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The influence of the PBL model on Mathematics learning outcomes in primary school

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ABSTRACT
Mathematics is an important subject for developing logical thinking and problem-solving skills; however, many students exhibit low learning outcomes due to passive and less relevant teaching methods. This study examines the effect of the Problem-Based Learning (PBL) model on the mathematics learning outcomes of fifth-grade students at SDN Batu Ampar 09 Pagi, Jakarta. This study aims to determine whether PBL can improve mathematics learning outcomes compared to traditional methods. The study employed a quasi-experimental design, involving two groups: an experimental group that used PBL and a control group that used conventional methods. Data were collected through pretests and posttests, then analyzed using statistical tests. The results showed a significant increase in mathematics learning outcomes in the group using PBL, indicating that PBL is effective in improving students' mathematical understanding, encouraging active learning, and developing critical thinking. This study offers a practical overview for teachers to adopt the PBL model in mathematics education, aiming to enhance students' problem-solving skills.

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ABSTRAK
Matematika menjadi salah satu mata pelajaran yang penting untuk mengembangkan pemikiran logis dan keterampilan pemecahan masalah, namun banyak peserta didik yang menunjukkan hasil belajar rendah akibat metode pengajaran yang pasif dan kurang relevan. Penelitian ini mengkaji pengaruh model Pembelajaran Berbasis Masalah (PBL) terhadap hasil belajar Matematika peserta didik kelas V SDN Batu Ampar 09 Pagi, Jakarta. Penelitian ini bertujuan untuk mengetahui apakah PBL dapat meningkatkan hasil belajar Matematika dibandingkan dengan metode tradisional. Penelitian dilakukan dengan desain kuasi-eksperimental yang melibatkan dua kelompok, yakni kelompok eksperimen yang menggunakan PBL dan kelompok kontrol yang menggunakan metode konvensional. Data dikumpulkan melalui pretest dan posttest, kemudian dianalisis dengan uji statistik. Hasil penelitian menunjukkan adanya peningkatan signifikan pada hasil belajar Matematika di kelompok yang menggunakan PBL, yang menandakan bahwa PBL efektif dalam meningkatkan pemahaman Matematika peserta didik, mendorong pembelajaran aktif, dan mengembangkan pemikiran kritis. Penelitian ini memberikan gambaran praktis bagi guru guna mengadopsi model PBL dalam pembelajaran Matematika untuk meningkatkan keterampilan pemecahan masalah peserta didik.
Kata Kunci: *hasil belajar Matematika; pembelajaran berbasis masalah; pendidikan dasar*

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INTRODUCTION

Education is an effort, in various ways, to actively develop students, including reasoning, scientific intelligence, sharpening the mind, developing spiritual strength, self-control, and other skills (Sanga & Wangdra, 2023). The goal of education is to realize the cultural inheritance from one generation to the next. Education shapes the next generation into role models, passing on the values and knowledge of the previous generation (Rahman *et al*., 2022; Yustikarini, 2023). Schools serve as a means of supporting education to achieve its goal of developing students' potential, both academically and non-academically. Mathematics is a compulsory subject for all students, from elementary school through to the next level. This is to help students think logically, analytically, systematically, and critically (Wijayanti & Yanto, 2023).

Mathematics plays a vital role in shaping individuals' minds and advancing understanding of the world around us, as one of the fundamental sciences. Its influence extends to every aspect of modern society (Tutiana *et al*., 2023). Mathematics is essentially a tool for developing ways of thinking; its knowledge is applied in everyday life and in advancing Science and Technology (IPTEK), so it should be provided to students from the kindergarten level (Jannah & Hayati, 2024). Initial observations at SDN Batu Ampar 09 Pagi showed that students' Mathematics learning outcomes remained low, with many failing to meet the Mastery Level Completion Criteria (KKTP) of 75. Students tended to be passive and uninvolved in the learning process because of the boring teaching style. Skills and knowledge were used to solve Mathematics problems (Davita & Pujiastuti, 2020).

