Curricula: Journal of Curriculum Development *- e-ISSN 2830-7917 & p-ISSN 2964-7339*
Volume 4 No 2 (2025) 1051-1062

Curricula:
Journal of Curriculum Development
https://ejournal.upi.edu/index.php/CURRICULA/

Smart multiplication media on mathematical problem-solving skills among in Madrasah Ibtidaiyah

Amandha Fhadillah Siregar[1], Nurdiana Siregar[2]
[1,2]Universitas Islam Negeri Sumatera Utara, Kota Medan, Indonesia
amandha0306213182@uinsu.ac.id[1], nurdianasiregar@uinsu.ac.id[2]

ABSTRACT

Mathematics learning in early-grade students still faces challenges, particularly in the area of problem-solving skills, which remain relatively low. This study aims to examine the effect of using a smart multiplication board on the mathematical problem-solving abilities of early-grade students at MIN Pematangsiantar. A quantitative approach with a quasi-experimental design, specifically the pre-test and post-test control group design, was employed. The study sample consisted of 20 third-grade students, divided into two groups: an experimental class using the smart multiplication board and a control class that applied conventional teaching methods. The research instrument was a set of mathematical word problems. The findings revealed a significant difference between the performance of students in the experimental and control groups. The t-test value indicates a large effect size. This result demonstrates that the smart multiplication board significantly enhances students' mathematical problem-solving skills. Its effectiveness lies in its concrete, visual, and interactive nature, which supports logical and systematic thinking in line with children's cognitive development and Polya's problem-solving stages.

ARTICLE INFO

Article History:
Received: 20 Feb 2025
Revised: 3 Jul 2025
Accepted: 6 Jul 2025
Available online: 28 Jul 2025
Publish: 29 Dec 2025

Keywords:
Islamic elementary school; Mathematics; problem solving; smart multiplication board

Open access
Curricula: Journal of Curriculum Development is a peer-reviewed open-access journal.

ABSTRAK

Pembelajaran Matematika pada peserta didik kelas awal masih menghadapi tantangan terutama dalam kemampuan pemecahan masalah yang tergolong rendah. Penelitian ini bertujuan untuk mengetahui pengaruh penggunaan media papan pintar perkalian terhadap kemampuan pemecahan masalah Matematika peserta didik kelas awal di MIN Pematangsiantar. Metode yang digunakan adalah pendekatan kuantitatif dengan desain quasi eksperimen berbentuk pre-test and post-test control group design. Sampel penelitian 20 peserta didik kelas 3 terdiri dari dua kelas yaitu kelas eksperimen yang menggunakan media papan pintar dan kelas kontrol yang menggunakan metode pembelajaran konvensional. Instrumen penelitian berupa soal cerita Matematika. Hasil penelitian menunjukkan bahwa terdapat perbedaan yang signifikan antara hasil belajar peserta didik di kelas eksperimen dan kelas kontrol. Nilai signifikansi hasil uji t Test pada kategori tinggi menunjukkan bahwa penggunaan media papan pintar berpengaruh secara signifikan terhadap peningkatan kemampuan pemecahan masalah Matematika. Media ini terbukti efektif karena bersifat konkret, visual, dan interaktif, serta mendukung proses berpikir logis dan sistematis sesuai tahap perkembangan kognitif anak dan tahapan pemecahan masalah menurut teori Polya.

Kata Kunci: *madrasah ibtidaiyah; Matematika; papan pintar; pemecahan masalah*

How to cite (APA 7)
Siregar, A. F., & Siregar, N. (2025). Smart multiplication media on mathematical problem-solving skills among in Madrasah Ibtidaiyah. *Curricula: Journal of Curriculum Development, 4*(2), 1051-1062.

Peer review
This article has been peer-reviewed through the journal's standard double-blind peer review, where both the reviewers and authors are anonymised during review.

