After getting the results of the average value of the test problem-solving skills, it concluded that the problem-solving skills of cuboid volume material in class IV SD N 3 Kedungbanjar were categorized as low. The cause of the low test was that the student answering did not use the Polya Model stages. Only students whose abilities are high through all stages, from understanding

Print ISSN: 2580-3573, Online ISSN: 2580-2437

the problem, planning completion, implementation plan completion, and checking back. Students capable of medium and low only carry out several stages from the Problem-Solving Polya Model, and even those with meager problem-solving abilities in mathematics have become attention in education. This is influenced by diverse factors like lack of train question story, lack of draft mathematics, lack of interest and motivation learning, and the lack of teachers to guide students in cuboid volume material. In line with the study [28], there is a lack of teacher attention, a lack of teachers adopting question stories about problem-solving, and a lack of an approach emphasizing draft learning reasons for low problem-solving. The following percentage stages of problem-solving for students in Class IV of Elementary School 3 Kedungbanjar are based on the Polya Model in Table 4.

Table 4. Students' problem-solving abilities

No	Stages Solution Polya Model Problems	Average Percentage	Category
1.	Understand Problem	29.17%	Low
2.	Plan Completion	68.75%	Medium
3.	Carry out Plan Completion	48.80%	Low
4.	Check Back	18.75%	Low

Based on Table 4, almost all stages break the Polya Model Problem categorized low, namely at the stage understanding problem, implementing plan completion, and checking back. At the same time, the stage plan settlement is categorized as being in progress. Understanding the problem is the stage of beginning to think from the problem for the following stages. Stage understanding problems happen because there is not enough understanding to give meaning to the question story, and no one is used to writing what is known and asked in the question. Although students do not yet understand, they choose to do what is being asked directly. In line with the study [19], the subject experienced difficulty writing information and errors in the questions.

Stages plan settlement is the determined strategy for solving problems. Some students can make plans according to the chosen strategy, but some students still do not know what strategy to use in the finish problem. Research [29] obtained subjects with no written plan Because mathematics is complex and the solution is unknown. Skills in planning strategy mean that students cannot yet hook the concept obtained previously with a problem with the question [30].

Stages carry out plan settlement, a mathematical calculation from the planned strategy. The low skills at this stage are caused by errors in the calculation process that are not thorough, so the result is wrong. Students are still not fluent in counting, multiplication, and division. Factor difficulty at this stage: This student does not have enough exercise to use question stories and does not understand operation count mathematics [1].

Stages final, that is, check back with the lowest percentage compared to other stages. Students do not check repeat results and processes when writing conclusions because they believe that the answer that has been given is accurate. Research [31] showed that an error occurred when not doing inspection calculations and did not conclude at the end of the answer

Print ISSN: 2580-3573, Online ISSN: 2580-2437

to the question. Next, category problem-solving abilities were encountered from the test results for student Class IV of Elementary School 3 Kedungbanjar based on step polya in Table 5.

Table 5. Categories of Student Problem-Solving Skills

Percentage Achievement	Category	Total
75P % <100 ≤%	High	3
60 % <P ≤75%	Medium	3
0 % <P ≤ 60%	Low	22

Viewed from Table 5, based on the analysis of the results, the answer to the student Class IV of Elementary School 3 Kedungbanjar category problem-solving skills shared is high, medium, and low. Diversity level skills finish question story mathematics, including three students entering category height, three entering category medium, and 22 entering category low. Skills level students are dominated capable low. This causes difficulty for students Because there are still several errors in the question story using the Polya Model. Proven only 29.17% of students can write information known and asked in the question, then 68.75% of students plan settlement with a defined strategy, but only 40.80% can carry out plan settlement with calculations that make the correct answer, and finally at the time inspect return with write conclusion only 18.75 did it. From the results, the skills of 28 students determined that three students became subject representative research in every category of math solving. The subject details of each are in Table 6.