A teacher needs to create a Mathematics learning atmosphere that fosters strong problem-solving skills, is easy to understand, fun, and free of boredom during the Mathematics learning process (Putra, 2021). One learning model that can motivate students to learn is Problem-Based Learning (PBL), which emphasizes student activities to find solutions to real-world problems (Meilasari *et al*., 2020).PBL is an innovative learning model that provides active learning conditions for students through the scientific method stages, enabling them to learn knowledge related to the problem and, at the same time, develop the skills to solve it (Amarullah *et al*., 2025; Sari *et al*., 2021).

Several previous studies have shown significant differences between PBL and conventional learning models. This is particularly true in mathematics, where students' learning outcomes have improved, and their problem-solving skills have increased (Hendra, 2021; Sagita & Ikashaum, 2023). The application of PBL can foster students' motivation in learning. Therefore, this study offers a novel approach by applying the PBL learning model specifically to fractions among fifth-grade students at SDN Batu Ampar 09 Pagi. Unlike previous studies that were more general or at higher levels, this study used a quasi-experimental design in elementary schools with initial observations indicating low learning outcomes.

The research problem formulation of this study is "Is there an influence of PBL on the Mathematics learning outcomes of fifth-grade students of SDN Batu Ampar 09 Pagi?" The purpose of this study is to test the hypothesis using a quasi-experimental design, analyze the influence of PBL on the Mathematics learning outcomes of fifth-grade students, and provide practical recommendations for educators in elementary schools. This study is

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expected to provide empirical contributions to improving Mathematics learning outcomes in urban contexts with a limited but representative sample of students.

LITERATURE REVIEW

Problem-Based Learning (PBL) Learning Model

A learning model is a strategy or style teachers use to carry out learning activities. One learning model used to increase student activity in learning activities is PBL (Nursanti *et al*., 2023). PBL trains students to think critically to solve problems. In addition to acquiring information and developing knowledge about topics, students also learn how to frame problems, collect and analyze them, organize facts and opinions about a problem, and work in groups and individually to solve problems (Hasana *et al*., 2023).

PBL is a model that actively directs students in learning by presenting a problem and asking questions that enable students to construct their own knowledge (Handayani & Muhammadi, 2020). PBL develops higher-order thinking skills because, through problem-based learning, students learn to solve real-world problems in a structured manner, thereby constructing their knowledge. Problems, as the starting point for learning, should be designed and selected to be of high quality and relevant to students' real-world experiences, to stimulate cognitive, affective, and psychomotor skills, and to enable students to find solutions in group discussions with peers (Darwati & Purana, 2021).

The advantages of the PBL model include: 1) students are required to have high-level thinking skills and are actively involved in problem-solving skills; 2) embedded learning based on the schemes owned by students so that learning is more meaningful; 3) directly feel the benefits of learning due to the problems solved being linked to real life as motivation and learning materials that attract students to learn; 4) make students more mature and independent, provide aspirations and accept the opinions of others, instill a positive social attitude to other students and; 5) able to create learning conditions in groups, create interactions between students (Mardani *et al*., 2021).

The PBL learning model has another advantage: it can foster students' creativity, both individually and in groups, thereby enabling the achievement of learning outcomes with maximum completeness (Mardani *et al*., 2021). Besides its advantages, PBL has two main disadvantages in its use, including: 1) When students do not have interest or do not believe that the problem being studied is difficult to solve, they will feel reluctant to try it; 2) Some students assume that without understanding the material needed to solve the problem, why should they try to solve the problem being studied, then they will learn what they want to learn (Hotimah, 2020).

In implementing the learning model, a structured procedure is needed to ensure effective learning. The steps of PBL are: 1) Organizing students towards the problem means the teacher explains the learning objectives, explains the logistics needed, proposes phenomena or demonstrations or stories to raise the problem, motivates students to be involved in solving the chosen problem; 2) Organizing students to learn means the teacher helps define and organize learning tasks related to the problem; 3) Guiding individual and group investigations means the teacher encourages students to gather appropriate information, carry out experiments, to get explanations for solving the problem; 4) Developing and

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presenting work results means the teacher helps students plan and prepare appropriate work such as reports, videos, and models and helps them to share tasks with their friends; 5) Analyzing and evaluating the problem-solving process means the teacher helps students to reflect or evaluate their investigations and the processes they use (Farhani *et al*., 2022).

