Absis: Mathematics Education Journal
Vol. 8., No. 1, May 2026, pp. 44-53
ISSN 2686-0104 (print), 2686-0090 (online)
http://journal.univetbantara.ac.id/index.php/absis/index

Problem-Solving Ability In Arithmetic Sequences And Series Using Problem-Based Learning

Mariana Marta Towe[a,1*]

[a] Institut Keguruan dan Teknologi Larantuka, East Flores Regency, East Nusa Tenggara, Indonesia
[1] diparhyana@gmail.com
* Corresponding Author

Received 30 April 2026; accepted 22 May 2026; published 23 May 2026

ABSTRACT

This study aims to describe the learning process on the topic of sequences and series using the Problem-Based Learning (PBL) approach, and to describe students' mathematical problem-solving abilities on the topic of arithmetic sequences and series using the Problem-Based Learning (PBL) approach. The study was conducted at SMA Negeri 1 Adonara Tengah in February 2026. The subjects of this study were 16 students in Grade XI. The data collection techniques used were learning process, written tests, and interviews. Mathematics learning on the topic of sequences and series using the PBL approach was carried out through several stages: (a) orientation, (b) organizing, (c) guiding individual/group investigation, (d) developing and presenting, and (e) analyzing and evaluating. The results of the written test from 16 students, analyzed based on indicators of mathematical problem-solving ability, showed that for Problem 1, all 16 students (100%) were classified as having high problem-solving ability, having met indicators 1–4; for Problem 2, 13 students (81.25%) were classified as having high problem-solving ability, having met indicators 1–4, while 3 students (18.75%) were classified as having moderate problem-solving ability, having only met indicators 1–2. Based on the results obtained, it can be concluded that mathematics learning on the topic of sequences and series using the PBL approach can improve students' problem-solving abilities.

KEYWORDS

Problem Solving
Arithmetic Sequences
Arithmetic Series
Problem-Based Learning

1. Introduction

Mathematics learning is not merely a process of calculation, but rather a means of thinking critically and creatively in solving everyday problems. According to Hamza (Saravina, 2024), mathematics learning is a process deliberately designed to create a learning environment that involves teachers and the active participation of students in order to achieve learning objectives and sharpen their problem-solving abilities. Furthermore, Panggabean in Dwi Safirah & Irfan Abdillah, (2024)explains that mathematics learning can improve problem-solving skills if students have the opportunity to solve problems using their own strategies and to see how those problems are solved. In line with this, (Syafitri et al., 2025) and (*Gozali et al., 2022)*, reveal that problem-solving is the first step for students to develop ideas in building new knowledge and developing mathematical skills.

In solving problems, students draw on information from concepts they already know, then connect them with other concepts and process them to find the right strategy for solving the problem at hand (Sari et al., 2021). The steps in problem-solving include understanding the problem, designing a solution strategy, implementing the plan, and re-evaluating the solution obtained (Lubis A.F et al., 2023). Therefore, students need to recognize and understand the problem and be able to determine the appropriate strategies and steps for its resolution. In today's global era, mathematical problem-solving is important for facing complex challenges in everyday life (Siswanto et al., 2025; Subekti & Jazuli, 2020).

Although problem-solving ability is very important in mathematics learning, in reality, this ability has not yet been mastered by students. Yuda & Rosmilawati, (2024) state that the low level of students' mathematical problem- solving ability in Indonesia is evidenced by the results of PISA (Programme for International Student Assessment) in 2023, in which Indonesia ranked 67th out of 81 countries

worldwide with a score of 366, below the mean score of 472 set by PISA. This indicates that there is still a great need for improvement in the field of mathematics learning.

One mathematics topic that demands problem-solving ability is sequences and series. Arithmetic sequences and series play an important role in everyday life, such as in calculating savings, arranging schedules, designing buildings, managing finances, and setting business targets, as all of these involve regular patterns of increase or decrease. Based on interviews with one of the mathematics teachers at SMA Negeri 1 Adonara Tengah, it was stated that the low problem-solving ability of students on the topic of sequences and series is due to students' inability to understand the context of problems and their confusion in translating word problems into mathematical models, so that students are often unable to select the appropriate formula to solve the given problems. This is reinforced by students' test results on the topic, where out of 23 students, only 8 achieved the minimum passing score (KKM). It was further explained that learning had only focused on the content of sequences and series without touching on the application of the material to everyday problems. Therefore, a learning model that emphasizes real-world problems and encourages active student engagement is needed. Selecting the right learning model is crucial in order for learning objectives to be achieved.