Table 6. Problem-solving skills of Subjects A1, A2, and A3

Stages Solution Problem Based on Polya Model							
No	Subject	Understand Problem	Plan Completion	Do Plan Completion	Check Back	Total	Percentage
1.	A1	2	2	3	2	9	90%
	A2	2	2	3	0	7	70%
	A3	0	2	3	0	5	50%
2.	A1	3	2	3	2	10	100%
	A2	2	2	3	0	7	70%
	A3	0	2	2	0	4	40%

Based on Table 6, the subject study based on test solve mathematics skills is A1 students enter in category high, A2 students enter in category medium, and A3 students enter in category low. The difference between the third subject lies in analyzing the results scoring at every stage using the Polya Model. This shows that every skilled student cannot be the same as other students [22]. The same problem faced by subjects capable of high, medium, and low lies in understanding the problem. Subject capable high and medium no mention information question in a way complete and subject capable low no mention information The same once. The result of research [32] error beginning student criteria low no written information known and asked. Stages compile and implement plan solutions on all subjects. Only subjects categorized low are

Print ISSN: 2580-3573, Online ISSN: 2580-2437

not thorough enough in calculation mathematics to produce wrong answers. Subjects with stages understand problems and planning settlement will be done using correct calculations [33]. Stages inspect return become problems on the subject capable medium and low. The subject is just capable of attractive height conclusions from results calculation. Subject no stages of inspection return were carried out because the subject is not yet capable of showing metacognitive methods with check and withdrawal conclusion [19]. The following served process analysis of solving problems from results test and interview on questions number one and two students capable low, medium, and high.

1. Solving Process Problem Question Number One

A swimming pool's size, length, width, and height are 20 m, 5 m, and 4 m respectively. Determine lots of water used for filling the pool and swimming until complete!

a. Skills Solution Problem Category Low

Skills to break down the problem category low and analyze the answer to subject A3 question number one in Figure 1.

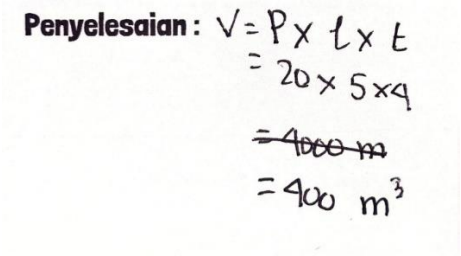

Figure 1. Answer Subject Capable Low Question One

Stages in problem-solving based on the first Polya Model understand the problem. Subject A3 does not go through stages because no written information is asked or known in the answer. In the stages of the second plan's completion, subject A3 uses a completion strategy to find the volume of a cuboid according to information on the question with proper mathematics notation. The strategy used is the election of the correct formula [12]. At this stage, the third student plans a settlement. Subject A3 calculates using the formula to find the volume of a cuboid to produce the answer right. Stages final inspection back, subject A3 does not do inspection return results answer and no write conclusion. Based on the analysis, the answer test's skills to solve problems on subject A3 is categorized as low Because it does not entirely do all Polya Model Stages. Subject A3 is only through stages of planning and implementation of plan completion. The results of the interviews conducted also support this.

D : Question number one can do? Question: Is this easy or difficult?
A3 : Yes, it is pretty good. Sis.
D : You wrote information asked and known in the answer You?
A3 : No, direct formula.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

D : How is the formula?
A3 : Length x width x height
D : Then how? find the result?
A3 : 20x5x4; the result is 400
D : You corrected return the result?
A3 : No.

b. Skills Solution Problem Medium Category

The skills to break down the problem category medium can analyze subject A2 question number one in Figure 2.

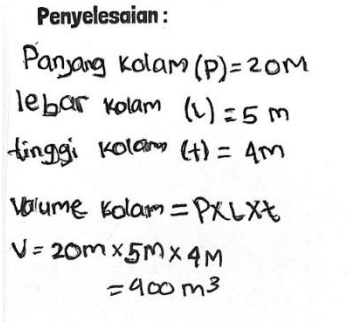

Figure 2. Answer Subject Average Skills Question One

Based on Figure 2, the results answer subject A2 at stage first understanding problem. He is already capable of writing information known but not yet complete because he had no written information asked for. Stage plan settlement subject A2 has already written down the strategy to implement with the information obtained. For write notation proper mathematics. Furthermore, the implementation plan settlement subject A2 can calculate with strategy up to get pool volume answer. Stages final inspect back, subject A2 no do prove with no give conclusion.

