MaPan : Jurnal Matematika dan Pembelajaran
p-ISSN: 2354-6883 ; e-ISSN: 2581-172X
Volume 12, No 1, June 2024 (132-146)
DOI: https://doi.org/10.24252/mapan.2024v12n1a9

PROBLEM-BASED LEARNING WITH SCAFFOLDING TO IMPROVE NUMERACY LITERACY OF JUNIOR HIGH SCHOOL STUDENTS

Fani Laffanillah Fathurrohman[1)], Harry Dwi Putra[2)]
[1,2]Department of Mathematic Education, IKIP Siliwangi
[1,2]Jl. Terusan Jendral Sudirman, Cimahi, Indonesia
Email: laffanillah13@gmail.com[1)], harrydp@ikipsiliwangi.ac.id[2)]

Received April 30, 2024; Revised June 01, 2024; Accepted June 02, 2024

Abstract:
Numeracy literacy is crucial because it can help someone understand the role or usefulness of mathematics in their daily lives. Therefore, it is necessary to research to improve students' numeracy literacy. The purpose of this research is to take action and analyze the use of the PBL model with scaffolding to improve students' numeracy literacy. Classroom action research with Kurt Lewwin model which consists of planning, implementation, observation, and reflection. Data collection techniques using tests and observation sheets. The data analysis technique used was qualitative and quantitative analysis. The subjects of this study were students of class VII-D at SMP Negeri 5 Cimahi. Data analysis can be concluded that Problem-Based Learning with Scaffolding can improve numeracy literacy, in cycle 1, we obtained an average value of 65 with a completeness rate of 50% which amounted to 20 students, and those who did not complete there were 20 students or 50%. While in cycle 2, the average score was 73.5 with a 70% completeness rate totaling 28 students and 12 students or 30% were not complete. With the application of the Problem-Based Learning model with Scaffolding, students are more active in participating in the learning process than before the action is given.

Keywords: Numeracy Literacy, Problem-Based Learning, Scaffolding

PROBLEM-BASED LEARNING DENGAN SCAFFOLDING UNTUK MENINGKATKAN LITERASI NUMERASI SISWA SMP

Abstrak:
Literasi numerasi sangat penting karena dapat membantu seseorang memahami peran atau kegunaan matematika dalam kehidupan sehari-hari mereka. Oleh karena itu, perlu dilakukan penelitian dalam meningkatkan literasi numerasi siswa. Tujuan dari penelitian ini adalah melakukan tindakan dan menganalisis berkaitan penggunaan model PBL dengan Scaffolding untuk meningkatkan literasi numerasi siswa. Penelitian tindakan kelas (PTK) dengan model Kurt Lewwin yang terdiri dari perencanaan, pelakasanaan, observasi dan refleksi. Teknik pengumpulan data menggunakan tes dan lembar observasi. Teknik analisis data yang dilakukan adalah analisis kualitatif dan kuantitaif. Subjek penelitian ini adalah siswa kelas VII-D di SMP Negeri 5 Cimahi. Analisis data dapat disimpulkan bahwa Problem-Based Learning dengan Scaffolding dapat meningkatkan literasi numerasi, pada siklus 1

diperoleh nilai rata-rata sebesar 65 dengan tingkat ketuntasan 50% yang berjumlah 20 siswa dan yang tidak tuntas ada 20 siswa atau 50%. Sedangkan pada siklus 2 diperoleh nilai rata-rata sebesar 73,5 dengan tingkat ketuntasan 70% yang berjumlah 28 siswa dan yang tidak tuntas ada 12 siswa atau 30%. Dengan diterapkannya model Problem-Based Learning dengan Scaffolding siswa lebih aktif dalam mengikuti proses pembelajaran dibanding sebelum diberikan tindakan.

Kata Kunci: Literasi Numerasi, Problem-Based Learning, Scaffolding

How to Cite: Fathurrohman, F. L & Putra, H. D. (2024). Problem-Based Learning with Scaffolding to Improve Numeracy Literacy of Junior High School Students. *MaPan : Jurnal Matematika dan Pembelajaran*, *12*(1), 132-146. https://doi.org/10.24252/mapan.2024v12n1a9.

