# Improving Students' Computational Thinking Skills Based on Minangkabau Literature

**Trinindi Eriswan Fitri[1*], Ayu Ningsih Almairus[2], Estuhono[3], Eka Filahanasari[4], Syafri Ahmad[5], Elfia Sukma[6], Alwen Bentri[7], Aisyah Anggraeni[8]**

**Elementary School Teacher Education, Universitas Dharmas Indonesia**
**Jalan Lintas Sumatera, Dharmasraya, West Sumatera, Indonesia**
[1*]*trinindi26@gmail.com*; [2]*ayu_almirus@undhari.ac.id*

**Mathematics Education, Universitas Dharmas Indonesia**
**Jalan Lintas Sumatera, Dharmasraya, West Sumatera, Indonesia**
[3]*estuhono023@gmail.com*; [4]*ekafilahanasari@undhari.ac.id*

**Primary Education, Universitas Negeri Padang**
**Jalan Prof. Dr. Hamka Air Tawar, Padang, West Sumatera, Indonesia**
[5]*syafriahmad95@yahoo.co.id*; [6]*elfiasukma@fip.unp.ac.id*; [7]*alwenbentri@fip.unp.ac.id*; [8]*aisyahrae@gmail.com*

## Abstrak

Kemampuan berpikir komputasi diperlukan untuk beradaptasi dengan kecanggihan teknologi era society 5.0. Penelitian ini bertujuan merancang pembelajaran literasi numerasi berbasis sastra Minangkabau untuk meningkatkan keterampilan berpikir komputasional siswa. Penelitian Research and Development ini berdasarkan model Plomp. Instrumen penelitian meliputi instrumen validasi dan lembar angket praktikalitas. Analisis validitas dan analisis praktikalitas menjadi bagian dari teknik analisis data. Penelitian melibatkan validator ahli materi, ahli bahasa, ahli media, dan ahli desain. Uji praktikalitas melibatkan guru dan siswa di salah satu gugus di Kabupaten Lima Puluh Kota. Penelitian ini menunjukkan hasil validasi dari desain pembelajaran yaitu 90% dengan kategori sangat valid oleh ahli bahasa, 85% valid oleh ahli materi, 90% sangat valid oleh ahli media, dan 80% valid oleh ahli desain. Rata-rata praktikalitas berdasarkan respon guru dan siswa adalah 91,73% dengan kategori sangat praktis. Penelitian ini berhasil menghasilkan desain pembelajaran literasi numerasi berbasis sastra Minangkabau yang mampu meningkatkan kemampuan berpikir komputasi siswa sekolah dasar.
Kata Kunci: Literasi; Numerasi; Sastra Minangkabau

## Abstract

Computational thinking skills are needed to adapt to the technological sophistication of the Society 5.0 era. This study aims to design numeracy literacy learning based on Minangkabau literature to improve students' computational thinking skills.. This research is Research and Development study based on the Plomp model. The research instruments consist of a validation sheet and a practicality questionnaire. The data analysis methods employed in this study were validity analysis and practicality analysis. The research involved content expert validators, linguists, media experts, and design experts. The practicality test involved teachers and students in one cluster in Lima Puluh Kota Regency. The findings of the study indicate that the validation of the learning design created is 90% with a very valid category by linguists, 85% valid by content experts, 90% very valid by media experts, and 80% valid by design experts. The average practicality based on teacher and student responses is 91.73% with very paractical category. This research successfully produced a Minangkabau literature-based numeracy literacy learning design to improve elementary school students' computational thinking skills.
Keywords: Literacy; Numeracy; Minangkabau Literature

## I. INTRODUCTION

Entering the era of society 5.0 requires various skills and expertise to adapt to technological sophistication. The 21st century requires a variety of abilities, including critical thinking, creativity, communication, and teamwork or collaboration (Duin et al., 2021; Mukhibin et al., 2024; Sukma et al., 2024). One of the skills in critical thinking that needs to be possessed is computational thinking, or the capacity for computational thought. The ability of computational thinking can be seen through the results of the Programme for International Student Assessment (PISA) organized by the Organization for Economic Cooperation and Development (OECD). As explained by Mustaqimah and Ni'mah (2024), this computational thinking ability is a new aspect assessed in PISA, or it might be said that the ability to think computationally are integrated into PISA questions.