Holo & Towe (2023) and Puja et al. (2023) argue that Problem-Based Learning is a learning model that presents real-world problems engaging students to think critically, to learn to understand what is presented, and to analyze the problems displayed in order to find solutions on their own. Furthermore, Husna in (Fore Besin et al., 2025) states that Problem-Based Learning is a learning solution that emphasizes active student involvement through the presentation of contextual problems, enabling students to think critically, engage in discussion, explore information, and discover solutions independently.

Problem Based Learning has several benefits when implemented in learning, including: (1) fostering independent learning through the use of technology and books; (2) students are more active in learning while the teacher serves only as a facilitator; (3) learning is presented based on problems drawn from real life, making it meaningful for students' future lives; and (4) learning activities are carried out in groups, giving rise to peer tutoring and creating communication through discussion — (Prastitasari et al., 2025) and Jatisunda & Nahdi, (2020). According to (Koten et al., 2022), the syntax of the Problem-Based Learning model goes through several phases, namely orienting students to the problem, organizing students for learning, guiding individual or group investigation, developing and presenting work, and analyzing and evaluating the work produced.

Several studies have demonstrated the effectiveness of PBL in improving students' mathematical problem-solving abilities, as shown by Ardani, (2024) in a study on the topic of three-dimensional shapes. Research by Wulandari, (2022) on the topic of circles found an improvement in problem-solving ability from Cycle I to Cycle II of 19.51%. Furthermore, (Kania et al., 2020) in her research showed that the application of problem-based learning with GeoGebra can improve the mathematical problem-solving ability of students in Class IX-H at SMP Negeri 1 Paseh Sumedang.

Nevertheless, most studies conducted using problem-based learning on the topic of sequences and series have focused solely on the content itself without addressing the application of the material to everyday problems. Therefore, this study incorporates the use of the material in various forms of problems and exercises given to students to solve during both the learning process and the written test.

2. Method

In this study, the type of research used is qualitative research, with the aim of describing the learning process on the topic of sequences and series using the Problem-Based Learning (PBL) approach, and of describing students' mathematical problem-solving abilities on the topic of arithmetic sequences and series using the Problem-Based Learning (PBL) approach. The study was conducted at SMA Negeri 1 Adonara Tengah in February 2026. The subjects of this study were 16 students in Grade XI. The data collection techniques used were observation of the learning process, written tests, and interviews. The written test was administered to students with the aim of determining their problem-solving abilities after undergoing the learning process using the PBL approach, in accordance with the indicators or steps of problem-solving, namely understanding the problem, designing a solution strategy, implementing the

solution plan, and evaluating the solution obtained. The written test results were categorized based on students' answers, whereby answers of a similar type were grouped into high, moderate, and low categories (Wijaya et al., 2025). Based on these categories, one student was randomly selected for an interview. In the interviews, the researcher employed a semi-structured interview format, in which the researcher prepared a general interview guide containing the indicators of problem-solving ability, with questions that could be developed according to the researcher's needs. The data were then collected and analyzed using the data analysis technique proposed by Miles and Huberman, consisting of data reduction, data presentation, and conclusion verification. The validity of the data was tested using data triangulation and source triangulation, namely by cross-checking data from the same source (Syamsuddin et al., 2023).

3. Results and Discussion

3.1. Result

Based on the research that has been conducted, the following results were obtained: (1) the learning steps on the topic of sequences and series using the PBL approach were found to be effective, consisting of (a) orientation, (b) organizing, (c) guiding individual/group investigation, (d) developing and presenting, and (e) analyzing and evaluating; (2) based on the indicators of mathematical problem-solving ability, the results showed that for Problem 1, all 16 students (100%) were classified as having high problem-solving ability, having met indicators 1–4; for Problem 2, 13 students (81.25%) were classified as having high problem-solving ability, having met indicators 1–4, while 3 students (18.75%) were classified as having moderate problem-solving ability, having only met indicators 1–2. Based on the results obtained, it can be concluded that mathematics learning on the topic of sequences and series using the PBL approach can improve students' problem-solving abilities.

3.2. Discussion

This research began with the implementation of the learning process on the topic of sequences and series using the PBL approach. The learning objective was for students to be able to solve mathematical problems on the topic of arithmetic sequences and series. The steps of learning using the PBL approach are as follows:

3.2.1. Orienting Students to the Problem.

At this stage, the learning objectives were communicated to the students, discussion groups were formed, and two problems were given to the students to solve. The problems presented were as follows.