Mathematics Learning Outcomes

Learning outcomes are the results of the learning process and are influenced by various factors. Learning outcomes are components of learning that must be mastered for educational purposes. This is because learning outcomes are measured to determine the achievement of educational goals through the teaching and learning process (Nahdania & Ain, 2024). Learning outcomes include students' cognitive, psychomotor, and affective skills, which improve after the teaching and learning process. Student learning outcomes are determined by the students themselves, who want to build their knowledge (Oktaviani *et al*., 2020). Mathematics learning outcomes are essentially the grades students obtain after completing the learning process. More specifically, mathematics learning outcomes refer to students' abilities in mathematics, acquired through experience and practice during the learning process, and reflect their mastery of the subject matter (Khaesarani, 2021).

Mathematics learning outcomes are reflected in problem-solving abilities. High mathematics learning outcomes indicate an effective learning process. Conversely, low mathematics learning outcomes indicate an ineffective learning process. Several factors influence success or failure in learning. Factors influencing learning outcomes are categorized into two categories: internal factors and external factors (Novianti *et al*., 2020). Internal factors, such as lack of interest, talent, motivation, and students' intelligence levels, affect their ability to listen to and understand the material presented during the learning process, leading students always to assume that Mathematics is a difficult subject to learn.

Generally, the primary cause of learning is external factors. This includes several factors: ineffective learning strategies, poorly managed learning activities that fail to motivate students, learning processes that discourage critical thinking, and environmental factors that significantly impact student learning outcomes and achievement (Wibowo *et al*., 2021). Among the factors mentioned above, one can significantly influence student learning outcomes: the learning motivation factor (Nugroho & Warmi, 2022). Learning motivation can be defined as the overall motivation of students, which drives learning activities and ensures their continuity, providing direction to achieve desired goals (Winata, 2021).

METHODS

This study uses a quantitative approach to collect and analyze numerical data to test the hypothesis of the effect of PBL on Mathematics learning outcomes. The research design chosen for this study is a quasi-experimental design with a no-equivalent control group. The experimental and control groups were not selected randomly; the control group was included to control for external variables. Class VA was designated as the experimental group (receiving PBL) and Class VB as the control (conventional method). The study population included all fifth-grade students of SDN Batu Ampar 09 Pagi, with a sample consisting of 23 class VA students and 17 class VB students, totaling 40 students. The sample was selected

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using a purposive sampling technique to identify special identities that align with the research objectives, so they are expected to respond to the research case.

The research stages carried out include:

1. The preparation of pretest and posttest instruments in the form of 20 multiple-choice questions based on basic competency indicators on fraction material that are adjusted to the instrument grid.
2. The instrument feasibility test was conducted by distributing 20 initial questions to 30 fifth-grade students with similar characteristics, followed by a validity test using the Product-Moment formula to determine the relationship between the two variables. In this test, all 20 questions were declared valid (r_calculated > r_table 0.3610). Reliability was tested using Cronbach's Alpha. Generally, a good reliability test has a Cronbach's alpha of 0.6 or higher. In this study, the reliability test produced a value of 0.861 (>0.6), indicating a reliable instrument.
3. Learning implementation. In the first week, both classes received conventional instruction on fractions without PBL, culminating in a pretest. In the second week, class VA implemented the PBL model with the following steps: problem orientation (presentation of real problems related to fractions), student organization into groups, individual/group investigations using teaching modules and worksheets, development and presentation of results, and analysis and evaluation, culminating in a posttest. In the third week, class VB continued using the conventional method and concluded with a posttest. The posttest was given to both classes with the same 20 questions. The research was conducted from October 2024 until the even semester of 2024/2025 at SDN Batu Ampar 09 Pagi, East Jakarta.