The PISA results for Indonesia in 2022 showed a decline compared to 2018. Even this decline is considered the lowest compared to previous years (OECD, 2022; Mutiakandi & Sari, 2024). Not only has there been a decline, but Indonesia's PISA score is also still below the average score of other ASEAN countries (Ulkhaq, 2023). This issue needs special attention to be resolved.

In addition, the results of the national assessment also show that the literacy level in Indonesian elementary schools is not yet good, at 61.53%, while numeracy is still low at 46.67% (Kemdikbud, 2023). A similar problem can also be seen based on observations in one cluster of elementary schools in Lima Puluh Kota Regency.

Literacy and numeracy scores of elementary school students are relatively low.

It can be inferred from the findings of teacher observations and interviews that there are several issues occurring in the learning process. Some of these are caused by the application of teaching methods and models that are still not optimal, teachers not yet understanding the correct and proper concepts of literacy and numeracy, teachers not yet familiarizing students with literacy and numeracy questions, teachers not yet implementing local culture-based learning (Minangkabau), and teachers not yet knowing about computational thinking skills. This undoubtedly affects the low levels of literacy and numeracy among students in those elementary schools.

Ideally, elementary school education should be able to train students' literacy and numeracy skills (Siregar, Siagian, & Syahlan, 2024; Jayanti & Cesaria, 2024). One way to see this success is through the computer-based national assessment (ANBK) conducted in schools. In addition, the goals of Indonesian national education, based on UU Number 20 of 2003 concerning the National Education System, are to cultivate students' potential to become individuals who are faithful and devoted to God Almighty, have good morals, are healthy, intelligent, competent, creative, independence, and develop into responsible democratic citizens. Compared to the outcome of the national assessment conducted, it still demonstrates that the literacy and numeracy skills of elementary school students have not yet reached the minimum category (Purnomo & Sari, 2021). Additionally, PISA results also show that

Indonesia's literacy skills have declined. This indicates that there is still a gap between the expectations or goals that are desired and the results that are achieved.

To solve this issue, it is necessary to understand that can enhance students' computational thinking skills. One of the learning methods that can be applied is learning that is close to students' lives, such as local culture-based learning. Considering Indonesia's rich local culture, continuous research on local culture is necessary. Several previous studies have shown that local culture-based learning can provide contextual education, meaningful understanding, and enhance students' thinking abilities (Aini & Fathoni, 2022; Firdaus & Badriyah, 2018; Lawe et al., 2021; Lakapu et al., 2023). Previous research also indicates that using culture-based learning can improve learning outcomes, critical thinking skills, and higher-order thinking abilities in students (Lawe et al., 2021; Sari et al., 2021; Winangun, 2020; Susanti et al., 2023).

Humans need the ability to think as an important foundation in living life to achieve their goals (Ahmad et al., 2019; Ariani et al., 2020; Sukma & Sihes, 2014; Arnisya & Afriansyah, 2024). Furthermore, in the future, students will face more complex problems that require technological skills (Ahmad et al., 2022; Fitri et al., 2023; Fitria, 2018; Oktarina et al., 2023). Problem-solving skills, logical thinking, analytical, systematic, critical, and creative thinking must also be provided to students (Ahmad et al., 2017; Helsa et al., 2023; Juliharti, 2023; Putri et al., 2019). To make the right decision, to think critically and the ability to reason and think are also very much needed (Ahmad, 2022; Nasrulloh et al., 2024). This proves the importance of thinking skills for humans. The thinking ability that aligns with the current era's development is, among others, computational thinking (Islami, Fatra, & Diwidian, 2023; Nurlaelah, Usdiyana, & Fadilah, 2024). This is because computational thinking is very closely related to today's technological advancements.

Various developments to enhance computational thinking skills have been widely undertaken, one of which is through the development of e-modules (Handayani et al., 2023; Harmini & Suprihatiningsih, 2024). However, the development of literacy and numeracy learning designs based on Minangkabau literature has not yet been conducted. Therefore, this research chooses Minangkabau literature-based literacy and numeracy learning to enhance the computational thinking abilities of elementary school students.