1. *In a meeting hall, there are 20 rows of chairs with 20 chairs available in the front row. Each subsequent row has 3 more chairs than the row in front of it. Calculate the number of chairs in the 8th row!*
2. *Andi saves Rp. 10,000 in the first month and Rp. 25,000 in the second month, and continues to increase his savings by Rp. 15,000 each month thereafter. What is the total amount of Andi's savings after one year?*

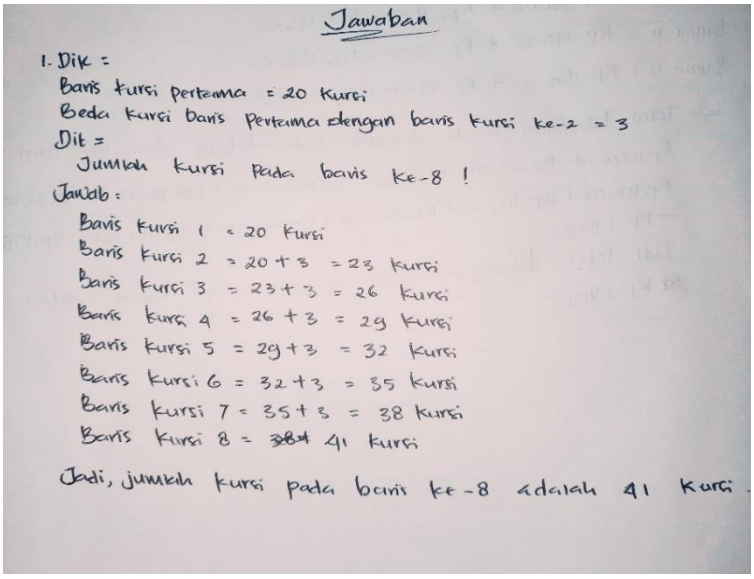
3.2.2. The teacher guides students in formulating the problem.

The teacher asks students to observe, read, understand, and analyze the problem in groups, and to raise any points they do not yet understand regarding the problem presented. The teacher also asks students to solve the worksheet problems in their own way; if there are aspects that students do not yet understand, the teacher provides scaffolding in the form of guiding sentences to direct students toward the problem.

3.2.3. The teacher guides students in gathering relevant information.

At this stage, students solve the worksheet problems in groups. The teacher acts as a facilitator by guiding and supporting students so that they can learn independently within their groups. For problem 1, students were asked to solve an arithmetic sequence problem. In the worksheet, the group had understood the given problem well and solved it correctly, so the researcher did not provide any scaffolding. The students' work results were as follows.

ISSN 2686-0104 (print), 2686-0090 (online)
Absis: Mathematics Education Journal
Vol. 8., No. 1, May 2026, pp. 44-53


Jawaban

1. Dik :
Baris kursi pertama = 20 kursi
Beda kursi baris pertama dengan baris kursi ke-2 = 3
Dit :
Jumlah kursi pada baris ke-8 !
Jawab :
Baris kursi 1 = 20 kursi
Baris kursi 2 = 20 + 3 = 23 kursi
Baris kursi 3 = 23 + 3 = 26 kursi
Baris kursi 4 = 26 + 3 = 29 kursi
Baris kursi 5 = 29 + 3 = 32 kursi
Baris kursi 6 = 32 + 3 = 35 kursi
Baris kursi 7 = 35 + 3 = 38 kursi
Baris kursi 8 = ~~38+~~ 41 kursi

Jadi, jumlah kursi pada baris ke-8 adalah 41 kursi.

Fig 1. Students' Work Results on Problem 1

Based on the students' work results, it can be concluded that the students were able to understand the problem by writing down the known information, namely that the first row has 20 chairs, the common difference between the first and second rows is 3 chairs, and the question asks for the number of chairs in the 8th row. The students devised a solution strategy using their understanding of arithmetic sequences by adding 3 to each successive row, from the second row up to the eighth row, and subsequently the students drew a final conclusion.

Based on the students' work results in Figure 1, the following conclusions can be drawn: (1) Students were able to understand the problem; (2) Students were able to devise a solution plan; (3) Students were able to solve the problem in accordance with their plan; (4) Students were able to review their work and draw a conclusion from their results.

For problem 2, students were asked to solve an arithmetic series problem. In the worksheet, the students had understood the given problem well and solved it correctly, so the researcher did not provide any scaffolding. The students' work results were as follows.