Subject A2, based on analysis answer obtained skills breakdown medium problem category. Completion uses Polya Model Stages that understand problems, planning completion, and plan settlement. However, to miss stages, inspect and return for withdrawal conclusion. An interview with the researcher supports this as follows.

D : Is question number 1 easy or difficult?
A2 : Easy Bro
D : Information What do you know from the question?
A2 : Length, width and height pool.
D : Why? The information asked is not written.
A2 : Yes, sis. Forget no written.
D : Then use the formula What?
A2 : Cuboid volume formula length x width x height.
D : How does it work?
A2 : Length, width, and height pool multiplied by the answer is 400.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

D : That is right, then the answer checked repeat No?
A2 : No Bro

c. Skills Solution Problem High Category

The problem-solving skills are category tall can answer analyze subject A1 questions number one in figure 3.

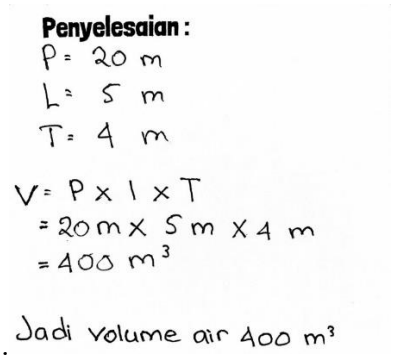

Figure 3. Answer Subject High Skills Question One

Based on Figure 3, the results analysis answer subject A1 at stage understand problem Already capable of writing information known in the answer that is length 20m, width 5m pool and height 4m pool, but the student does not write information asked. Stages furthermore that is plan settlement subject A1 already planning a resolution strategy proven with Already determine the right formula find the volume of a cuboid with writing strategy notation Mathematics. Stages implementation plan settlement subject A1 has already been carried out with the hook known information To get the pool volume answer. At this stage, inspect back. Subject A1 did the inspection return, wrote a repeat answer, and made a conclusion from the answers obtained.

Subject A1 has a problem-solving skills category. This is seen as a student capable of settlement with stages Polya complete, which is understanding the problem, planning completion, doing plan completion, and until the stages final inspection return for withdrawal conclusion. The results of the interview support this that the researcher did together with subject A1 as follows.

D : You can do question number 1?
A1 : Yes, you can, sis.
D : Try it, bro. Ask for information: What do you understand in question number 1?
A1 : Length 20 meters, width 5 meters, and height 4 meters
D : He asked what? Why not? Written?
A1 : No written Sis. He asked for the contents until they were complete.
D : Next time, it will be written Yes. Then how? How is the work done?
A1 : Wearing cuboid volume formula length x width x height
D : Then what is the solution?
A1 : 20 as long multiplied by five as comprehensive multiplied by four as a high result

Print ISSN: 2580-3573, Online ISSN: 2580-2437

is 400.

D : You checked and returned the result?

A1 : Yes, sis.

D : With method How?

A1 : Count, repeat, and write a conclusion.

2. **Solving Process Problem Number Two**

An aquarium is filled with water until it is complete with a volume of 300 cm^3. For the base, the length and width, respectively, are 10 cm and 6 cm. Then, determine the height of the aquarium!

a. Skills Solution Problem Category Low

Skills to break down the problem category low and analyze the answer to subject A3, question number two in Figure 4.

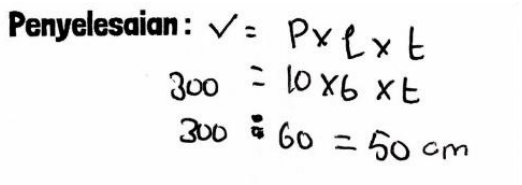

Figure 4. Answer Subject Capable Low Question Two

One of the answer subjects was categorized low based on answer question two, subject A3, at stage understand the problem. No write known and asked. The second stage of the planned settlement with subject A3 uses work strategies to back it off. This is seen from the aspect known as aquarium contents in the form of results of the volume and aspect process of the block. He asked about the usual height of the aquarium that appeared at the beginning. Stages furthermore carry out plan settlement. Subject A3 performs the calculation process using work strategies planned retreat, but The resulting answer is wrong. Stages final is inspection back. Subject A3 does not do inspection rework on work, so that answer is still wrong, and there is no written conclusion.