INTRODUCTION

Mathematics is a subject in school that plays an important role in everyday life (Rohana, Sukasno, & Purwasi, 2019). Patriana, Sutama, and Wulandari (2021) stated that mathematics is also known as a structured and systematic science, so to understand mathematics, numeracy literacy skills are needed to solve everyday problems using mathematical knowledge of both symbols and numbers. Numeracy literacy requires logical thinking so it makes it easier for someone to understand mathematics having numeracy skills will help someone understand the material, analyze problems, and solve problems (Gardner & Hatch, 1989)

Numeracy literacy is defined as the ability to be able to understand and process information through reading and writing related to basic mathematical knowledge and skills (Salsabilah & Kurniasih, 2022). Another opinion also says that numeracy literacy also includes the ability to analyze and interpret quantitative information found around us displayed in various forms (graphs, tables, and charts) of mathematics learned in the classroom using a variety of real-world situations (Guslisnawati & Syafitri, 2022). There are three indicators of ability contained in numeracy literacy, namely (1) using various kinds of numbers and symbols related to algebra to solve problems in various contexts of daily life, (2) analyzing information displayed in various forms (graphs, tables, charts, diagrams and so on), and (3) interpreting the results of the analysis to predict and make decisions (Han, Susanto, Dewayan, Pandora, Miftahussururi, Nento, & Akbari, 2017).

Numeracy literacy is very important because with numeracy literacy one can understand the role or usefulness of mathematics in their daily lives (Yayuk, Restian, & Ekowati, 2023). Where many social activities such as planning shopping, making a business, or providing information require numeracy. Such information is usually in the form of numerical or numerical values (Ashri & Pujiastuti, 2021). When the problem is often unstructured, has many ways of solving, or even no complete solution, and is related to non-mathematical factors (Sri, 2022). Based on the results of a survey conducted by the Program for International Student Assessment (PISA), the mathematical literacy skills of students in Indonesia are still low. The low numeracy literacy skills of students are because students are not accustomed to working on problem-based problems that relate to more complex everyday life. One of the learning approaches that can train students to improve literacy skills by solving question-based problems in everyday life (Guslisnawati & Syafitri, 2022).

According to previous research by Nazmai and Veni (2022), The problems faced are known from interviews conducted with several high school mathematics teachers in Pesisir Selatan Regency. In the learning process, there is still a lack of questions that measure students' numeracy literacy. Most teachers still use routine problems. Although some teachers have given numeracy literacy questions, many students still have difficulty in answering them. In addition, the availability of numeracy literacy resource books in the library is still limited, and most students are less motivated to look for other sources. This is due to the lack of assignments from teachers to find learning materials from other sources.

Efforts to improve the quality of learning can be through the selection of appropriate and innovative learning models, one of which is Problem-Based Learning (PBL). PBL is a learning model by exposes students to authentic and interesting problems so that students can compile their own knowledge, develop problem-solving skills, and find solutions to the problems given. Students in the PBL model are placed as the center of learning (student-centered), namely, students are directed to solve problems related to the material to be discussed so that creativity, challenging conditions, and contextual and diverse learning experiences will be built. The syntax of the PBL model according to Arends is: (1) provide orientation about the problem to students, (2) organize students to research, (3) assist independent/group

solutions, (4) develop and present work, and (5) analyze and evaluate the learning process (Setiawan, Diah, & Lestari, 2014).

Based on research from Awami, Yuhana, and Nindiasari (2022) revealed that numeracy literacy skills between students taught with PBL learning models and students taught with conventional learning models have significant differences. From the results of descriptive statistical analysis, the numeracy literacy skills of students taught with PBL learning models are higher than the numeracy literacy skills of students taught with conventional learning models. This is in line with the research of Simamora, Simamora, and Andriani (2022) said that there is a significant difference in the average numeracy literacy skills of students before and after learning by using the Problem-Based Learning learning model in class VIII students of Al-Manar Medan junior high school for the 2022-2023 learning year.