*Corresponding author: amandha0306213182@uinsu.ac.id

https://doi.org/10.17509/curricula.v4i2.87377

INTRODUCTION

Mathematics education serves as a vital instrument for fostering logical and systematic thinking, which are foundational skills in the development of science and technology (Darwisa & Zakaria, 2021). Despite its strategic importance, the inherently abstract nature of Mathematics often presents significant challenges in instructional delivery, particularly at the elementary school level (Ilahi et al., 2022). At this developmental stage, children are predominantly in the concrete operational phase of cognitive growth, making it difficult for them to grasp abstract mathematical concepts through traditional teaching methods (Fajari, 2021). Consequently, there is a critical need for instructional media that can bridge the gap between abstract content and students' real-world experiences, thereby enhancing conceptual understanding and learning engagement (Rakhmawati & Mustadi, 2022).

Mathematics learning essentially serves as an initial step in developing thinking skills and constructing new ideas within the domain of mathematical knowledge (Hasibuan et al., 2023). One of the essential skills that students must acquire is the ability to solve problems, which not only reflects conceptual understanding but also the capacity for logical and systematic thinking (Ananda et al., 2023). This process involves several strategic stages, including understanding the problem, devising a solution plan, implementing the plan, and evaluating the results. Thus, Mathematics instruction designed with the integration of instructional media serves not only as a means of knowledge transmission but also as a tool for cultivating critical and reflective thinking among students (Fatmaningrum & Jazuli, 2025).

Difficulties in mathematical thinking at the early stages of education persist as a significant challenge, as observed at Madrasah Ibtidaiyah Negeri (MIN) Pematang Siantar. Based on an interview with Ms. Rumiani, the homeroom teacher of class three (3) B, it was revealed that the majority of students still struggle to comprehend mathematical thinking concepts in depth. Out of 25 students, only 10 managed to exceed the Minimum Competency Criteria (KKM), indicating a considerable gap in understanding. Various factors influence this condition, both internal, such as interest, aptitude, motivation, and students' attitudes toward Mathematics, and external, including limited instructional media, lack of teaching method variation, underutilized learning modules, and inadequate facilities and infrastructure. These issues underscore the urgent need for innovation in both instructional approaches and media that can effectively bridge students' difficulties in understanding mathematical concepts and fostering mathematical thinking (Darmawati & Mustadi, 2023).

Relevant studies have shown that the use of multiplication boards as a Mathematics learning tool has led to increased student learning activity (Crismono, 2023). The implementation of multiplication board media has demonstrated a significant improvement in students' mathematical thinking skills (Baru et al., 2024). The use of multiplication board instructional media has shown positive outcomes, as evidenced by the increased average scores among second-grade elementary school students (Ananda et al., 2023). Mathematics learning mastery among second-grade elementary students also reflects an improved learning cycle when supported by the use of appropriately designed instructional modules (Chen & Cai, 2020).

https://doi.org/10.17509/curricula.v4i2.87377

The novelty of this study lies in its focus on problem-solving abilities rather than merely learning outcomes. It adopts an interactive learning approach using concrete visual media, posing the research question: Does the use of the smart multiplication board influence the mathematical problem-solving ability of early-grade students in Madrasah Ibtidaiyah (MI)? The objective of this study is to demonstrate that the multiplication board can serve as an innovative solution for enhancing the quality of Mathematics instruction, particularly in addressing the challenges of abstract learning that requires critical and logical thinking.

LITERATURE REVIEW

Multiplication Board as Instructional Media

The use of instructional media in Mathematics is essential for helping students grasp abstract concepts more concretely, particularly at the elementary education level. One such medium that can support the understanding of basic numeracy literacy is the smart multiplication board. This instructional tool serves as a visual and manipulative aid in the form of a board designed to facilitate students' comprehension of mathematical processes through active engagement in classroom activities (Rohani & Anas, 2022). The use of the multiplication board aligns with the principle that students construct knowledge through real-life experiences and direct interaction with learning objects, with the context of constructivist learning theory (Putri et al., 2023). The smart multiplication board stimulates students' cognitive activity by integrating visual and physical representations in solving mathematical word problems (Risqi & Siregar, 2023). Smart multiplication boards have been proven to improve student learning outcomes (Nafisah & Furnamasari, 2023).