This study focuses on the design of Minangkabau literature-based numeracy literacy learning towards students' computational thinking abilities. Compared to previous research, this study places more emphasis on Minangkabau literature-based learning, whereas previous research tended to use regional culture, which has a broader scope than regional literature. Then, the use of Book Creator, which has been frequently used by previous researchers, is based on learning models and approaches. Haven't used a local culture-based approach yet. This research uses a Minangkabau literary-based

approach to support students in elementary school to have computational thinking skills through the design of literacy and numeracy learning. Because considering that computational thinking skills are very necessary for students to face the era of society 5.0 with all its technological sophistication.

## II. METHOD

According to the Plomp model, which comprises three stages (preliminary research, prototyping, and assessment) and the type of this research is Research and Development (R&D). (Plomp & Nieveen, 2013). In preliminary research, it was involved in conducting interviews with teachers from elementary school to analyze their needs and observations. Next in the prototyping phase is designing literacy and numeracy learning based on Minangkabau literature to enhance the students' computational thinking abilities in elementary school. At this stage, literacy and numeracy learning is designed using Book Creator as engaging and enjoyable learning media for students. This is supported by previous research, which shows that the use of Book Creator is very practical, effective, and flexible for creating learning devices in elementary schools (Fitri et al., 2024).

This stage also underwent validation by experts, including content experts, language experts, media experts, and design experts. Content validation was carried out by a literature expert, Dr. Nur Azmi Alwi, S.S., M.Pd., with one revision. Language validation was then conducted by Dr. Chandra, M.Pd., with three revisions. Media validation was subsequently

performed by Dr. Melva Zainil, M.Pd., with one revision. And design validation was carried out by Dr. Ulfia Rahmi, M.Pd., with two revisions. In the final stage, small group trials and large group trials were conducted. To test the practicality of the learning design that has been developed. This research was conducted in two schools in Lima Puluh Kota Regency. One school served as the experimental class, and the other as the implementation class. This research was conducted for 1 day at the pilot school and 2 days at the implementation school. This research was conducted from November 4, 2024, to November 23, 2024.

In data analysis techniques, validity and practicality analysis will be conducted. At this stage, it certainly requires a reference that serves as the basis for determining whether an instrument is valid or invalid or can be said to be practical or impractical. As explained by Helsa (2023) based on the Table 1 and Table 2.

Table 1.
Product Validity Criteria

| Criteria | Validity Score |
|---|---|
| Very valid | 85,01%-100,00% |
| Valid | 70,01%-85,00% |
| Fairly valid | 55,01%-70,00% |
| Less valid | 37,01%-55,00% |
| Invalid | 20,00%-37,00% |

Table 2.
Product Practicality Criteria

| Category | Percentage |
|---|---|
| Very practical | 85,01%-100,00% |
| Practical | 70,01%-85,00% |
| Quite practical | 55,01%-70,00% |
| Less practical | 37,01%-55,00% |
| Impractical | 20,00%-37,00% |

## III. RESULT AND DISCUSSION

### A. Preliminary Rsearch

Teachers' observations and interviews about the primary school learning process were used to perform the preliminary research. In the learning process, students still spend a lot of time sitting in their seats, completing tasks assigned by the teacher individually, while the teacher continues to explain lessons from the front of the class, which causes boredom among students during the learning process. This perspective has been supported by studies carried out by Nofriyandi (2024), which states that students feel bored due to monotonous learning. Another issue encountered by the researcher in the process of learning is that the teacher still often asks closed-ended questions or has not yet involved the students' computational thinking skills. Furthermore, the teacher has not yet been able to provide lessons that are close to the students' lives or is still fixated on textbooks and worksheets whose content is unrelated to the daily lives of the students. In the learning process, literacy and numeracy activities have not yet been involved, and only a few students are active in the learning.