According to the Polya Model subject A3 on question number two, the results show that problem-solving skills are included as low. The indicators used only stages plan completion and implementation plan settlement without doing stages to understand the problem and check back. This is supported by the interview results that the researcher did with subject A3, as follows.

D : Question number 2: is it difficult or easy?

A3 : Tough

D : Why? You did not write known and asked in answer number 2.

A3 : Yes, right away. Do.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

D : How are you do?
A3 : Volume of my aquarium with length and width
D : Oh yes, the answer is, How many?
A3 : 300 divided by 60 is 50.
D : You check repeat the result?
A3 : No
D : It should be the answer is 5, checking return makes You more thorough
A3 : Okay ma'am

b. Skills Solution Problem Medium Category

The skills to break down the problem category medium can analyze subject A2 question number two in Figure 5.

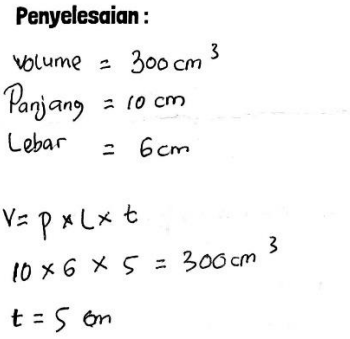

Figure 5. Answer Subject Medium Skills Question Two

Based on answer number two, subject A2 stage understands problem writing information known in the question, but no write is asked. The second stage is to plan a settlement with Subject A2 using the guess-and-check strategy. Guessing strategy This is based on knowledge that has been owned [12]. This is seen from guessing with the method of multiplying aspect long width and height, which results in a volume that has been known. Stages furthermore carry out plan settlement. Subject A2 calculates using a planned guess and check strategy to produce an answer. The indicator final is inspected back, and subject A2 does not do an inspection repeat.

The results show that problem-solving skills according to Polya Model Stages subject A2 on question number two is included in the medium. The stages used are already almost stages that understand the problem, planning resolution, and implementation plan settlement without inspecting back. The results of the interview support this that the researcher did together with subject A2 as follows.

D : Is question number 2 easy or difficult?
A2 : It is not easy, but I find the answer
D : What is known known and asked in question?
A2 : length, width, and volume of the aquarium

Print ISSN: 2580-3573, Online ISSN: 2580-2437

D : You use method What?
A2 : I count length, width, and height multiplied yields 300.
D : Then what?
A2 : The correct number is 5
D : You check repeat?
A2 : No

c. Skills Solution Problem High Category

The problem-solving skills was that the high category answer could analyze subject A1 question number two in Figure 6.

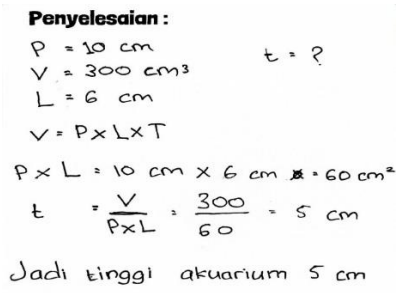

Figure 4. Answer Subject High Skills Question Two

Based on Figure 6, the analysis of the results answers subject A1 at stage understanding problem already capable of writing information known and asked with the right. Stages furthermore that is plan settlement subject A1 already planning a resolution strategy proven with Already write notation mathematics from the information presented with formula tall beam from cuboid volume formula. Stages implementation plan settlement subject A1 already carries out a calculation to produce the answer height of the aquarium. At this stage, inspect back; subject A1 did inspection return with write repeat answer with conclude the answers obtained.

A1 students have a problem-solving skills category. This is seen as a student capable of settlement with Polya Model Stages, understanding the problem, planning completion, doing plan completion, and until the stages' final inspection return for withdrawal conclusion. The results of the interview support this that the researcher did together A1 students for question number two as follows.