Through systematic steps, such as preparing the board, selecting number cards, using straws as visual aids, and determining final results, students not only understand the multiplication conceptually but also engage in reasoning processes. This procedure includes understanding the problem context, identifying numbers within the question, manipulating objects (such as straws and pouches), and performing addition as the final stage of the multiplication operation. Consequently, this medium plays a vital role in training problem-solving skills and fostering students' conceptual understanding of multiplication. Pedagogically, instructional media such as the smart multiplication board can also enhance students' active participation, develop motor skills, and encourage systematic and reflective thinking. This makes the learning process more enjoyable and meaningful, while simultaneously helping students build a solid foundation for mathematical thinking from an early age (Panjaitan & Siregar, 2024).

Mathematical Problem-Solving Ability

Problem-solving ability is a critical component of Mathematics learning, as it reflects students' mastery of concepts as well as their capacity to apply knowledge in real-life situations. In the context of Mathematics education, problem-solving involves more than simply arriving at an answer; it encompasses the processes of understanding the situation, formulating strategies, performing calculations, and reflecting on the solutions undertaken (Siregar & Sitorus, 2021). Therefore, this ability must be nurtured from an early age, as it serves as the foundation for higher-order thinking skills essential for addressing problems beyond the classroom. Such competence is crucial, given that future life is filled with complex challenges

https://doi.org/10.17509/curricula.v4i2.87377

that require individuals to think critically and creatively in seeking solutions (Lee & Francis, 2018).

Mathematics learning requires approaches that effectively bridge abstract concepts with contextual situations in order to foster students' problem-solving skills (Arfika et al., 2025). In the absence of a clear linkage between mathematical instruction and its application in learning contexts, students are likely to face difficulties with more advanced material, which may ultimately hinder the development of their logical reasoning abilities (Clarisa et al., 2021). Therefore, Mathematics instruction must be designed to be meaningful, contextual, and problem-based. Teachers are expected to implement strategies and utilize instructional media that not only convey theoretical concepts but also provide opportunities for students to engage in cognitive processes through solving real-world problems. In doing so, Mathematics is no longer perceived as a rigid and abstract subject but rather as a tool for developing thinking skills and addressing real-life challenges (Maryam & Heryani, 2025).

Mathematics Learning in Elementary School Students

Mathematics instruction at the elementary school level, or its equivalent in Madrasah Ibtidaiyah Negeri (MIN), plays a crucial role in building a foundation for logical, systematic, and critical thinking in children. At this stage, Mathematics education aims not only to teach numerical literacy but also to develop students' ability to understand concepts and cultivate deep cognitive skills (Adelia & Musaddat, 2024). Mathematics learning in MINs is also closely linked to Islamic values, guiding students not only toward academic mastery but also toward the development of character and ethical reasoning (Imamuddin & Isnaniah, 2023). This creates a learning environment that integrates both cognitive and affective domains, making Mathematics instruction an integral part of holistic character development (Lestari et al., 2021).

The importance of Mathematics education in Madrasah Ibtidaiyah Negeri (MIN) is also closely related to the development of students' problem-solving abilities (Udmah et al., 2023). Mathematics mastery at the elementary level greatly influences students' readiness to face learning challenges at more advanced stages. Moreover, students who receive contextual and interactive Mathematics instruction tend to demonstrate stronger problem-solving abilities (Faiz et al., 2023). This indicates that Mathematics instruction designed with consideration for students' characteristics and the school environment can have a positive impact on critical thinking and problem-solving skills, which are core competencies in the 21st-century curriculum (Dilekçi & Karatay, 2023; Martinez, 2022).

METHODS

This study employed a quantitative approach using a quasi-experimental design in the form of a pre-test and post-test control group design. This design was selected to examine the effect of using the smart multiplication board on students' mathematical problem-solving abilities. The research was conducted at Madrasah Ibtidaiyah Negeri (MIN) Pematangsiantar, involving a population of 40 third-grade students. From this population, three classes were selected as samples, each consisting of 20 students, an experimental group, and a control group. The classes were selected purposively based on the consideration of initial ability

https://doi.org/10.17509/curricula.v4i2.87377

homogeneity. The experimental group received treatment through the use of the smart multiplication board during the learning process. In contrast, the control group was taught using conventional methods without the aid of media.