The findings of the interviews conducted with elementary school teachers can be determined that the teachers have not fully maximized the application of teaching methods or models because during classroom observations, it was seen that many students were still not active. Furthermore, The teachers still lack a thorough understanding of the fundamentals of literacy and numeracy., as

some teachers define literacy merely as reading activities and numeracy as mathematics learning, and the teachers have not yet accustomed the students to literacy and numeracy questions. Teachers cannot yet be said to implement learning that is close to students' lives based on local culture because they only teach and discuss culture in the context of Minangkabau Natural Culture lessons. What's more crucial is that the teacher is not even aware of thinking computationally, which are very important to master in this era of society 5.0.

Based on the findings of observations and according to teachers interviews, it can be said that there are several issues occurring in the learning process. This has an impact on the low literacy and numeracy of students at the elementary school. Subsequently, this issue serves as the basis for the development of literacy and numeracy learning based on Minangkabau literature at the elementary school.

It is important to understand that elementary school students today tend to engage with digital technology in various aspects (Afrilia Putri & Nanggala, 2023; Firdaus, 2021). Therefore, this research will involve technology's application in the classroom learning process. Considering that students are already accustomed to good visuals from smartphones, which often leads to boredom when learning solely from books. In addition, to address students' literacy and numeracy problems, they also need to be involved with their daily environment, which is the surrounding environment. In this study, the

environment is predominantly from the Minangkabau ethnic group. This is one of the considerations for choosing Minangkabau literature-based learning to be used in writing this learning design.

## B. Prototyping Phase

The design of literacy and numeracy learning based on Minangkabau literature in this elementary school is in the form of digital materials in teaching using Book Creator. The selected materials are picture patterns and number patterns. Next, preparations are made in terms of learning materials, worksheets, and evaluation questions. Then, the organization is carried out, encompassing the cover, the contents, and the evaluation instruments. The next stage involves creating the design of the electronic teaching materials using Book Creator. The example of the product that has been made can be seen in figure 1, 2, and 3.



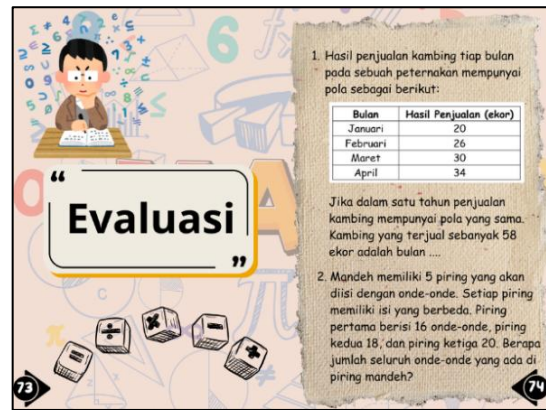Figure 1. Minangkabau literature.



Figure 2. Worksheet.



Figure 3. Evaluation question.

After completing the design phase and the product is ready, a product validation process is executed involving several experts. The validation is conducted by validators who are experts in content, language, media, and design. This aims to verify the viability of the developed product based on the experts' evaluation (Oktarina et al., 2023). The table 3 displays the findings of the validation of the developed learning design.

Table 3.
Product Validity

| Subject | Percentage | Category |
|---|---|---|
| Linguist | 90% | Very valid |
| Material expert | 85% | Valid |
| Media expert | 90% | Very valid |
| Desain expert | 80% | Valid |

Based on the product validation results that have been conducted, as shown in the table above, it was found that the teaching materials created received a validity test score of 90% by language experts with a very valid criteria. Then, a percentage of 85% by material experts with a valid criteria. The validity result by experts in media was 90% with a very valid criteria. And design experts stated a validity result of 80% with a valid criteria. These findings indicate that the Minangkabau literature-based teaching materials developed are

valid and suitable for trial with elementary school teachers and students.

Previous research also showed that after product validation, it can be used in schools. Considered previous research results, it is explained that learning in schools must keep pace with the times and technology in the process of learning, such as curriculum development, choosing the right teaching methods, using relevant learning models, and using teaching materials (Hanikah et al., 2022; Mulyani, 2019). Some problem of low student literacy skills can be overcome by implementing technology, such as developing technology-based teaching materials. According to Okratina et al. (2023), using e-modules made by Book Creator can enhance the science literacy abilities of students in elementary school. This research will also use Book Creator in developing the learning design created, but aims to enhance students' computational thinking skills through a numeracy literacy learning design. If previous research (Oktarina et al., 2023) used a STEM approach, this research uses a culture-based approach, namely Minangkabau literature. This Minangkabau literature-based approach is the most prominent difference between this research and previous studies.