The hypothesis in this research is as follows:

Null hypothesis (H0):
"There is no influence of the PBL learning model on Mathematics learning outcomes."

Alternative hypothesis (H1):

"There is an influence of the PBL learning model on mathematics learning outcomes."

Data analysis focused on data description, requirement testing, and hypothesis testing. Data description involved frequency distributions, means, modes, standard deviations, highest, and lowest scores using SPSS v.27. Normality testing was performed using the Shapiro-Wilk test to ensure normality, resulting in a Sig. value for the experimental posttest of 0.066 and a control of 0.093 (>0.05). Homogeneity testing used Levene's Test for Equality of Variances with a Sig. of 0.474 (>0.05), indicating homogeneous variances. Hypothesis testing used the Independent Samples T-Test to compare posttest means between groups with the criteria: if Sig. (2-tailed) <0.05, H0 is rejected. The results showed a Sig. of 0.017 (<0.05), so H1 was accepted. Effect sizes were calculated using Cohen's d (0.796), Hedges' g (0.780), and Glass's delta (0.889), all indicating a large effect.

RESULTS AND DISCUSSION

The preparation of pretest and posttest instruments in the form of 20 multiple-choice questions based on basic competency indicators on fraction material that are adjusted to the

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instrument grid. Next, the instrument's feasibility was tested by administering the initial 20 questions to 30 fifth-grade students with similar characteristics. The post-test instrument validity test included all 20 items and was administered to 30 fifth-grade student respondents. The level was 0.05, and r_table = 0.3610. Therefore, all items were deemed valid and suitable for use as research instruments.

Table 1. *Output* Reliability

No	*Cronbach's Alpha*	Koefisien r	Conclusion
1	0,861	0,6	Reliabel

Source: Research 2025

Based on the results of Cronbach's Alpha reliability in **Table 1**, the instrument is reliable, as the value obtained (0.861) is> 0.6

Table 2. Frequency Distribution of Experimental Class Posttest Results

No	Value	Frequency	Percentage (%)
1	70	2	8,7
2	75	3	13,0
3	80	4	17,4
4	85	5	21,7
5	90	4	17,4
6	95	5	21,7

Source: Research 2025

Based on **Table 2**, the frequency distribution of the experimental class posttest (VA, n=23) shows that the majority of values are above 80 (78.3%), with a mean of 84.57.

Table 3. Frequency Distribution of Control Class Posttest Results

No	Nilai	Frequency	Persentase (%)
1	70	4	23,5
2	75	3	17,6
3	80	4	23,5
4	85	3	17,6
5	90	3	17,6

Source: Research 2025

Meanwhile, the results of the control class posttest in **Table 3** show that VB (n=17) was concentrated at 70-80 (70.6%), with a mean of 78.53.

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Table 4. Test of Mean, Mode, Deviation, Highest, and Lowest Values

No	Group	*Pretest Mean*	*Posttest Mean*	*Std. Dev. Pretest*	*Std. Dev. Posttest*	*Min Pretest*	*Max Pretest*	*Min Posttest*	*Max Posttest*
1	Eksperimental	65,00	84,57	9,415	8,106	50	80	70	95
2	Kontrol	65,00	78,53	10,000	6,793	50	80	70	90

Source: Research 2025

There was a significant increase in the experimental group from a pretest average score of 65.00 to 84.57 in the post-test, with the minimum score increasing from 50 to 70 and the maximum score increasing from 80 to 95. In addition, a decrease in the standard deviation from 9.415 to 8.106. Meanwhile, the control group also experienced an increase in the average from 65.00 to 78.53, but the increase was not as large as that of the experimental group. The maximum score increased from 80 to 90 and the minimum score from 50 to 70, with a decrease in the standard deviation from 10.000 to 6.793 (see **Table 4**).