The data collection instrument was a problem-solving test in the form of story-based questions comprising five items. This test was administered both before (pre-test) and after (post-test) the intervention to measure changes in students' problem-solving abilities quantitatively. The data obtained from the pre-test and post-test results were analyzed using IBM SPSS version 30. A normality test was conducted using the Shapiro-Wilk method to ensure the data were normally distributed. In contrast, the Levene Test was used to assess the homogeneity of variances between groups. Subsequently, an independent sample t-test was performed to determine differences in outcomes between the experimental and control groups. This analysis aimed to test the research hypothesis that the use of a smart multiplication board has a significant effect on improving mathematical problem-solving abilities among early-grade students.

RESULTS AND DISCUSSION

Results

This study employed a quantitative method with a quasi-experimental design involving two groups: an experimental class and a control class. Data were collected through pre-tests and post-tests. Prior to instruction, students were given a pre-test to assess their initial abilities. The experimental class received instruction with the aid of the smart multiplication board, while the control class was taught using conventional methods without any media assistance. The independent variable (X) in this study was the "Smart Multiplication Board," and the dependent variable (Y) was "Problem-Solving Ability". The following section presents the statistical data derived from the analysis.

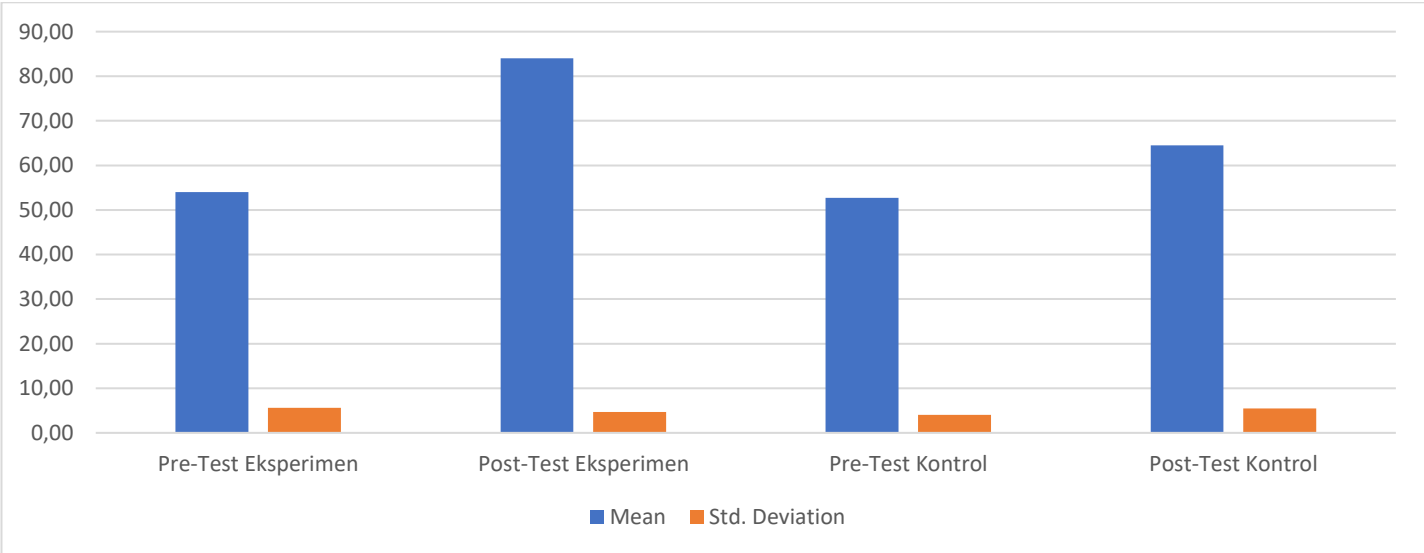

Figure 1. Bar Chart of Statistical Data Analysis Results
Source: IBM SPSS Version 30, 2025

https://doi.org/10.17509/curricula.v4i2.87377

The findings revealed an increase in average scores from the pre-test to the post-test. Notably, the experimental class showed significant improvement, with the mean score rising from 54.00 to 84.05. The control class also experienced an increase, albeit more modest, from 52.75 to 64.50 (See **Figure 1**). These results suggest that the intervention using the smart multiplication board had a positive impact on students' mathematical problem-solving skills.

Subsequently, a normality test was conducted to determine whether the research data were normally distributed. A normal distribution is a prerequisite for conducting parametric statistical analyses, such as the paired sample t-test and the independent sample t-test. According to the decision criteria for the normality test, if the significance value (sig.) is less than 0.05, the data are not normally distributed; conversely, if the significance value is greater than 0.05, the data are considered normally distributed. The table below presents the results of the normality test.