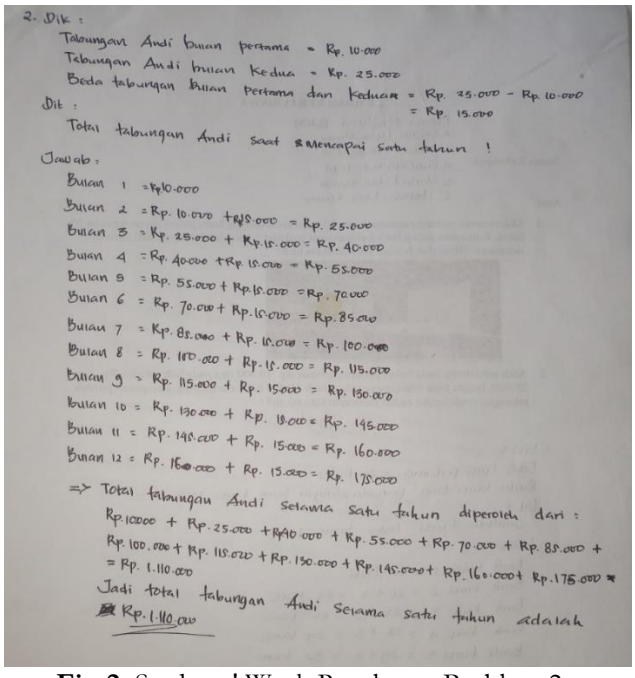

2. Dik :
Tabungan Andi bulan pertama = Rp. 10.000
Tabungan Andi bulan kedua = Rp. 25.000
Beda tabungan bulan pertama dan kedua = Rp. 25.000 - Rp. 10.000
= Rp. 15.000
Dit :
Total tabungan Andi saat mencapai satu tahun !
Jawab :
Bulan 1 = Rp10.000
Bulan 2 = Rp. 10.000 + Rp15.000 = Rp. 25.000
Bulan 3 = Rp. 25.000 + Rp.15.000 = Rp. 40.000
Bulan 4 = Rp. 40.000 + Rp. 15.000 = Rp. 55.000
Bulan 5 = Rp. 55.000 + Rp.15.000 = Rp. 70.000
Bulan 6 = Rp. 70.000 + Rp.15.000 = Rp. 85.000
Bulan 7 = Rp. 85.000 + Rp. 15.000 = Rp. 100.000
Bulan 8 = Rp. 100.000 + Rp. 15.000 = Rp. 115.000
Bulan 9 = Rp. 115.000 + Rp. 15.000 = Rp. 130.000
Bulan 10 = Rp. 130.000 + Rp. 15.000 = Rp. 145.000
Bulan 11 = Rp. 145.000 + Rp. 15.000 = Rp. 160.000
Bulan 12 = Rp. 160.000 + Rp. 15.000 = Rp. 175.000
=> Total tabungan Andi selama satu tahun diperoleh dari :
Rp.10000 + Rp. 25.000 + Rp40.000 + Rp. 55.000 + Rp. 70.000 + Rp. 85.000 +
Rp. 100.000 + Rp. 115.000 + Rp. 130.000 + Rp. 145.0000 + Rp. 160.000 + Rp. 175.000 =
= Rp. 1.110.000
Jadi total tabungan Andi selama satu tahun adalah
Rp. 1.110.000

Fig 2. Students' Work Results on Problem 2

Based on the students' work results, it can be concluded that the students were able to understand the problem by writing down the known information, namely Andi's savings in the first and second months, as well as calculating the common difference. The students also wrote down what was being asked in the problem, namely the total amount of Andi's savings over one year. To solve the problem, the students then devised a solution strategy using their understanding of arithmetic series by summing the initial savings value and adding the common difference for each subsequent month. The students also drew a conclusion from their solution by writing that the total amount of Andi's savings over one year is Rp 1.110.000.

Based on the students' work results in Figure 2, the following conclusions can be drawn: (1) Students were able to understand the problem; (2) Students were able to devise a solution plan; (3) Students were able to solve the problem in accordance with their plan; (4) Students were able to review their work and draw a conclusion from their results.

3.2.4. Developing and Presenting Work Results.

At this stage, the teacher asked students to write up the results of their group discussion neatly, in detail, and systematically. The teacher then asked students to present their group's results in front of the class and gave other groups the opportunity to respond.

3.2.5. Analyzing and Evaluating the Problem-Solving Process.

At the final stage, the teacher and students together drew conclusions on the material of arithmetic sequences and series. The teacher then provided reinforcement and motivation to the students regarding the material that had been taught.

After the learning process was completed, the researcher administered a written test to measure students' comprehension abilities. Students were given 3 problems to solve, as follows.