## C.  Assesment Phase

After conducting product trials with teachers and students, the findings of the practicality test of the teaching materials created are showed in the Table 4.

Table 4.
Product Practicality

| Subject | Percentage | Category |
|---------|-----------|----------|
| Teacher | 92,67% | Very practical |
| Student | 90,80% | Very practical |
| Avetage | 91,73% | Very practical |

Based on the Table 4, the Minangkabau literature-based literacy and numeracy learning is categorized as very practical by teachers with a percentage of 92.67%. Similarly, the practicality test on students also shows a percentage of 90.80% with a very practical criterion. The average score of the practicality instrument is 91.73% with a very practical criterion. It can be determined that the developed electronic instructional resources are appropriate for usage in elementary schools.

The results of this study indicate that using Book Creator to develop learning designs or teaching materials is valid and practical. This aligns with previous research conducted by the researcher on the application of Book Creator in elementary school learning (Fitri et al., 2023), which stated that using Book Creator to create learning materials in elementary school is very suitable. Book Creator can assist teachers in presenting lessons and that is suitable for the Society 5.0 era.

## IV.  CONCLUSION

Literacy and numeracy learning based on Minangkabau literature for elementary school students can be concluded to be valid and practical for use. The outcome of the validation test show that in terms of language, material, media, and design, the percentages obtained were 90%, 85%, 90%, and 80% respectively. Furthermore,

the outcome of the practicality test show that the Minangkabau literature-based literacy and numeracy learning for elementary school students received a percentage of 92.67% from teachers. Meanwhile, the practicality test by students received a percentage of 90.80%. Thus, the results of this research have contributed to education, particularly in culture-based learning and the improvement of students' computational thinking skills.

However, this study only focuses on fourth-grade students in elementary school especially in mathematics lesson. This research does not yet encompass all the skills required in the 21st century, namely critical thinking, communication, creativity, and collaboration. It only focuses on critical thinking skills, specifically computational thinking. In addition, this research is also limited to using only one of the cultures in Indonesia, namely the Minangkabau culture. Therefore, the researchers recommend that future researchers explore other subjects, relate to other 21st-century skills, and utilize Indonesia's diverse cultures.

## REFERENCES

Afrilia Putri, D., & Nanggala, A. (2023). Analisis Penerapan Literasi Digital Dalam Pembelajaran Di SDN 258 Sukarela. *INNOVATIVE: Journal Of Social Science Research*, *3*(2), 3836–3848.

Ahmad, S. (2022). Integrasi Nilai Pendidikan Karakter Mulia Siswa Melalui Pembelajaran Matematika. *Jurnal Konseling Dan Pendidikan*, *10*(3), 408. https://doi.org/10.29210/191700

Ahmad, S., Kenedi, A. K., Masniladevi, Ariani, Y., & Sari, I. K. (2019). Instrument Higher Order Thinking Skill Design in Course High-Class Mathematics in Elementary School Teacher of Education Departement. *Journal of Physics: Conference Series*, *1321*(2). https://doi.org/10.1088/1742-6596/1321/2/022129

Ahmad, S., Prahmana, R. C. I., Kenedi, A. K., Helsa, Y., Arianil, Y., & Zainil, M. (2017). The Instruments of Higher Order Thinking Skills. *Journal of Physics: Conference Series*, *943*, 012053. https://doi.org/10.1088/1742-6596/943/1/012053

Ahmad, S., Zen, Z., Masniladevi, M., Kenedi, A. K., & Hendri, S. (2022). Pelatihan Peningkatan Kemampuan Technological Pedagogic Content Knowledge Guru Sekolah Dasar Pada Pembelajaran Matematika. *JPM: Jurnal Pemberdayaan Masyarakat*, *7*(2), 950–956. https://doi.org/10.21067/jpm.v7i2.7015

Aini, H. N., & Fathoni, A. (2022). Pengembangan Lembar Kerja Peserta Didik (LKPD) Matematika Berbasis Budaya Lokal Siswa Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 6167–6174. https://doi.org/10.31004/basicedu.v6i4.3191

Ariani, Y., Helsa, Y., & Ahmad, S. (2020). *Model Pembelajaran Inovatif untuk Pembelajaran Matematika di Kelas IV Sekolah Dasar*. Deepublish.