Table 1. Normality Test

	Class	Kolmogorov-Smirnov			Shapiro-Wilk		
		Statistic	df	Sig.	Statistic	df	Sig.
Problem-Solving Capabilities	Pre-Test Experiment	.112	20	.200*	.973	20	.808
	Post-Test Experiment	.157	20	.200*	.923	20	.113
	Pre-Test Kontrol	.151	20	.200*	.958	20	.495
	Post-Test Kontrol	.113	20	.200*	.967	20	.699

Source: IBM SPSS Version 30, 2025

Based on **Table 1**, the Shapiro-Wilk column indicates that the significance value for the experimental class pre-test is 0.808 > 0.05, and for the post-test, it is 0.113 > 0.05, showing that the data are typically distributed. Similarly, the control class pre-test yields a significance value of 0.495 > 0.05, and the post-test value is 0.699 > 0.05, indicating that the data in both groups are normally distributed. Following the confirmation of normal distribution, a homogeneity test was conducted to determine whether the data were homogeneous. Data are considered homogeneous when the significance value is greater than 0.05; conversely, they are considered not homogeneous when the significance value is less than 0.05.

Table 2. Homogeneity Test

		Levene Statistic	df1	df2	Sig.
Problem-Solving Capabilities	Based on Mean	.279	1	38	.600
	Based on Median	.360	1	38	.552
	Based on Median and with adjusted df	.360	1	37.219	.552
	Based on trimmed mean	.297	1	38	.589

Source: IBM SPSS Version 30, 2025

https://doi.org/10.17509/curricula.v4i2.87377

As shown in **Table 2**, the Levene's Test for Equality of Variances yielded a significance value of 0.600 (based on the mean), which is greater than 0.05. This indicates that the variances of the pre-test and post-test scores for students' problem-solving abilities are homogeneous. Since both the normality and homogeneity assumptions have been satisfied, the data meet the requirements for hypothesis testing. The hypothesis test employed in this study was the Independent Samples T-Test, which is used to determine whether there is a statistically significant difference between the means of two independent groups.

The decision criteria for the significance value are as follows: if the significance value is less than 0.05, the null hypothesis (Ho) is rejected and the alternative hypothesis (Ha) is accepted, indicating a significant difference between the two groups. Conversely, if the sig. The value is greater than 0.05; therefore, Ho is accepted and Ha is rejected, indicating no significant difference. The results of the hypothesis testing are presented as follows.

Table 3. Hypothesis Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	t	df	Significance		Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference
						One-Sided p	Two-Sided p			Lower / Upper
Problem-Solving Capabilities	Equal variances assumed	.279	.600	12.174	38	<,001	<,001	19.550	1.606	16.299 / 22.801
	Equal variances not assumed			12.174	37.129	<,001	<,001	19.550	1.606	16.297 / 22.803

Source: IBM SPSS Version 30, 2025

Based on the output in **Table 3**, the Levene's Test for Equality of Variances for the post-test data shows a significance value of 0.600, which is greater than 0.05. This indicates that the variances between the experimental and control groups are homogeneous. Therefore, the interpretation of the Independent Samples T-Test refers to the row labeled "Equal variances assumed." According to the output in the "Equal variances assumed" section, the significance value is minimal—reported as < 0.001 and rounded to 0.00—which is less than 0.05. This result leads to the rejection of the null hypothesis (Ho) and acceptance of the alternative hypothesis (Ha).

Thus, it can be concluded that there is a significant effect of using the smart multiplication board on students' mathematical problem-solving abilities between the experimental and control groups. The calculated t-value (t = 12.174) provides further support for this conclusion. This high t-value, combined with the minimal significance level, indicates that the observed difference in the mean problem-solving scores between the group using the smart multiplication board (experimental class) and the group using conventional methods (control class) is statistically significant and not due to chance. The experimental class demonstrated a substantially greater improvement in average scores compared to the control class.

https://doi.org/10.17509/curricula.v4i2.87377

Discussion

This study revealed that the use of a smart multiplication board in teaching multiplication has a significant effect on improving the mathematical problem-solving abilities of early-grade students. This is evident from the comparison between pre-test and post-test results, which showed a substantial difference between the experimental and control groups. The experimental group, which utilized the smart multiplication board, experienced an increase in the average score from 54.00 to 84.05. Meanwhile, the control group showed only a modest increase from 52.75 to 64.50. The independent samples t-test yielded a significance value of 0.000, indicating a statistically significant difference between the two groups.