D : You try to mention information contained in question number two?
A1 : Length 10, width 6, volume 300, and what is being sought aquarium height.
D : You do it with the following method: What?
A1 : Wearing formula, look for a high beam.
D : Oh yeah, for that. Get the answer. How?
A1 : I calculated 300 divided by 6 times 10, resulting in 5 cm.
D : You corrected the return?
A1 : Yes

Print ISSN: 2580-3573, Online ISSN: 2580-2437

D : You conclude?
A1 : Yes ma'am

Based on Exposure results analysis, subjects capable of high, medium, and low in settlement questions number one and two use stages Polya with different processes. Subjects A1 and A2 can do stage-understand problems in questions one and two. At the same time, A3 is less capable of understanding problems. The results of the interview obtained are not used to write what is known and what is asked so that past stages understand the problem. A lack of skills to understand the problem will make students incapable of planning and implementing stages that will be used to finish the problem [25]. All subjects are already capable of completing the stage plan. Analysis results answer numbers one and two; all subjects A1, A2, and A3 determine the solution strategy. Various strategies are carried out. Use notation mathematics, work backward, and guess and check strategies. Strategy writing is an essential part. This will become an alternative solution for measuring how far they understand the problem [10]. Stages furthermore do plan settlement. Subjects A1, A2, and A3 can also do procedure calculations in planned strategy completion. Only A3 students on question number two do calculation mathematics with the wrong answer. Students who finish problems with the proper calculation process understand and pay attention to operation mathematics [33]. The final stage is to inspect the return Where subjects A1, A2, and A3 experienced difficulty. No one is used to check the return with writing conclusion. Stage This capskills shows metacognitive thinking skills inspect return after carrying out how to

CONCLUSION

Based on the analysis results, answer the problem-solving question test and story cuboid volume material for students in class IV Kampus Mengajar Partner Schools 5 Elementary Schools of Kedungbanjar 3, producing an average low skills. Causes low problem-solving skills: Students not yet used to doing question stories use Polya Model Stages with complete covering, understanding the problem, planning completion, implementation plan completion, and checking back. As for the subjects in the category, problem-solving abilities are low, high, and medium. The differences students reviewed were based on results scoring from stages of the Polya Model.

Based on the study's problem-solving skills results, the researcher recommends that other researchers develop a product or treatment for increased results and process capabilities to break down problem cuboid volume material. Mathematics teachers are expected to improve their problem-solving skills with the repair or to design activity-guided learning to increase their problem-solving skills with the question story.

REFERENCES

[1] Y. Utami and Ade Andriani, "Analysis of Students' Difficulties in Solving Mathematics Problems Based on High Order Thinking Skill (HOTS) Based on Polya Heuristic Stages

Print ISSN: 2580-3573, Online ISSN: 2580-2437

at SMP Negeri 15 Medan," *Formosa Journal of Multidisciplinary Research*, vol. 2, no. 1, pp. 191–206, 2023, doi: 10.55927/fjmr.v2i1.2348.

[2] Haffiluddin and Wahyudin, "Peningkatan Kualitas Pendidikan Melalui Kurikulum Di MTsN 1 Makassar," *Jurnal Educandum*, vol. 09, pp. 144–152, 2023.

[3] N. I. Wardhani and A. Supriyanto, "Implementasi Program Kampus Mengajar Pada Kurikulum Merdeka Belajar Kampus Merdeka Dalam Pemerataan Kualitas Pendidikan Program Studi Administrasi Pendidikan, Fakultas Ilmu Pendidikan," vol. 3, no. September, pp. 120–132, 2023.

[4] A. T. E. Pairazamán, V. H. Fernández Bedoya, W. G. I. Fretell, and V. L. E. Cárdenas, "Motivational program based on the polya method to improve the solving of mathematical problems," *International Journal of Scientific and Technology Research*, vol. 8, no. 11, pp. 626–630, 2019.

[5] R. Maharani and B. Murtiyasa, "Analysis of Students' Error in Solving Trigonometry Comparison Problems With the Polya Criteria Guiden," *Prima: Jurnal Pendidikan Matematika*, vol. 7, no. 2, pp. 157–171, 2023.

[6] K. R. Daulay and I. Ruhaimah, "Polya theory to improve problem-solving skills," *Journal of Physics: Conference Series*, vol. 1188, no. 1, 2019, doi: 10.1088/1742-6596/1188/1/012070.