Arnisya, M. F., & Afriansyah, E. A. (2024). Unlocking Students' Creative Thinking in Mathematics: A Study on Three-

Dimensional Shapes. *Plusminus: Jurnal Pendidikan Matematika*, *4*(3), 487-502. https://doi.org/10.31980/plusminus.v4i3.2204

Duin, A. H., Pedersen, I., & Tham, J. (2021). Building Digital Literacy through Exploration and Curation of Emerging Technologies: A Networked Learning Collaborative. *Conceptualizing and Innovating Education and Work with Networked Learning*, 93–113. https://doi.org/10.54337/nlc.v12.8630

Firdaus, A. Y. (2021). Penggunaan Media MBB AR dalam Meningkatkan Kemampuan Literasi dan Karakter Siswa Slow Learner. *Jurnal Didaktika Pendidikan Dasar*, *5*(3), 781–800. https://doi.org/10.26811/didaktika.v5i3.354

Firdaus, F. M., & Badriyah, N. (2018). Penerapan Pembelajaran Tematik Berbasis Budaya Betawi untuk Meningkatkan Logical Intelligence Siswa SD Islam Taman Qur'aniyah Jakarta Selatan. *Al Ibtida: Jurnal Pendidikan Guru MI*, *5*(1), 95–106.

Fitri, T. E., Ahmad, S., Bentri, A., Sukma, E., & Helsa, Y. (2024). Learning Through the Use of Book Creator in Elementary Schools. *AIP Conference Proceedings*, *3220*(1). https://doi.org/10.1063/5.0234927

Fitri, T. E., Darmansyah, & Fitria, Y. (2023). Literature Riview: Discovery Learning pada Pembelajaran Sekolah Dasar Berbantuan TIK. *Jurnal Pendidikan Tambusai*, *7*(3), 31270–31277.

Fitria, Y. (2018). *Landasan Pembelajaran Sains Terintegrasi (Terpadu) untuk Level Dasar*. Sukabina Press.

Handayani, F., Fitria, Y., Ahmad, S., & Zen, Z. (2023). Development of E-Module based on problem Based Learning Assisted with Scratch Applications to Improve Students Computational Thinking Skills. *Jurnal Kependidikan: Jurnal Hasil Penelitian Dan Kajian Kepustakaan Di Bidang Pendidikan, Pengajaran Dan Pembelajaran*, *9*(2), 456–469.

Hanikah, H., Faiz, A., Nurhabibah, P., & Wardani, M. A. (2022). Penggunaan Media Interaktif Berbasis Ebook di Sekolah Dasar. Jurnal Basicedu, 6(4), 7352–7359. https://doi.org/10.31004/basicedu.v6i4.3503

Harmini, T., & Suprihatiningsih, S. (2024). Analysis of Mathematical Logic and Computational Thinking Abilities of Informatics Engineering Students on Learning Achievement in Calculus Courses. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(4), 909-922. https://doi.org/10.31980/mosharafa.v13i4.1787

Helsa, Y. (2023). *TPACK-based Hybrid Learning Model Design for Computational Thinking Skills Achievement in Mathematics*, *14*(2), 225–252.

Helsa, Y., Turmudi, & Juandi, D. (2023). *Computational Thinking dalam Pembelajaran Matematika*. Deepublish.