The greater improvement observed in the experimental group can be attributed to the characteristics of the smart multiplication board, which is concrete, visual, and interactive (Rohani & Anas, 2022). This medium does not merely present multiplication as an abstract concept. Instead, it engages students' senses and motor skills in the learning process, for example, through activities such as placing straws into pouches based on given numbers and then calculating the results, accompanied by illustrative storytelling. This approach aligns with Piaget's theory of the concrete operational stage, which emphasizes the importance of direct learning experiences for children at the elementary level in order to grasp more abstract concepts (Lubis et al., 2024).

In contrast, the control group, which was taught using conventional instructional methods without the use of media, primarily engaged in lecture-based activities and written assignments. This approach tended to promote passive learning and limited students' motivation to explore concepts independently. The lack of interaction and physical engagement likely contributed to weaker conceptual understanding, ultimately affecting their ability to solve problems logically and systematically (Yayuk & As' ari, 2020). In addition, the effectiveness of the smart multiplication board in enhancing problem-solving ability can also be explained through Polya's theory. The problem-solving process involves four stages: understanding the problem, devising a plan, carrying out the plan, and evaluating the results (Lee & Cross Francis, 2018).

In this study, all four stages were supported through the direct use of instructional media. Students understood the problems through visualization, planned and executed solutions by arranging number cards and counting straws, and evaluated their results by comparing them to the context of the problem. This medium facilitated students' engagement in a structured and concrete problem-solving process (Panjaitan & Siregar, 2024). This study supports previous findings that using the multiplication board as a learning medium can enhance students' learning engagement (Crismono, 2023). Furthermore, it reports that the implementation of this medium had a positive impact on students' post-test scores, indicating improved problem-solving abilities. These results highlight the potential of concrete, interactive instructional media in strengthening students' conceptual understanding and fostering critical thinking skills at the elementary level (Baru et al., 2024).

https://doi.org/10.17509/curricula.v4i2.87377

This study supports previous findings that using the multiplication board as a learning medium can enhance students' learning engagement. Furthermore, it reports that the implementation of this medium had a positive impact on students' post-test scores, indicating improved problem-solving abilities. These results highlight the potential of concrete, interactive instructional media in strengthening students' conceptual understanding and fostering critical thinking skills at the elementary level (Ananda et al., 2023; Rosyiddin et al., 2023). These findings imply that integrating multiplication board media into mathematical instruction can significantly enhance students' problem-solving skills, one of the essential higher-order thinking abilities in Mathematics.

The use of the multiplication board media in early-grade Mathematics instruction serves as an effective strategy to bridge the gap between conceptual understanding and application in story problems (Rohani & Anas, 2022). Learning activities become more engaging and participatory, providing a mode of Mathematics learning that enables students to truly understand by practicing directly. Thus, this study confirms that the implementation of concrete media, such as the smart multiplication board, significantly supports the development of critical and systematic thinking skills in early-grade students, particularly in solving real-life-based mathematical problems.

CONCLUSION

The results of this study indicate that the utilization of the smart multiplication board media in Mathematics instruction significantly contributes to improving students' ability to solve problem-based questions. This approach not only facilitates students' understanding of multiplication concepts but also encourages active engagement through concrete activities aligned with their cognitive development stages. Students who participated in instruction aided by this media demonstrated greater improvement, as evidenced by a high t-value of 12.174, compared to those taught using conventional methods. Therefore, the use of the smart multiplication board has a positive impact on students' mathematical problem-solving skills and can be considered an effective alternative learning medium in early-grade classrooms. Further research is recommended to develop more creative and interactive learning media, particularly those based on animated applications, to enhance mathematical understanding among elementary school students in line with current digital learning trends.