To help and facilitate students in learning, an approach is needed that can help make it easier for students, namely with an approach that can create a pleasant learning atmosphere. Therefore, to make students active in learning activities and also be able to improve math problem-solving skills. One way to overcome this is to implement the PBL model with Scaffolding techniques. Scaffolding was first initiated by Vygotsky, a Russian psychologist, and was further popularized by Bruner, a mathematics education expert. Vygotsky came up with the concept of scaffolding, which is to provide a certain amount of assistance to a student during the early stages of learning and then reduce the assistance and provide opportunities for the student to take over increasingly greater responsibilities as soon as he can do so (Lestari, Zaenuri, & Mulyono, 2022). So that this scaffolding will train children to be independent after getting enough help. According to previous research by Sa'adah, Ningrum, and Farikha (2021) titled scaffolding in trigonometry learning with the help of hots problems to improve mathematical numeracy literacy skills scaffolding using HOTS problem assistance can improve students' mathematical numeracy literacy skills in trigonometry learning.

Wulandari, Nuraina, Fadhilla, Saputra, and Isfayani (2023) said that scaffolding can encourage students to learn through their active involvement. However, in the learning process, students get help or guidance from the teacher so that they are more directed so that the learning implementation process and the goals to be achieved are well implemented. This is in line with the research of Akhtar (2014) said that scaffolding helps in building real

concepts in mathematics and higher-order thinking skills and will be very helpful in increasing a good level of confidence in mathematics.

Based on these things, to find out the effectiveness of Problem-Based Learning with Scaffolding in the implementation of algebra material in junior high school, the researcher intends to conduct further research using Classroom Action Research in one of the VII classes at SMP Negeri 5 Cimahi. The researcher used the research title "Problem-Based Learning with Scaffolding to Improve Numeracy Literacy of Junior High School Students".

METHODS

The type of research conducted is Classroom Action Research. Classroom Action Research is an effort to improve or enhance the quality of learning (Ginting , Kusuma, Syarif, Niku, & Furqorina, 2021). This research was conducted in four stages, namely: (1) planning, (2) implementation, (3) observation, and (4) reflection. The subjects in this study were students of class VII-D SMP Negeri 5 Cimahi which amounted to 40 students, of which 23 male students and 17 female students with the subject matter of algebra. The data analysis technique used was qualitative and quantitative analysis. This research was conducted in conjunction with learning activities using the problem-based learning model with scaffolding. The learning stages of the problem-based learning model with scaffolding include: (1) orienting students to the problem, students are given a problem to be actively involved in problem-solving; (2) organizing students, students determine and organize learning tasks related to the problems raised; (3) guiding individual and group investigations, students are encouraged (scaffolding) to gather appropriate information, obtain explanations and solve problems; (4) developing and presenting work, students plan and prepare appropriate works and share tasks with friends; and (5) analyzing and evaluating the problem-solving process, students present their work. This class action research consisted of two cycles.

1. Cycle 1

a. Planning

Activities carried out at the planning stage include:

1) Compiled a PBL lesson plan with scaffolding on the subject of algebra.
2) Compiled teaching modules
3) Prepare learner worksheets

4) Making observation sheets to see the conditions of teaching and learning activities in the classroom
5) Making student evaluation tools in the form of tests to determine student numeracy literacy

b. Implementation
1) Introduction Activity
The teacher greeted and prayed, checked attendance, and conveyed learning objectives, motivation, and apperception.
2) Core Activity
The things that teachers do in core activities are to carry out the stages of learning with the problem-based learning model, namely:
a) Provide orientation about the problem to students
b) Organizing students to research
c) Assist with group solutions
d) Develop and present work
e) Analyzing and evaluating the learning process.
3) Closing Activity
At the end of the lesson, the teacher summarizes the learning outcomes and provides information about the material to be learned at the next meeting.

c. Observation
Observations were conducted by several people, including researchers and peers. The researcher makes observations during the learning process. Observers should observe students' activities during learning and matters related to students' interests. Then, the observation results are analyzed to find out students' interests and their way of learning.

d. Reflection
At the reflection stage, all the results of observations, student evaluations, and field notes are analyzed, explained, and concluded. The purpose of reflection is to determine the increased learning interest in students. The researcher examined the results of the first cycle of action to determine whether a further cycle was needed.

2. Cycle 2

Cycle 2 is an improvement from the imperfect cycle 1. In general, learning was implemented in cycle 2 with more thoroughness and attention to what had not been achieved in cycle 1. This is done to achieve the expected

results, namely, students can improve their numeracy literacy using the Problem-Based Learning (PBL) model with Scaffolding.