Table 5. Shapiro-Wilk Normality Output

No	Group	*Statistic*	df	*Sig.*
1	*Experimental* Posttest	-	23	0,066
2	Control Posttest	-	17	0,093

Source: Research 2025

Based on the results of the Shapiro-Wilk normality test (see **Table 5**), in the experimental group, 0.066, and the control group, 0.093, because all Sig. values > 0.05, it can be concluded that the learning outcome data in both groups are normally distributed.

Table 6. *Output* Homogeneity

No	*Based on*	*Sig.*
1	*Mean*	0,474
2	*Median*	0,505

Source: Research 2025

Based on the results of the homogeneity of variance test using the Levene Test in Table 6, a Sig. A value> 0.05 was obtained for all approaches based on the mean (0.474) and the median (0.505). This indicates that the variance of the Mathematics learning outcome data in the experimental and control groups is homogeneous.

Hypothesis Testing

The hypothesis test in this study was the Independent Sample T-Test, a parametric statistical test. This test aims to determine the difference in the means of two sample groups. Based on the explanation presented, the following research hypothesis can be proposed:

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H0: There is no effect of PBL on fifth-grade Mathematics learning outcomes

H1: There is an effect of PBL on fifth-grade Mathematics learning outcomes

Table 7. Independent Samples T-Test

No	Assumptions	*Sig. (2-tailed)*	*Mean Difference*
1	*Equal variances assumed*	0,017	6,036
2	*Equal variances not assumed*	0,015	6,036

Source: Research 2025

Independent Samples T-Test shows Sig. (2-tailed) 0.017 (<0.05) H0 is rejected on Equal variances assumed. This shows that there is a statistically significant difference in the Mathematics learning outcomes between the experimental and control groups (see Table 7).

Table 8. Independent Samples Effect Sizes

No	*Effect Size*	*Value*
1	*Cohen's d*	0,796
2	*Hedges' correction*	0,780
3	*Glass's delta*	0,889

Source: Research 2025

The three effect size values in Table 8 indicate a large effect category because they are above the threshold of 0.8. This indicates that the differences between the experimental and control groups are not only statistically significant but also practically meaningful in the context of education. These results address the problem formulation by demonstrating the significant influence of PBL on Mathematics learning outcomes, with a mean increase of 19.57 in the PBL class, exceeding 13.53 in the control. It can be concluded that PBL, as an approach, helps students to improve their ability to understand the teaching material.

Discussion

The study found that PBL had a positive and significant effect on the Mathematics learning outcomes of fifth-grade students at SDN Batu Ampar 09 Pagi. This was demonstrated by an Independent Samples T-Test with a p-value of 0.017 (<0.05), indicating a statistically significant difference in Mathematics learning outcomes between the experimental and control groups. The effect size test (Cohen's d = 0.796) was classified as a large effect because it was close to 0.8. This showed that the treatment given to the experimental group had a strong impact on improving Mathematics learning outcomes. The pretest score of the experimental class was 65; after applying the PBL model, the post-test score increased to 84.57. The control class's pretest score of 65 increased to 78.53 on the post-test. Although not as large as the increase in the experimental class, the control class also showed an increase without treatment.

Empirically, this study shows that students taught using the PBL model achieve higher average grades than those taught using the conventional model. This indicates that PBL not only improves cognitive abilities but also encourages critical thinking, collaboration, and

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mathematical communication skills. Students are more active in asking questions, discussing, and seeking alternative strategies for solving fraction problems, so the concepts they learn are more durable in their memory. (Hermanto *et al*., 2022). The results of this study align with previous studies that found that the treatment given significantly influenced PBL and student learning outcomes in elementary schools (Rahmawati & Wijaya, 2023). The implementation of PBL in Mathematics classes should focus on students' problem-solving activities.

At least, the implementation of Mathematics learning with PBL consists of 5 stages, namely: 1) orienting students to the problem; 2) organizing students to learn; 3) guiding individual and group investigations; 4) developing and presenting work results; 5) analyzing and evaluating the problem-solving process (Hasanah *et al*., 2023). These learning stages provide students with the opportunity to construct their own knowledge. PBL itself helps build independent learning, including in Mathematics (Darwati & Purana, 2021; Kanah & Mardiani, 2022). Based on research results, the application of PBL has proven effective in improving students' Mathematics learning outcomes.