Islami, A., Fatra, M., & Diwidian, F. (2023). Model Search, Solve, Create, and Share untuk Meningkatkan Kemampuan Berpikir Komputasi Matematis Siswa Berdasarkan Self Efficacy. *Plusminus:*

*Jurnal Pendidikan Matematika*, *3*(3), 453-468. https://doi.org/10.31980/plusminus.v3i3.1508

Jayanti, R., & Cesaria, A. (2024). Pengaruh kemampuan literasi numerasi dan dukungan orang tua terhadap hasil belajar matematika soal cerita di sekolah dasar. *Jurnal Inovasi Pembelajaran Matematika: PowerMathEdu*, *3*(2), 137-148. https://doi.org/10.31980/pme.v3i2.1441

Juliharti, L. Y. F. (2023). Berpikir Tingkat Tinggi Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Bahasa, Sastra Indonesia Dan Daerah*, *13*(2), 750–759.

Kemdikbud. (2023). *Rapor Pendidikan Indonesia tahun 2023*.

Lakapu, M., Uskono, I. V., Gawa, M. G. M., & Kaluge, A. H. (2023). Buna Woven Fabric Based Teaching Materials: ADDIE Model. *Mosharafa: Jurnal Pendidikan Matematika*, *12*(3), 631-640. https://doi.org/10.31980/mosharafa.v12i3.837

Lawe, Y. U., Noge, M. D., Wede, E., & Itu, I. M. (2021). Penggunaan Bahan Ajar Elektronik Multimedia Berbasis Budaya Lokal untuk Meningkatkan Kemampuan Berpikir Tingkat Tinggi Siswa Sekolah Dasar. *Jurnal Ilmiah Pendidikan Citra Bakti*, *8*(1), 92–102.

Mukhibin, A., Herman, T., Aulia, L. S., & Firdaus, H. (2024). Integrating Computational Thinking in STEM Learning: An Effort to Improve Students' Problem-Solving Skills. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(1), 49-62.

https://doi.org/10.31980/mosharafa.v13i1.1975

Mulyani, T. (2019). Pendekatan Pembelajaran STEM untuk menghadapi Revolusi Industry 4.0. *Seminar Nasional Pascasarjana 2019 UNNES, 7*(1), 455.

Mustaqimah, U. P. S., & Ni'mah, K. (2024). Profil Kemampuan Berpikir Komputasi Siswa SMP pada Soal Tantangan Bebras. *JPMI: Jurnal Pembelajaran Matematika Inovatif*, 7(2), 297-308.

Mutiakandi, N. M., & Sari, N. M. (2024). Literasi Matematis dan Self-Confidence pada Model Problem-Based Learning. *Plusminus: Jurnal Pendidikan Matematika*, *4*(2), 369-384. https://doi.org/10.31980/plusminus.v4i2.1484

Nasrulloh, I., Ibrahim, N., & Solihatin, E. (2024). Improving Mathematical Problem-Solving Skills through the Development of Interactive *Digital Modules*. *13*(1), 17–28.

Nofriyandi, Andrian, D., Nurhalimah, S., & Loska, F. (2024). Problem Based-Learning Performance in Improving Students ' Critical Thinking , Motivation , Self-Efficacy , And Students ' Learning Interest. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(1), 259–272.

Nurlaelah, E., Usdiyana, D., & Fadilah, N. (2024). The Relationship Between Computational Thinking Ability and Logical Mathematical Intelligence. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(1), 87-96. https://doi.org/10.31980/mosharafa.v13i1.1978

OECD. (2022). *Pisa 2022 Results (Volume 1): The State of Learning and Equity in Education*. OECD Publishing.

Oktarina, R., Fitria, Y., Ahmad, S., & Zen, Z. (2023). Development of STEM-Oriented E-Modules to Improve Science Literacy Ability of Elementary School Students. *Jurnal Penelitian Pendidikan IPA*, *9*(7), 5460–5465. https://doi.org/10.29303/jppipa.v9i7.4503

Plomp, T., & Nieveen, N. (2013). *An Introduction to Educational Design Research*. Netherlands Institute for Curriculum Development (SLO).