The data analysis technique used was qualitative and quantitative analysis. Qualitative analysis is used to manage observation data during the cycle action process, namely looking at the strengths and weaknesses in the cycle action using the PBL model with Scaffolding. Activities in data analysis are data reduction, data display, and conclusion drawing/data verification. Quantitative analysis is used to process data on student learning outcomes to determine the improvement of numeracy literacy using the PBL model with Scaffolding.

At the end of the implementation, students will be assessed to determine the extent of student's success in the learning process. The results obtained will be converted into a five-scale assessment. The level of learning achievement of students can be measured by comparing the average percentage value to a scale of five with the following standard.

Table 1. Category of Student Learning Outcomes

No.	Score Interval	Category
1.	$90 < Score \leq 100$	Very Good
2.	$80 < Score \leq 90$	Good
3.	$65 < Score \leq 80$	Fair
4.	$55 < Score \leq 65$	Insufficient
5.	$Score \leq 55$	Very Poor

RESULTS AND DISCUSSION

The purpose of this study was to evaluate the numeracy literacy level of students in class VII-D SMP Negeri 5 Cimahi before and after applying PBL learning with scaffolding. The results of the interview between the researcher and the mathematics teacher of class VII-D SMP Negeri 5 Cimahi showed that only half of the total students could follow the learning well, and some of them had difficulty understanding the material. This is due to the lack of practice in numeracy literacy problems, as expressed in the interview. In addition, the lack of support and guidance from parents is also a factor that affects students' understanding of math lessons.

1. Description of Students' Initial Ability before Action (Pre-Cycle)

Table 2. Initial Data Statistics Before Implementation of Action (Pre-Cycle)

No.	Statistic	Statistical Value
1.	Number of Students	40
2.	Ideal Score	100
3.	Maximum Value	85
4.	Minimum Value	30
5.	Score Range	55
6.	Average Score	57,25
7.	Standard Deviation	15,06

Source: Processed data (2024)

If the scores of students' learning outcomes are grouped into 3 categories, the frequency distribution of scores is obtained as presented in the following table.

Table 3. Frequency Distribution of Student Learning Outcomes Before Implementation of Action

No.	Score Interval	Category	Frequency	Percentage (%)
1.	$90 < Score \leq 100$	Very Good	0	0
2.	$80 < Score \leq 90$	Good	2	5
3.	$65 < Score \leq 80$	Fair	6	15
4.	$55 < Score \leq 65$	Insufficient	9	22,5
5.	$Score \leq 55$	Very Poor	23	57,5
	Total		40	100

Source: Processed data (2024)

By the average score of students' math learning outcomes before the implementation of the action of 57.25 if converted into the category table, then the average value of students' math learning outcomes is in the insufficient category.

Table 4. Students' Mathematics Learning Completeness Before the Implementation of Action

No.	Percentage Score	Category	Frequency	Percentage (%)
1.	$0 < Score \leq 65$	Not Completed	32	80
2.	$65 < Score \leq 100$	Completed	8	20
	Total		40	100

Source: Processed data (2024)

2. Description of Research Results After Implementation of Action

a. Cycle 1 Results

Based on the results of learning implementation as well as observation and evaluation in cycle 1, it can be concluded that researchers still face several obstacles. One of them is that some students often leave their seats during the test and tend to ignore the test given, which results in learning becoming Insufficiently conducive. In addition, during the learning process, some students still did not fully understand the material being taught.

Table 5. Data Statistics After Implementation of Cycle 1 Action

No.	Statistics	Statistical Value
1.	Number of Students	40
2.	Ideal Score	100
3.	Maximum Value	90
4.	Minimum Value	35
5.	Score Range	55
6.	Average Score	65
7.	Standard Deviation	17,43

Source: Processed data (2024)

Table 6. Frequency Distribution of Student Learning Outcomes after Implementation of Cycle 1 Action

No.	Score Interval	Category	Frequency	Percentage (%)
1.	$90 < Score \leq 100$	Very Good	0	0
2.	$80 < Score \leq 90$	Good	6	15
3.	$65 < Score \leq 80$	Fair	14	35
4.	$55 < Score \leq 65$	Insufficient	9	22,75
5.	$Score \leq 55$	Very Poor	11	27,5
	Total		40	100

Source: Processed data (2024)

In accordance with the average score of students' mathematics learning outcomes after the implementation of cycle 1 action of 65, if converted into the category table, the average score of students' mathematics learning outcomes is in the insufficient category. The completeness of student learning outcomes in this cycle after being analyzed is shown in the following table.