1. *A fruit vendor arranges apples in a tiered formation. In the first row there are 5 apples, in A fruit vendor arranges apples in a tiered formation. In the first row there are 5 apples, in the second row there are 8 apples, and so on. How many apples are there in the 15th row?*
2. *A runner increases his training distance every day. On the first day, he runs 3 km. Each day, he adds 0.5 km to his distance. What is the total distance he covers over 12 days of training?*

The 16 Class XI students of SMA Negeri 1 Adonara Tengah who participated in the written test, the researcher analyzed the students' work results based on Polya's problem-solving indicators, namely: 1) understanding the problem: students are able to write or state the information obtained from the given question; 2) devising a plan: students design a solution by constructing a mathematical model and determining an appropriate strategy to solve the given problem; 3) carrying out the plan: students are able to solve the problem using their chosen strategy with accurate results; 4) looking back: students are able to verify the accuracy of the results or answers. The results of the students' written test are as follows:

3.2.1. Students' Work Results on Problem 1

For problem 1, all students answered in the same manner. The students' work results are as follows:

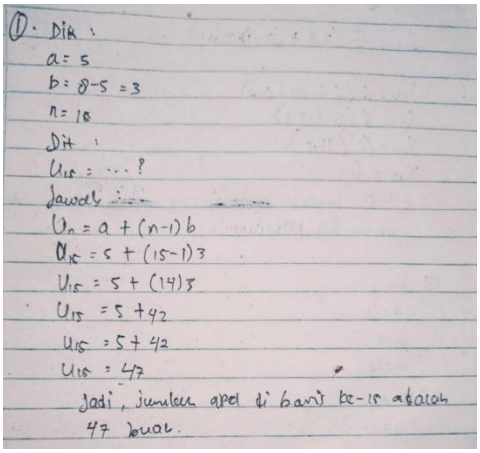


Fig 3. Students' Work Results on Problem 1

Based on the work results above, the students were able to understand the problem. The students first wrote *down* the information contained in the problem, namely the known values: the first term and the common difference between terms. The students also wrote down what was being asked in the problem, namely the number of apples in the 15th row. The students then devised a solution plan using the arithmetic sequence formula, and subsequently reviewed their answers and drew a conclusion that the number of apples in the 15th row is 47 apples.

Based on the students' work results in Figure 3, the following conclusions can be drawn: (1) Students were able to understand the problem; (2) Students were able to devise a solution plan; (3) Students were able to solve the problem in accordance with their plan; (4) Students were able to review their work and draw a conclusion from their results.

3.2.2. Students' Work Results on Problem 2.

- There were 13 out of 16 students who answered in this manner. The students' work results are as follows.

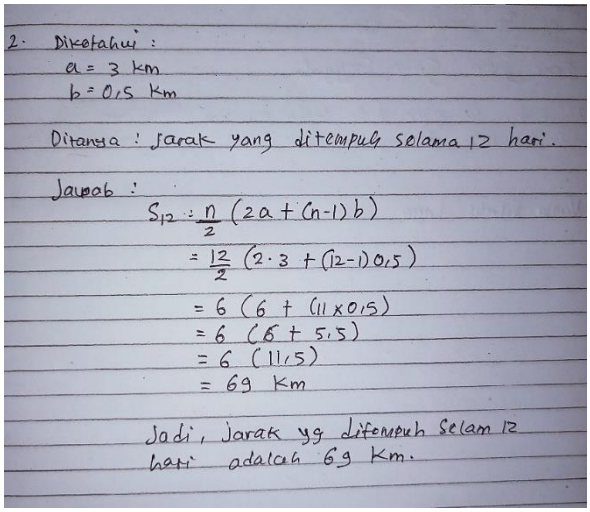


Fig 4. Student 1's Work Results on Problem 2

Based on the work results above, the steps used were already correct. The students wrote down the information contained in the problem, namely the known values: the first term and the common difference between terms. The students also wrote down what was being asked in the problem, namely the total distance covered over 12 days of training. The students then devised a solution plan using the arithmetic series formula and solved the problem. The students reviewed their answers and drew a conclusion by writing that the total distance covered over 12 days is 69 km.

Based on the students' work results in Figure 4, the following conclusions can be drawn: (1) Students were able to understand the problem; (2) Students were able to devise a solution plan; (3) Students were able to solve the problem in accordance with their plan; (4) Students were able to review their work.

- Student 2's Answer

  There were 3 out of 16 students who answered in this manner. Based on the work results in Figure 4, the students wrote down the information contained in the problem, namely the known values: the first term by writing the letter a = 3 and the common difference by writing the letter b = 0.5. The students also wrote down what was being asked in the problem, namely the total distance covered over 12 days of training. The students then devised a solution plan using the arithmetic series formula. The students had applied the formula correctly; however, the steps in carrying out the operations were not yet accurate. The students' error lay in their decision-making when performing addition and multiplication operations. The students added 6 and 11 and then multiplied the result by 0.5. This incorrect problem-solving process consequently led to an inaccurate final answer. The students' answers are as follows:

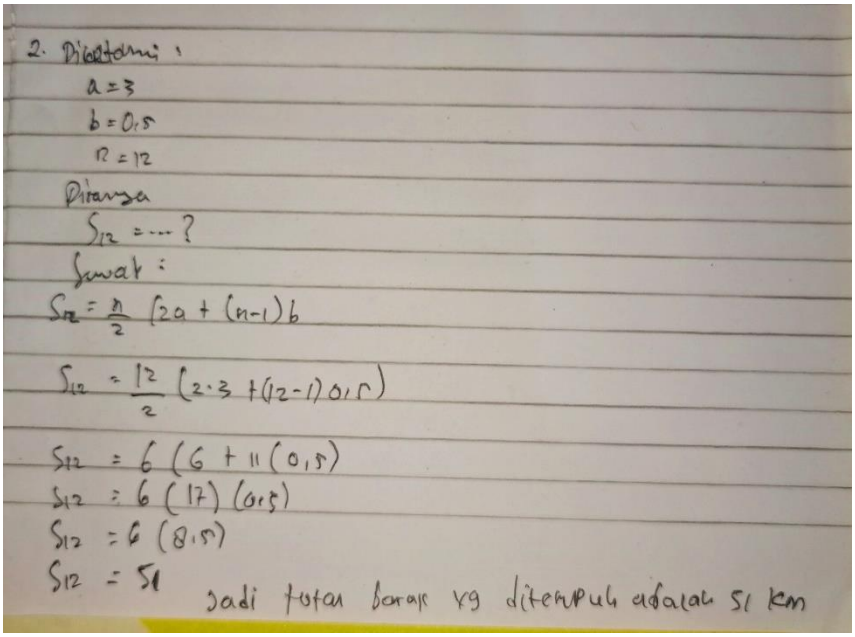


Fig 4. Student 2's Work Results on Problem 2

The teacher then conducted a student interview to confirm the problem-solving process carried out by the student.

Teacher: "Please look at your solution again."
Student: "Yes, ma'am."
Teacher: "In your opinion, are the operations already correct?"
Student: "Yes, ma'am."
Teacher: "In mathematical operations, you need to pay attention to the operation signs. Please look again at the calculation process you have written. Is there any error in the arithmetic operations?"
Student: (confused)
Teacher: "Okay. Now please explain how you carried out the arithmetic operations to arrive at the result."
Student: "First, I wrote the formula $S_n = \frac{n}{2}(2a + (n-1)b)$ *and then I substituted the known values into the formula like this miss,* $S_{12} = \frac{12}{2}(2 \times 3 + (12-1)0{,}5)$ *."*
Teacher: "Then, which operation did you solve first?"
Student: "We divided first $\frac{12}{2} = 6$*. After that* $6(6 + (11)0{,}5)$*, we added 6 + 11 = 17, then we multiplied* $17 \times 0{,}5 = 8{,}5$*, and then we multiplied again by 6 as the result* $\frac{n}{2}$*, so we got 51."*
Teacher: "Are the operation steps already correct?"
Student: (confused)
Teacher: "Let me give you an example. For instance $2 + (2 \times 3)$*, given an expression like that, what would you solve first?"*
Student: "What is inside the brackets first, ma'am $(2 \times 3) = 6$*, and after that we operate from left to right* $2 + 6 = 8$*."*
Teacher: "So, in solving problem number two earlier, did you not make an error?"
Student: "I'm sorry, ma'am, there was an error in that part $6(6 + (11)0{,}5)$*. We directly added the values* $6 + 11$ *and got 17, then multiplied it by 0.5, ma'am."*
Teacher: "Yes, that is where your error lies. You should have first performed the multiplication $11 \times 0{,}5$*, and after that added the result to the 6 inside the brackets. Finally, you multiply by the 6 outside the brackets at the front."*

Student: "Understood, ma'am."
Teacher: "So, next time before performing operations on a number, you must first pay attention to the operation signs present in the expression."
Student: "Yes, ma'am."

Based on the students' work, interview results, and the indicators of problem-solving ability, the following conclusions can be drawn: (1) students were able to understand the problem by writing down what was known and what was being asked; (2) students were able to devise a solution plan by correctly writing the arithmetic series formula and accurately substituting the values into the formula; (3) based on the students' work, it was observed that they made errors in the process of multiplication and addition operations, resulting in incorrect final answers; (4) students drew conclusions that were not yet accurate.

4. Conclusion

Based on the analysis and research results obtained, it can be concluded that mathematics learning on the topic of sequences and series using the PBL approach can improve students' problem-solving abilities through the following stages: (a) orientation, (b) organizing, (c) guiding individual/group investigation, (d) developing and presenting, and (e) analyzing and evaluating. This is reinforced by the written test results analyzed based on the indicators of mathematical problem-solving ability, namely understanding the problem, designing a solution strategy, and implementing the solution plan, which showed that for Problem 1, all 16 students (100%) were classified as having high problem-solving ability, having met indicators 1–4 of problem-solving; for Problem 2, 13 students (81.25%) were classified as having high problem-solving ability, having met indicators 1–4, while 3 students (18.75%) were classified as having moderate problem-solving ability, having only met indicators 1–2. Based on the results obtained, it can be concluded that mathematics learning on the topic of sequences and series using the PBL approach can improve students' problem-solving abilities.