[7] A. L. Son, Darhim, and S. Fatimah, "An analysis to student error of algebraic problem solving based on polya and newman theory," *Journal of Physics: Conference Series*, vol. 1315, no. 1, 2019, doi: 10.1088/1742-6596/1315/1/012069.

[8] C. I. Lee, "An appropriate prompts system based on the Polya method for mathematical problem-solving," *Eurasia Journal of Mathematics, Science and Technology Education*, vol. 13, no. 3, pp. 893–910, 2017, doi: 10.12973/eurasia.2017.00649a.

[9] L. Masi, L. Misu, and D. Pitasari, "J urnal Pendidikan Matematika," *Jurnal Pendidikan Matematika*, vol. 13, no. 2, pp. 156–166, 2022.

[10] U. Siritheeratharadol, P., Tuntivivat, S., Intarakamhang, "European Journal of Educational Research," *European Journal of Educational Research*, vol. 12, no. 2, pp. 749–758, 2023.

[11] T. Herman, "Strategi pemecahan masalah (problem solving) dalam pembelajaran matematika," *Pendidikan MAtematiak UPI*, pp. 1–12, 2020.

[12] D. Ayuningrum, "Strategi Pemecahan Masalah Matematika Siswa SMP Ditinjau Dari Tingkat Berpikir Geometri Van Hiele," *Kreano, Jurnal Matematika Kreatif-Inovatif*, vol. 8, no. 1, pp. 27–34, 2017, doi: 10.15294/kreano.v8i1.6851.

[13] S. H. Kaliky, E. Nurlaelah, and A. Jupri, "Analysis of mathematical problem solving skills students of junior high school to Polya model," *Journal of Physics: Conference Series*, vol. 1157, no. 4, pp. 8–11, 2019, doi: 10.1088/1742-6596/1157/4/042064.

[14] Wahyudi and I. Anugraheni, *Strategi Pemecahan Masalah Matematika*. Salatiga: Satya Wacana University Press, 2017.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

[15] N. Dantes and N. N. L. Handayani, "Peningkatan Literasi Sekolah Dan Literasi Numerasi Melalui Model Blanded Learning Pada Siswa Kelas V SD Kota Singaraja," *WIDYALAYA: Jurnal Ilmu Pendidikan*, vol. 1, no. 3, pp. 269–283, 2021.

[16] Kemendikbudristek, "Modul Literasi Numerasi Di Sekolah Dasar," *Modul Literasi Numerasi Di Sekolah Dasar*, vol. 1, p. 22, 2021.

[17] R. M. M. Sari, N. Priatna, and D. Juandi, "Analysis of High School Students Logical-Mathematical Thinking Skills Based on the Polya Stage Solving in Terms of Mathematical Self-Concept Skills," *Prima: Jurnal Pendidikan Matematika*, vol. 6, no. 1, p. 53, 2022, doi: 10.31000/prima.v6i1.5316.

[18] G. Utami, B. A. Saputro, M. Fita, and A. Untari, "Error Analysis In Solving FPB And KPK Story Questions Based On Polya Procedures For Fourth Grade Elementary School Students," *International Journal of Elementary Education*, vol. 4, no. 4, pp. 642–654, 2020.

[19] W. Arsyabinta, "Analisis Kesulitan Pemecahan Masalah Matematika Berdasarkan Teori Polya," no. 499, pp. 1–6, 2023.

[20] K. Putrieny and R. Setiani, "Newman Error Analysis (Nea) Dalam Pemecahan Masalah Berdasarkan Teori Polya Soal Cerita Bertipe Hots Materi Volume Balok Siswa Kelas V Sdn 2 Tanggulwelahan," *Jurnal Pendidikan DEWANTARA: Media Komunikasi, Kreasi dan Inovasi Ilmiah Pendidikan*, vol. 9, no. 2, pp. 63–71, 2023, doi: 10.55933/jpd.v9i2.512.