Table 7. Students' Mathematics Learning Completeness After Implementation of Cycle 1 Action

No.	Percentage Score	Category	Frequency	Percentage (%)
1.	$0 < Score \leq 65$	Not Completed	20	50
2.	$65 < Score \leq 100$	Completed	20	50
Total			40	100

Source: Processed data (2024)

Based on the table above, it can be seen that the value of student learning outcomes from 40 students, in mathematics subjects. The percentage of student learning completeness is 20 students (50%). While students who are not completed are 20 students (50%). The lowest score category is 35, while the highest is 90 and the average score in this cycle 1 learning is 65. Because the final results of cycle 1 have not shown optimum results, it is necessary to continue in cycle 2 with various improvements based on the reflection in cycle 1. As for the class action process, it is carried out the same as the first class action which begins with planning and ends with reflection.

b. Cycle 2 Result

The implementation of activities in cycle 2 went according to the plan that had been prepared by the researcher, despite facing obstacles that often arise in the field. These obstacles were similar to those encountered during the implementation of cycle 1, especially related to the lack of classroom conduciveness which required more attention from the researcher during the learning process.

Table 8. Data Statistics After Implementation of Cycle 2 Action

No.	Statistics	Statistical Value
1.	Number of Students	40
2.	Ideal Score	100
3.	Maximum Value	100
4.	Minimum Value	50
5.	Score Range	50
6.	Average Score	73,5
7.	Standard Deviation	14,37

Source: Processed data (2024)

Table 9. Frequency Distribution of Student Learning Outcomes after Implementation of Cycle 2 Action

No.	Score Interval	Category	Frequency	Percentage (%)
1.	$90 < Score \leq 100$	Very Good	3	7,5
2.	$80 < Score \leq 90$	Good	7	17,5
3.	$65 < Score \leq 80$	Fair	18	45
4.	$55 < Score \leq 65$	Insufficient	5	12,5
5.	$Score \leq 55$	Very Poor	7	17,5
Total			40	100

Source: Processed data (2024)

In accordance with the average score of students' mathematics learning outcomes after the implementation of cycle 2 action of 71.5, if converted into the Category table, the average score of students' mathematics learning outcomes is in the Fair Category. The completeness of student learning outcomes in this cycle after being analyzed is shown in the following table.

Table 10. Students' Mathematics Learning Completeness After Implementation of Cycle 2 Action

No.	Percentage Score	Category	Frequency	Percentage (%)
1.	$0 < Score \leq 65$	Not Completed	12	30
2.	$65 < Score \leq 100$	Completed	28	70
Total			40	100

Source: Processed data (2024)

Based on the table above, it can be seen that the value of student learning outcomes from 40 students, in mathematics subjects. The percentage of student learning completeness is 28 students (70%). While there are 12 students (30%) who are not complete. The lowest score category is 50, while the highest is 100 and the average score in this cycle 1 learning is 73.5.

From pre-cycle to cycle 1, there were no students who reached Category Very Good with an interval of 90 < scores ≤ 100. However, from the results of cycle 2, 3 students reached Category Very Good with an interval of 90<scores≤100. In cycle 2, there were 3 students, or 7.5% who entered Category Very Good, 7 students, or 17.5% who entered Category Good, 18 students, or 45% who entered Category Fair, 5 students, or 12.5% who entered Category Insufficient, and 7 students or 17.5% who entered Category Very Poor. The researcher also realized the shortcomings in the presentation and delivery of

material due to the use of props that Insufficiently attracted students' attention, thus affecting the learning atmosphere in the classroom.