On the other hand, in order to make PBL learning effective, the role of the teacher is very crucial, where the teacher plays a role in preparing problem scenarios, triggering and stimulating students in practicing their critical thinking, leading discussions, and guiding students in solving the problems themselves (Affandi, 2023; Handayani & Muhammadi, 2020; Juraidah & Hartoyo, 2022;). When preparing for a PBL class, teachers often need more time to develop problem scenarios that are appropriate for students' cognitive developmental levels. Furthermore, not all students are accustomed to problem-based learning. Some passive students tend to have difficulty expressing ideas or actively participating in group discussions. Therefore, the teacher's role as a facilitator is crucial in guiding the discussion, providing stimulus through guiding questions, and ensuring that all group members are involved (Furqanisah & Arifin, 2024; Yuniar *et al*., 2022). This finding strengthens the relationship between PBL and improved Mathematics learning outcomes in fraction material in grade V. This model is effective because it integrates Mathematics concepts with real-world situations, trains critical thinking skills, and provides a more in-depth learning experience.

CONCLUSION

Based on the research data obtained, there is a difference in Mathematics learning outcomes between the experimental and control classes. The improvement in learning outcomes in the experimental class indicates that implementing the Problem-Based Learning (PBL) model has a significant positive impact on the Mathematics learning of fifth-grade students at SDN Batu Ampar 09 Pagi. PBL facilitates students in solving real-world problems, thereby improving their understanding of fraction concepts and reducing variability in learning outcomes, in line with the educational goal of holistically developing knowledge, attitudes, and skills. The implications of these findings include theoretical contributions that enrich the study of PBL at the urban elementary school level, as well as practical implications for teachers adopting this approach to achieve higher Mastery Level Completion Criteria (KKTP) and build students' problem-solving skills. For educational institutions, these results encourage teacher training and more contextually relevant curriculum development. At the same time, from a public

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health perspective, PBL can serve as a foundation for numerical literacy, supporting early epidemiological data analysis and thereby reducing the burden of chronic diseases through preventive education. It is recommended that teachers implement PBL gradually, with adequate training, to optimize Mathematics learning outcomes. At the same time, for future researchers, it is necessary to expand the scope to other levels and non-cognitive variables, such as motivation, using a mixed-methods approach, so that the findings are more in-depth, given the limited sample and time in this study.

AUTHOR'S NOTE

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REFERENCES

Affandi, L. H. (2023). Masalah guru dalam pembelajaran berbasis masalah. *Jurnal Didika Wahana Ilmiah Pendidikan Dasar, 9*(2), 209-223.

Amarullah, K., Perangin-angin, R. B. B., & Yus, A. (2025). The influence of PBL, PjBL, and critical thinking ability on learning outcomes. *Inovasi Kurikulum, 22*(2), 801-812.

Darwati, I. M., & Purana, I. M. (2021). Problem Based Learning (PBL): Suatu model pembelajaran untuk mengembangkan cara berpikir kritis peserta didik. *Widya Accarya, 12*(1), 61-69.

Davita, P. W. C., & Pujiastuti, H. (2020). Anallisis kemampuan pemecahan masalah Matematika ditinjau dari gender. *Kreano, Jurnal Matematika Kreatif-Inovatif, 11*(1), 110-117.

Farhani, N. A., Rusmawan, R., & Suyatini, M. M. (2022). Peningkatan motivasi membaca dan menulis menggunakan model pembelajaran Problem Based Learning (PBL). *Edukatif : Jurnal Ilmu Pendidikan, 4*(4), 6168-6176.

Furqanisah, F., & Arifin, Z. Evaluation of the implementation of the Kurikulum Merdeka at SMAN 14 Bandung. *Inovasi Kurikulum, 21*(4), 2061-2074.