[21] E. N. Christina and A. G. Adirakasiwi, "Analisis Kemampuan Pemecahan Masalah Tahapan Polya Dalam Menyelesaikan Persamaan Dan Pertidaksamaan Linear Satu Variabel," *JPMI: Jurnal Pembelajaran Matematika Inovatif*, vol. 4, no. 2, pp. 405–424, 2021, doi: 10.22460/jpmi.v4i2.405-424.

[22] Daffa Tasya Pratiwi and Fitri Alyani, "Kemampuan Pemecahan Masalah Matematika Siswa Kelas V SD Pada Materi Pecahan," *Journal for Lesson and Learning Studies*, vol. 5, no. 1, pp. 136–142, 2022, doi: 10.23887/jlls.v5i1.49100.

[23] L. J. Moleong, *Metode Penelitian Kualitatif*, Cetakan ke. Bandung: PT Rosdakarya Offset, 2017.

[24] N. H. Sari, S. Sutiarso, and S. Dahlan, "Analysis of students problem solving skills by using polya steps in linear program material," *International Conference on Mathematics and Science Education*, vol. 4, pp. 39–44, 2019.

[25] K. Mawardi, A. Arjudin, M. Turmuzi, and S. Azmi, "Analisis Kemampuan Pemecahan Masalah Matematika pada Siswa SMP dalam Menyelesaikan Soal Cerita Ditinjau dari Tahapan Polya," *Griya Journal of Mathematics Education and Application*, vol. 2, no. 4, pp. 1031–1048, 2022, doi: 10.29303/griya.v2i4.260.

[26] Sugiyono, *Metode Penelitian Kuantitatif Kualitatif dan R&D*. Bandung: Alfabeta, 2019.

[27] H. Hermawati, J. Jumroh, and E. F. P. Sari, "Analisis Kemampuan Pemecahan Masalah Matematis pada Materi Kubus dan Balok di SMP," *Mosharafa: Jurnal Pendidikan Matematika*, vol. 10, no. 1, pp. 141–152, 2021, doi: 10.31980/mosharafa.v10i1.874.

[28] T. Mulyati, "Kemampuan Pemecahan Masalah Matematis Siswa Sekolah Dasar (Mathematical Problem Solving Skills of Elementary School Students)," *EDUHUMANIORA: Jurnal Pendidikan Dasar*, vol. 3, no. 2, pp. 1–20, 2016.

Print ISSN: 2580-3573, Online ISSN: 2580-2437

[29] D. P. Lestari, A. Y. Soegeng Ysh, and J. Sulianto, "Analisis Kesulitan Belajar Siswa Dalam Memecahkan Masalah Matematika Dengan Metode Polya Pada Materi Pecahan Kelas V Sd Negeri 1 Doplang," *Didaktik : Jurnal Ilmiah PGSD STKIP Subang*, vol. 9, no. 1, pp. 656–669, 2023, doi: 10.36989/didaktik.v9i1.726.

[30] P. A. Udil, F. M. Y. Kase, and P. P. Senid, "Proses Pemecahan Masalah Matematika Siswa SD Berdasarkan Langkah Pemecahan Masalah Polya Pada Materi Bangun Datar," *Seminar Nasional Pendidikan Matematika Universitas Pattimura*, vol. 2, no. 2006, pp. 78–89, 2021.

[31] H. W. D. Satuti, K. Fajriyah, and A. T. Damayani, "Analisis Kemampuan Pemecahan Masalah Matematika Siswa Berdasarkan Tahapan Polya dalam Menyelesaikan Soal Cerita Bangun Datar Kelas IV SD Negeri 2 Sumberagung," *Wawasan Pendidikan*, vol. 3, no. 2, pp. 595–608, 2023, doi: 10.26877/wp.v3i2.12299.

[32] A. N. Fadilah, "Analisis kemampuan pemecahan masalah matematis siswa kelas ix pada materi spldv berdasarkan tahapan polya," vol. 5, no. 4, pp. 1049–1060, 2022, doi: 10.22460/jpmi.v5i4.1049-1060.

[33] A. C. Ully and D. L. Hakim, "Jurnal Didactical Mathematics Kemampuan Pemecahan aMasalah Matematis Siswa dengan Tahapan Polya," vol. 4, no. April, pp. 156–162, 2022.

Print ISSN: 2580-3573, Online ISSN: 2580-2437