AUTHOR'S NOTE

The author confirms that this article is written without any conflict of interest. Additionally, the author asserts that all data and content presented are original and free from plagiarism.

https://doi.org/10.17509/curricula.v4i2.87377

REFERENCES

Adelia, I., & Musaddat, S. (2024). Pengaruh media puzzle terhadap kemampuan pemecahan masalah Matematika siswa kelas III SDN 3 Ampenan. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, *9*(2), 3058-3069.

Ananda, V., Mariana, B., & Dewi, N. K. (2023). Peningkatan hasil belajar perkalian pada mata pelajaran Matematika menggunakan media papan pintar di Kelas II SDN 15 Mataram. *Jurnal Literasi dan Pembelajaran Indonesia*, *3*(2), 96-100.

Arfika, N., Fauzi, K. M. A., & Napitupulu, E. E. (2025). Development of PjBL-STEM based student worksheets to improve mathematical literacy skills. *Inovasi Kurikulum, 22*(3), 1495-1508.

Baru, N., Yulianto, A., & Fitriani, A. A. (2024). Pengaruh Media papan perkalian terhadap hasil belajar Matematika siswa kelas III SD YPK Elim Kota Sorong. *Lencana: Jurnal Inovasi Ilmu Pendidikan*, *2*(2), 16-25.

Chen, T., & Cai, J. (2020). An elementary Mathematics teacher learning to teach using problem posing: A case of the distributive property of multiplication over addition. *International Journal of Educational Research*, *102*(1), 1-14.

Clarisa, C., Rahma, F. L., Nur, F., Hasibuan, K., Khodijah, N., & Maysarah, S. (2021). Analisis kemampuan berpikir kritis mahasiswa pendidikan Matematika dalam memecahkan masalah struktur aljabar ring materi daerah integral dan field. *Farabi: Jurnal Matematika dan Pendidikan Matematika*, *4*(1), 52-60.

Crismono, P. (2023). Pengaruh penggunaan media palintarmatika terhadap meningkatkan hasil belajar siswa. *Gammath: Jurnal Ilmiah Program Studi Pendidikan Matematika*, *8*(2), 135-142.

Darmawati, Y., & Mustadi, A. (2023). The effect of problem-based learning on the critical thinking skills of elementary school students. *Jurnal Prima Edukasia*, *11*(2), 142-151.

Darwisa, A., & Zakaria, A. (2021). Urgensi penggunaan media benda konkret pada pembelajaran Matematika materi perkalian. *Al-Gurfah: Journal of Primary Education*, *2*(1), 46-59.

Dilekçi, A., & Karatay, H. (2023). The effects of the 21st century skills curriculum on the development of students' creative thinking skills. *Thinking Skills and Creativity*, *47*(1), 1-12.

Faiz, I. N., Nurhidayah, I., Sari, N. H., Jamaludin, U., & Setiawan, S. (2023). Pengaruh penggunaan media papan perkalian terhadap peningkatan hasil belajar Matematika pada siswa kelas 2 SDN Taktakan 2. *Jurnal Ilmiah Wahana Pendidikan*, *9*(18), 348-352.

Fajari, L. E. W. (2021). Critical thinking skills and their impacts on elementary school students. *Malaysian Journal of Learning and Instruction*, *18*(2), 161-187.

Fatmaningrum, U., & Jazuli, A. (2025). Augmented reality Mathematics media for enhancing critical thinking and motivation in elementary students. *Curricula: Journal of Curriculum Development*, *4*(1), 767-784.

https://doi.org/10.17509/curricula.v4i2.87377

Hasibuan, K., Lubis, M. S., & Afri, L. D. (2023). Perbedaan model reciprocal teaching dan LSQ terhadap kemampuan pemecahan masalah matematis. *Relevan: Jurnal Pendidikan Matematika*, *3*(1), 23-31.

Ilahi, K. A., Sudiana, R., & Nindiasari, H. (2022). Pengembangan media pembelajaran interaktif berbasis Wordwall untuk mengurangi kecemasan Matematika. *Wilangan: Jurnal Inovasi dan Riset Pendidikan Matematika*, *3*(4), 304-312.

Imamuddin, M., & Isnaniah, I. (2023). Peranan integrasi nilai-nilai Islam dalam pembelajaran Matematika. *Kaunia: Integration and Interconnection Islam and Science Journal*, *19*(1), 15-21.