Table 11. Student Learning Outcomes at Pre-Cycle, Cycle 1, and Cycle 2

No.	Value Description	The average score of completeness
1.	Pre-Cycle	20%
2.	Cycle 1	50%
3.	Cycle 2	70%

Source: Processed data (2024)

Based on the table above, it can be seen that the results of learning completeness in the learning process carried out in two cycles have increased. It is proven that the application of the Problem-Based Learning model with Scaffolding can improve student numeracy literacy Scaffolding implemented by researchers can improve the learning outcomes of mathematics algebra material of students in class VII-D SMP Negeri 5 Cimahi. From the results of cycles 1 to 2, although there are still students who are not complete, there is an increase in student learning outcomes in numeracy literacy. These results are in line with research conducted by previous researchers that the use of the Problem-Based Learning (PBL) model has a positive impact in helping to improve students' numeracy literacy skills (Simamora, Simamora, & Andriani 2022). Scaffolding is also able to improve students' numeracy literacy skills by assisting in the form of instructions in the process, brief explanations in problem-solving, providing examples, and encouraging learning (Sa'adah, Ningrum, & Farikha 2021). This can be seen in the changes in student learning outcomes from pre-cycle, cycle 1, and cycle 2 in the following figure.

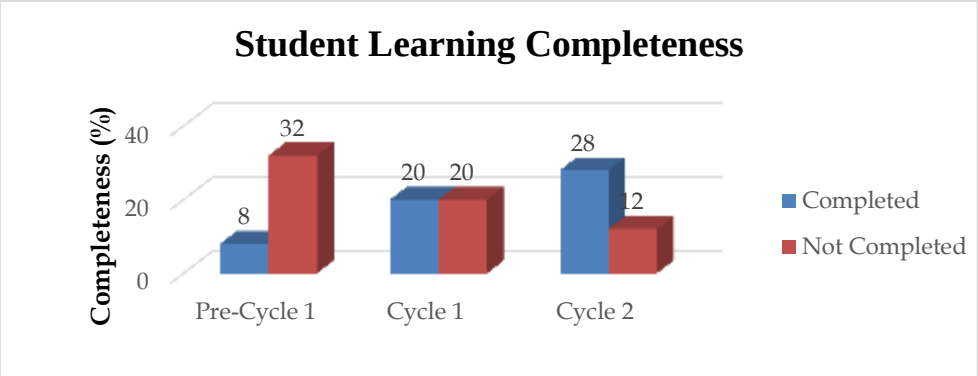

Figure 1. The Comparison of the Students' Mathematics Learning Outcomes

CONCLUSION

Based on the results and discussion, it can be concluded that the Problem-Based Learning model with Scaffolding can improve the numeracy literacy of students in class VII-D SMP Negeri 5 Cimahi. In cycle 1, the average score was 65 with a completion rate of 50% which amounted to 20 students and those who were Not Completed were 20 students or 50%. While in cycle 2 obtained an average value of 73.5 with a level of completion and 70% which amounted to 28 students and Not Completed there were 12 students or 30%. By applying the Problem-Based Learning model with Scaffolding, students are more active in participating in the learning process than before the action is given.

REFERENCES

Akhtar, M. (2014). Patterns of scaffolds in one-to-one mathematics teaching: an Analysis. *Educational Research International*, *3*(1), 71–79.

Ashri, D. N., & Pujiastuti, H. (2021). Literasi numerasi pada pembelajaran tematik terpadu di kelas rendah sekolah dasar. *Jurnal Karya Pendidikan Matematika*, *8*(2), 1–7. https://doi.org/10.26714/jkpm.8.2.2021.1-7.

Awami, F., Yuhana, Y., & Nindiasari, H. (2022). Meningkatkkan kemampuan literasi numerasi dengan model problem based learning (PBL) ditinjau dari self confidence siswa SMK. *Mendidik: Jurnal Kajian Pendidikan Dan Pengajaran*, *8*(2), 231–243. https://doi.org/10.30653/003.202282.236.

Gardner, H., & Hatch, T. (1989). Educational implications of the theory of multiple intelligences. *Educational Researcher*, *18*(8), 4–10. https://doi.org/10.3102/0013189X018008004.

Ginting, A. L., Kusuma, J. P., Syarif, M., Niku, E., & Furqorina, R. (2021). Penulisan karya ilmiah & PTK bagi guru KB/TK untuk peningkatan kompetensi guru. *Jurnal Sinergi: Pengabdian ummat*, *4*(1), 11–16. https://doi.org/10.31764/sjpu.v4i1.4868.