Handayani, R. H., & Muhammadi, M. (2020). Pengaruh model pembelajaran problem based learning terhadap hasil belajar siswa dalam pembelajaran tematik terpadu di kelas V SD. *E-Journal Inovasi Pembelajaran SD, 8*(5), 78-88.

https://doi.org/10.17509/curricula.v4i2.87855

Hasana, U., Ilyas, F. F., Rosdiana, A., & Magfirah, N. (2023). Pengaruh model pembelajaran problem based learning terhadap hasil belajar Biologi. *Ardhi: Jurnal Pengabdian dalam Negri, 1*(6), 12-18.

Hasanah, R., Anam, F., & Suharti. (2023). Penerapan model pembelajaran problem based learning untuk meningkatkan hasil belajar Matematika peserta didik kelas VII B SMPN 13 Surabaya*. JMER: Journal of Mathematics Education Research, 1*(2), 1-7.

Hendra, H. (2021). Meta analisis pengaruh model pembelajaran problem based learning terhadap hasil belajar Matematika siswa kelas III, IV dan V sekolah dasar. *Mahaguru: Jurnal Pendidikan Guru Sekolah Dasar, 2*(1), 129-140.

Hermanto, I. M., Nurhayati, N., & Samatowa, L. (2022). Identifikasi profil retensi pengetahuan siswa melalui penerapan model pembelajaran Guided Context-Problem Based Learning (GC-PBL). *Normalita (Jurnal Pendidikan), 10*(2), 137-147

Hotimah, H. (2020). Penerapan metode pembelajaran problem based learning dalam meningkatkan kemampuan bercerita pada siswa sekolah dasar. *Jurnal Edukasi, 7*(3), 5-11.

Jannah, M., & Hayati, M. (2024). Pentingnya kemampuan literasi Matematika dalam pembelajaran Matematika. *Griya Journal of Mathematics Education and Application, 4*(1), 40-54.

Juraidah, J., & Hartoyo, A. (2022). Peran guru dalam menumbuhkembangkan kemandirian belajar dan kemampuan berpikir kritis siswa sekolah dasar melalui proyek penguatan profil pelajar Pancasila. *Jurnal Pendidikan Dasar Perkhasa: Jurnal Penelitian Pendidikan Dasar, 8*(2), 105-118.

Kanah, I., & Mardiani, D. (2022). Kemampuan komunikasi dan kemandirian belajar siswa melalui problem based learning dan discovery learning. *Plusminus: Jurnal Pendidikan Matematika, 2*(2), 255-264.

Khaesarani, I. R. (2021). Studi kepustakaan tentang model pembelajaran Think Pair Share (TPS) dalam meningkatkan hasil belajar Matematika siswa. *Wahana Matematika dan Sains: Jurnal Matematika, Sains, dan Pembelajarannya*, *15*(3), 37-49.

Meilasari, S., Damris M, D. M., & Yelianti, U. (2020). Kajian model pembelajaran Problem Based Learning (PBL) dalam pembelajaran di sekolah. *Bioedusains: Jurnal Pendidikan Biologi dan Sains, 3*(2), 195-207.

Mardani, N. K., Atmadja, N. B., & Suastika, I. N. (2021). Pengaruh model pembelajaran Problem Based Learning (PBL) terhadap motivasi dan hasil belajar IPS. *Jurnal Pendidikan IPS Indonesia, 5*(1), 55-65.

Nahdania, S., & Ain, S. Q. (2024). Menggali penyebab rendahnya hasil belajar Matematika di kelas V SD Negeri 001 Tanjung. *Cetta: Jurnal Ilmu Pendidikan, 7*(4), 195-205.

https://doi.org/10.17509/curricula.v4i2.87855

Novianti, C., Sadipun, B., & Balan, J. M. (2020). Pengaruh motivasi belajar terhadap hasil belajar Matematika peserta didik. *Science, and Physics Education Journal (SPEJ), 3*(2), 57-75.

Nugroho, R., & Warmi, A. (2022). Pengaruh motivasi belajar terhadap hasil belajar Matematika siswa di SMPN 2 Tirtamulya. *EduMatSains: Jurnal Pendidikan, Matematika dan Sains*, *6*(2), 407-418.