Lee, M. Y., & Francis, D. C. (2018). Investigating the relationships among elementary teachers' perceptions of the use of students' thinking, their professional noticing skills, and their teaching practices. *The Journal of Mathematical Behavior*, *51*(1), 118-128.

Lestari, F. P., Ahmadi, F., & Rochmad, R. (2021). The Implementation of Mathematics comic through contextual teaching and learning to improve critical thinking ability and character. *European Journal of Educational Research*, *10*(1), 497-508.

Lubis, R., Rangkuti, A. R., Berutu, N. A., Wassalwa, M., Juliani, S. F., & Prastiwi, T. S. (2024). Analisis perkembangan peserta didik anak usia SD kelas 5 di Letda Sudjono Kecamatan Medan Tembung. *Fatih: Journal of Contemporary Research*, *1*(2), 151-160.

Martinez, C. (2022). Developing 21st century teaching skills: A case study of teaching and learning through project-based curriculum. *Cogent Education*, *9*(1), 1-16.

Maryam, C., & Heryani, R. (2025). Improving primary school numeracy literacy through play interventions and home-school partnerships. *Curricula: Journal of Curriculum Development*, *4*(1), 329-340.

Nafisah, S., & Furnamasari, Y. F. (2023). Penerapan media pembelajaran papan pintar dalam pembelajaran Matematika kelas dua UPTD SDN 1 Juntinyuat. *Alfihris: Jurnal Inspirasi Pendidikan*, *1*(3), 208-216.

Nasution, A. S., & Siregar, N. (2024). Pengembangan kantong bilangan penjumlahan teknik menyimpan untuk meningkatkan kemampuan pemecahan masalah peserta didik. *Jurnal Educatio: Jurnal Pendidikan Indonesia, 10*(1), 689-699.

Panjaitan, A. R. A., & Siregar, N. (2024). Pengembangan LKPD berbasis kemampuan pemecahan masalah pada materi pecahan MI/SD. *Jurnal Pendidikan Guru Madrasah Ibtidaiyah Al-Multazam*, *10*(2), 298-309.

Putri, B. A., Zamhari, A., Laily, I., Paramita, D. R., & Furwanti, E. (2023). Application of multiplication method using multiplication board to elementary school students. *Jurnal Ilmiah Pendidikan [Educational Scientific Journal]*, *2*(2), 252-257.

Rakhmawati, Y., & Mustadi, A. (2022). The circumstances of literacy numeracy skill: Between notion and fact from elementary school students. *Jurnal Prima Edukasia*, *10*(1), 9-18.

Risqi, W., & Siregar, N. (2023). Media papan pintar materi perkalian dalam pembelajaran Matematika permulaan di sekolah dasar. *Jurnal Ilmiah Pendidikan Profesi Guru*, *6*(2), 233-241.

https://doi.org/10.17509/curricula.v4i2.87377

Rohani, A., & Anas, N. (2022). Pengembangan media komik dengan menggunakan aplikasi comic page creator untuk meningkatkan kemampuan membaca siswa kelas 2 sekolah dasar. *Jurnal Cakrawala Pendas*, *8*(4), 1287-1295.

Rosyiddin, A. A. Z., Fiqih, A., Hadiapurwa, A., Nugraha, H., & Komara, D. A. (2023). The effect of interactive PowerPoint media design on student learning interests. *Edcomtech: Jurnal Kajian Teknologi Pendidikan, 8*(1), 12-24.

Siregar, A., & Sitorus, M. (2021). Pengembangan media pembelajaran Matematika dengan menggunakan Canva untuk meningkatkan motivasi belajar siswa. *Relevan: Jurnal Pendidikan Matematika*, *1*(2), 286-289.

Udmah, S., Purwaningrum, J. P., & Ermawati, D. (2024). Penggunaan media KOKUBA untuk meningkatkan kemampuan pemecahan masalah matematis siswa SD. *Jurnal Pendidikan dan Kewirausahaan*, *12*(1), 59-74.

Yayuk, E., & As' ari, A. R. (2020). Primary school students' creative thinking skills in Mathematics problem solving. *European Journal of Educational Research*, *9*(3), 1281-1295.

https://doi.org/10.17509/curricula.v4i2.87377