This is in line with the research conducted by (Ili & Jusmaningsih, 2022), which states that the application of the problem-based learning model in online learning using the Zoom application can accommodate learning activities in the same way as face-to-face classroom learning. The number of students in each category of mathematical problem-solving ability was as follows: 17.64%, or 3 students, were in the high category; 29.41%, or 5 students, were in the moderate category; and 52.94%, or 9 students, were in the low category. In addition, research conducted by Panjaitan, (2023) on students' mathematical problem-solving ability using the problem-based learning model showed that 11 students had very good ability (28.94%), 8 students had good ability (21.05%), and 19 students had poor ability (50%).

References

Ardani, D. A. P. (2024). Peningkatan Kemampuan Pemecahan Masalah Matematika Melalui Pembelajaran Berbasis Masalah di Kelas 7F SMPN 1 Tarik. *Postulat : Jurnal Inovasi Pendidikan Matematika*, *4*(2), 248. https://doi.org/10.30587/postulat.v4i2.7081

Dwi Safirah Adita, & Irfan Abdillah, M. (2024). Pengaruh Model Problem Based Learning Terhadap Kemampuan Pemecahan Masalah Matematika Siswa SD. In *Jurnal Penelitian Pendidikan* (Vol. 1, Number 2). https://journal.unwira.ac.id/index.php/ARSEN

Fore Besin, Y., Ovaritus Jagom, Y., Didimus Nai, Y., Widya, K., & Kupang, M. (2025). Hubungan Persepsi Siswa Terhadap Model Problem Based Learning (PBL) Dengan Kemampuan Pemecahan Masalah Matematika Di Sma Pada Materi SPLDV. In *ELIPS: JURNAL PENDIDIKAN MATEMATIKA* (Vol. 6, Number 2). http://journal.unpacti.ac.id/index.php/ELIPS

Gozali, I., Nindiasari, H., & Fatah, A. (2022). *Pengaruh Pembelajaran Berbasis Masalah terhadap Disposisi Matematis dan Kemampuan Pemecahan Masalah Siswa*. https://doi.org/DOI:https://doi.org/10.22437/edumatica.v12i02.15772

Holo, O. P., & Towe, M. M. (2023). Pengembangan Permainan Matematika Berbasis Problem Based Learning (Pbl) Pada Materi Barisan Dan Deret. In *Jurnal Kependidikan Matematika* (Vol. 15, Number 1). https://doi.org/DOI:https://doi.org/10.30822/asimtot.v5i01.2821

Ili, L., & Jusmaningsih, D. (2022). Analisis kemampuan pemecahan masalah matematika melalui pembelajaran daring menggunakan model pembelajaran berbasis masalah. *Jurnal Konseling Dan Pendidikan*, *10*(1), 112. https://doi.org/10.29210/169100

Intan Sari, N., Azmi, S., & Sarjana, K. (2021). Analisis Tingkat Metakognisi Peserta Didik dalam Memecahkan Masalah Matematika. In *Griya Journal of Mathematics Education and Application* (Vol. 1, Number 1). https://mathjournal.unram.ac.id/index.php/Griya/index

Jatisunda, M. G., & Nahdi, D. S. (2020). Kemampuan Pemecahan Masalah Matematis melalui Pembelajaran Berbasis Masalah dengan Scaffolding. *Jurnal Elemen*, *6*(2), 228–243. https://doi.org/10.29408/jel.v6i2.2042

Kania, Poppy Yaniawati, Rully Indrawan, & Eka Firmansyah. (2020). Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa Melalui Pendekatan Pembelajaran Berbasis Masalah Dengan Geogebra. *Pasundan Journal of Mathematics Education (PJME)*. https://doi.org/DOI10.5035/pjme.v10i2.3151

Koten, A. K., Towe, M. M., Muaraya, I. P., Keguruan, I., & Larantuka, T. (2022). Analysis Of Problem Solving Ability In Straight Line Equations Using Problem Based Learning. In *Jurnal Kependidikan Matematika* (Vol. 31, Number 1). https://doi.org/https://journal.unwira.ac.id/index.php/ASIMTOT.