Guslisnawati, & Syafitri, E. (2022). Meningkatkan kemampuan literasi numerasi siswa melalui penerapan model pembelajaran PBL berbasis stem. *Jurnal Mathematic Paedagogic*, *7*(1), 62–71.

Han, W., Susanto, D., Dewayan, S., Pandora, N., Miftahussururi, Nento, M. N., & Akbari, Q. S. (2017). Materi pendukung literasi numerasi. In *Kementerian Pendidikan dan Kebudayaan*. Kementerian Pendidikan dan Kebudayaan.

Lestari, I. S., Zaenuri, & Mulyono. (2022). Literasi matematika ditinjau dari self efficacy dengan menggunakan problem solving learning model dengan strategi scaffolding. *Jurnal Inovasi Sekolah Dasar*, *9*(1), 27–35. https://doi.org/10.36706/jisd.v9i1.17091.

Nazmai, Y., & Veni, V. (2022). Pencapaian kompetensi literasi numerasi siswa dengan model problem based learning. *Jurnal Kepemimpinan Dan Pengurusan Sekolah*, *7*(3), 394–399. https://doi.org/10.34125/kp.v7i3.853.

Patriana, W. D., Sutama, & Wulandari, M. D. (2021). Pembudayaan literasi numerasi untuk asesmen kompetensi minimum dalam kegiatan kurikuler pada sekolah dasar muhammadiyah. *Jurnal Basicedu*, *5*(5), 3413–3429. https://doi.org/10.31004/basicedu.v5i5.1302.

Rohana, D., Sukasno, S., & Purwasi, L. A. (2019). Model problem based learning (PBL) dengan teknik scaffolding terhadap kemampuan pemecahan masalah matematika. *Jurnal Pendidikan Matematika RAFA*, *5*(2), 142–151. https://doi.org/10.19109/jpmrafa.v5i2.4136.

Sa'adah, A., Ningrum, F. Z., & Farikha, N. (2021). Scaffolding dalam pembelajaran trigonometri berbantuan soal hots untuk meningkatkan kemampuan literasi numerasi matematika. *Seminar Nasional Pendidikan Matematika UNIKAL*, *2*(1), 167–174.

Salsabilah, A. P., & Kurniasih, M. D. (2022). Analisis kemampuan literasi numerasi ditinjau dari efikasi diri pada peserta didik SMP. *Edumatica : Jurnal Pendidikan Matematika*, *12*(2), 138–149. https://doi.org/10.22437/edumatica.v12i02.18429.

Setiawan, H., Diah, N., Lestari, S. (2014). Soal matematika dalam PISA kaitannya dengan literasi matematika dan keterampilan berpikir tingkat tinggi. *Prosiding Seminar Nasional Matematika*, *November*, 244–251.

Simamora, Y., Simamora, M. I., & Andriani, K. (2022). Pengaruh model problem based learning (PBL) berbasis etnomatematika untuk meningkatkan kemampuan literasi numerasi matematik siswa SMP. *Jurnal Matematika Sigma*, *8*(2), 532–538. https://doi.org/10.36987/jpms.v8i2.3675.

Sri, A. (2022). Peningkatan Kemampuan numerasi melalui problem based learning (PBL) pada siswa kelas VI SDN Oro-Oro Ombo 02 Kota Batu. *Jurnal Pendidikan Taman Widya Humaniora (JPTWH)*, *1*(3), 561–582. Retrieved from https://jurnal.widyahumaniora.org/index.php/jptwh/article/view/75.

Wulandari, Nuraina, Fadhilla, M., Saputra, E., & Isfayani, E. (2023). Penerapan metode scaffolding berbantuan soal hots untuk meningkatkan kemampuan berpikir kritis matematis siswa pada materi trigonometri. *Jurnal Serambi Ilmu*, *24*(1), 30–41. https://doi.org/10.32672/si.v25i1.5789.

Yayuk, E., Restian, A., & Ekowati, D. W. (2023). Literasi numerasi dalam kerangka kurikulum merdeka berbasis art education. *International Journal of Community Service Learning*, *7*(2), 228–238. https://doi.org/10.23887/ijcsl.v7i2.56278.