Nursanti, F., Haryaka, U., & Untu, Z. (2023). Peningkatan hasil belajar Matematika siswa melalui model problem based learning berbantuan media video animasi. *Primatika: Jurnal Pendidikan Matematika, 12*(2), 117-126.

Oktaviani, U., Kumawati, S., Apriliyani, M. N., Nugroho, H., & Susanti, E. (2020). Identifikasi faktor penyebab rendahnya hasil belajar Matematika peserta didik di SMK Negeri 1 Tonjong. *Math Locus: Jurnal Riset dan Inovasi Pendidikan Matematika, 1*(1), 1-6.

Putra, R. E. (2021). Peningkatkan hasil belajar Matematika menggunakan strategi pembelajaran berbasis masalah di sekolah dasar. *Jurnal Inovasi Pendidikan dan Teknologi Informasi (JIPTI), 2*(1), 40-51.

Rahman, A. B. P., Munandar, S. A., Fitriani, A., Karlina, Y., & Yumriani, Y. (2022). Pengertian pendidikan, ilmu pendidikan dan unsur-unsur pendidikan. *Al-Urwatul Wutsqa: Kajian Pendidikan Islam*, *2*(1), 1-8.

Rahmawati, S., & Wijaya, B. R. (2023). Pengaruh model pembelajaran Problem Based Learning (PBL) terhadap hasil belajar Matematika pada siswa kelas V UPTD SDN Gili Barat. *Jurnal Bintang Pendidikan Indonesia, 1*(4), 34-49.

Sagita, N., & Ikashaum, F. (2023). Pengaruh model pembelajaran problem based learning terhadap hasil belajar Matematika siswa. *Kognitif: Jurnal Riset HOTS Pendidikan Matematika, 3*(2), 148-157.

Sanga, L. D., & Wangdra, Y. (2023). Pendidikan adalah faktor penentu daya saing bangsa. *Prosiding Seminar Nasional Ilmu Sosial dan Teknologi (SNISTEK), 5*(1), 84-90.

Sari, R. I., Jufrida, J., Kurniawan, W., & Basuki, F. (2021). Pengembangan e-modul materi suhu dan kalor SMA kelas XI berbasis ethnophysics. *Physics and Science Education Journal (PSEJ), 1*(1), 46-59.

Tutiana, Y., Astuti, S., & Safitri, C. (2023). Pengaruh model pembelajaran coopertive tipe make a match terhadap motivasi belajar siswa pada pembelajaran Matematika kelas V. *Jurnal Elementaria Edukasia, 6*(4), 2162-2169.

Wibowo, D. C., Ocberti, L., & Gandasari, A. (2021). Studi kasus faktor-faktor yang mempengaruhi hasil belajar Matematika di SD Negeri 01 Nanga Merakai. *Jurnal Ilmiah Aquinas, 4*(1), 60-64.

https://doi.org/10.17509/curricula.v4i2.87855

Wijayanti, A., & Yanto, A. (2023). Pembelajaran Matematika menyenangkan di SD melalui permainan. *Polinomial : Jurnal Pendidikan Matematika, 2*(1), 18-23.

Winata, I. K. (2021). Konsentrasi dan motivasi belajar siswa terhadap pembelajaran online selama masa pandemi COVID-19. *Jurnal Komunikasi Pendidikan, 5*(1), 13 - 24.

Yuniar, R., Nurhasanah, A., Hakim, Z. R., & Yandari, I. A. V. (2022). Peran guru dalam pelaksanaan model PBL (Problem Based Learning) Sebagai penguatan keterampilan berpikir kritis. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 7*(2), 1134-1150.

Yustikarini, R. (2023). Discrepancy evaluation of social reconstruction-based curriculum implementation at Sekolah Rimba Indonesia. *Curricula: Journal of Curriculum Development, 2*(2), 213-232.

https://doi.org/10.17509/curricula.v4i2.87855

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https://doi.org/10.17509/curricula.v4i2.87855