Lubis A.F, F., Azizah, N., Ardiani, V., Latifah Zahari, C., Matematika, P., & Muslim Nusantara Al Washliyah Medan, U. (2023). Analisis Kemampuan Pemecahan Masalah Matematis pada Materi Sistem Persamaan Linier Dua Variabel (SPLDV) Ditinjau dari Self Directed Learning. *Jurnal Dirosah Islamiyah*, *5*, 411. https://doi.org/10.17467/jdi.v5i2.2974

Panjaitan Hendrikson R. (2023). Analisis Kemampuan Pemecahan Masalah dan Kemampuan Berpikir Kreatif Matematika Siswa Melalui Penerapan Model Pembelajaran Berbasis Masalah pada Siswa Kelas VIII SMP Jendral Sudirman Medan. *Jurnal Pengabdian Masyarakat Dan Riset Pendidikan*, *1*(3), 167–170. https://doi.org/10.31004/jerkin.v1i3.42

Prastitasari, H., Ali, I. H., Jannah, F., & Prihandoko, Y. (2025). Pembelajaran Berbasis Masalah Dalam Pembelajaran Matematika Di Sekolah Dasar. In *JoJurnal of Creativity and Innovation on Elementary School (JCIES)* (Vol. 01, Number 01). https://doi.org/https://ppjp.ulm.ac.id/journal/index.php/jcies/article/view/22730/0

Puja, O. :, Ningrum, W., Nuraeni, F., & Caturiasari, J. (2023). *Pengaruh Penerapan Model Problem Based Learning (PBL) Terhadap Kemampuan Pemecahan Masalah Siswa Sekolah Dasar Pada Pembelajaran Matematika*. https://doi.org/10.53515/qodiri

Saravina, F. M. P. Z. H. F. B. E. S. (2024). Studi Literatur: Efektivitas Model Problem Based Learning (PBL) untuk Meningkatkan Kemampuan Pemecahan Masalah Matematis terhadap Pembelajaran Matematika. *PRISMA, Prosiding Seminar Nasional Matematika*. https://doi.org/https://proceeding.unnes.ac.id/prisma

Siswanto, E., Rahayu, W., & Meiliasari, D. (2025). Optimalisasi Kemampuan Pemecahan Masalah Matematika melalui Implementasi Pembelajaran Problem Based Learning (PBL): Systematic Literature Review. *SJME (Supremum Journal of Mathematics Education)*, *09*(01), 181–195. https://doi.org/DOI:https://doi.org/10.35706/sjme.v9i1.185

Subekti, F. E., & Jazuli, A. (2020). Peningkatan Kemampuan Pemecahan Masalah dan Kemandirian Belajar Mahasiswa Melalui Pembelajaran Berbasis Masalah. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *4*(1), 13. https://doi.org/10.33603/jnpm.v4i1.2687

Syafitri, R. H., Kurniati, N., Novitasari, D., Hayati, L., Studi, P., Matematika, P., & Mipa, J. P. (2025). Pengaruh Model PBL dengan Konteks Budaya Sasambo Terhadap Kemampuan Pemecahan

Masalah Matematika Siswa. *Journal of Classroom Action Research*, *7*(1). https://doi.org/10.29303/jcar.v7i1.10337

Syamsuddin N, Simbolon G A H, Surni, Resyi A Gani, Halima Bugis, Towe Mariana Marta, Muhammad Guntur, Siti Maulidah, Muhammad Taufik, Marsela Renasari Presty, & Angela Dwi Pitri. (2023). *Dasar-Dasar Metode Penelitian Kualitatif*. https://doi.org/https://repositori.uin-alauddin.ac.id/23568/1/BUKU_Dasar-Dasar%20Metode%20Penelitian%20Kualitatif.pdf

Wijaya, Fehan Alya Rahmi Lubis, Mhd. Najib Sihab Siregar, & Azmi Ayu Fauziah Batubara. (2025). Sumber Data, Subjek Penelitian, dan Isu Terkait. *JURNAL EDUKATIF*. https://doi.org/https://ejournal.edutechjaya.com/index.php/edukatif

Wulandari Nurul Azizah Desi. (2022). Peningkatan Kemampuan Pemecahan Masalah Matematika Materi Lingkaran menggunakan Model Pembelajaran Berbasis Masalah Kelas VIII SMP Negeri 2 Tlogomulyo Tahun Pelajaran 2020/2021. In *Educatif : Journal of Education Research* (Vol. 4, Number 2). https://doi.org/https://doi.org/10.36654/educatif.v4i2.99

Yuda, E. K., & Rosmilawati, I. (2024). Literasi Numerasi di Sekolah Dasar Berdasarkan Indikator PISA 2023; Systematic Literatur Review. *Journal of Instructional and Development Researches*, *4*(3), 172–191. https://doi.org/10.53621/jider.v4i3.326