Purnomo, B. W., & Sari, A. F. (2021). Literasi matematika siswa IPS dalam menyelesaikan soal PISA konteks saintifik. *Mosharafa: Jurnal Pendidikan Matematika*, *10*(3), 357-368. https://doi.org/10.31980/mosharafa.v10i3.668

Putri, D. K., Sulianto, J., & Azizah, M. (2019). Kemampuan Penalaran Matematis Ditinjau dari Kemampuan Pemecahan Masalah. *International Journal of Elementary Education*, *3*(3), 351–357. https://ejournal.undiksha.ac.id/index.php/IJEE

Sari, S. P., Mapuah, S., & Sunaryo, I. (2021). Pembelajaran Ilmu Pengetahuan Alam Berbasis Etnosains untuk Mengembangkan Kemampuan Berpikir Kritis Siswa Sekolah Dasar. *EduBase: Journal of Basic Education*, *2*(1), 9–18.

Siregar, R., Siagian, M. D., & Syahlan, S. (2024). Empowering Primary School Students Through Problem-Based Learning: A Path to Literacy and Numeracy Mastery. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(4), 975-988. https://doi.org/10.31980/mosharafa.v13i4.2550

Sukma, E., Ramadhan, S., & Ikhlasani, I. (2024). Elementary teachers' Perspective on Nearpod in Flipped Classrooms. *South African Journal of Childhood Education*, *14*(1), 1–10. https://doi.org/10.4102/sajce.v14i1.1472

Sukma, E., & Sihes, A. J. (2014). Kompetensi Mata Pelajaran Apresiasi Sastera Kanak-Kanak. In *International Education Postgraduate Seminar*.

Susanti, D., Retnawati, H., Arliani, E., & Irfan, L. (2023). Peluang dan tantangan pengembangan asesmen high order thinking skills dalam pembelajaran matematika di indonesia. *Jurnal Inovasi Pembelajaran Matematika: PowerMathEdu*, *2*(2), 229-242. https://doi.org/10.31980/pme.v2i2.1424

Ulkhaq, M. M. (2023). Determinan pencapaian siswa bidang matematika: Perbandingan antara indonesia dan singapura. *Jurnal Inovasi Pembelajaran Matematika: PowerMathEdu*, *2*(1), 9-16. https://doi.org/10.31980/pme.v2i1.1395

Winangun, I. M. A. (2020). Media Berbasis Budaya Lokal dalam Pembelajaran IPA SD. *Edukasi: Jurnal Pendidikan Dasar*, *1*(1), 65–72.

## AUTHOR'S BIOGRAPHY

**Trinindi Eriswan Fitri, M. Pd.**

The author is a master's student in Basic Education at Universitas Negeri Padang who completed her undergraduate education in Elementary School Teacher Education at the Faculty of Education, Universitas Negeri Padang, in 2023.

**Ayu Ningsih Almirus, M.Pd.**

Lecturer in the Elementary School Teacher Education program at the Faculty of Education and Teacher Training, Universitas Dharmas Indonesia. Bachelor's degree in Elementary School Teacher Education, Universitas Negeri Padang, graduated in 2014; Master's degree in Primary Education with a concentration in Mathematics, Universitas Negeri Padang.

**Dr. Estuhono, S.Pd., M.Pd.**

Lecturer at Universitas Dharmas Indonesia. Bachelor's degree in Physics Education, Universitas Negeri Padang, graduated as the best graduate; Master's degree in Physics Education, Universitas Negeri Padang, graduated as the best graduate; Doctor of Education, Universitas Negeri Padang, graduated with summa cum laude honors and the fastest study period of three years.

**Eka Filahanasari, M.Pd.**

Lecturer at Universitas Dharmas Indonesia. She earned a Bachelor's degree in Mathematics Education from Jambi University and a Master's degree in Mathematics Education from Muhammadiyah Malang University. Since 2018, she has been teaching in the Mathematics Education program.

**Prof. Drs. Syafri Ahmad, M. Pd., Ph.D.**

Lecturer in Elementary School Teacher Education at Universitas Negeri Padang with a concentration in Mathematics. He has published numerous articles on elementary school learning, teacher professional education, and another education-related research.

**Prof. Dra. Elfia Sukma, M.Pd., Ph.D.**

Lecturer in Elementary School Teacher Education at Universitas Negeri Padang, with a concentration in Indonesian Language and Literature. She has published numerous articles on elementary school education, literacy, Indonesian language learning in elementary schools, and another education-related research.

**Prof. Dr. Alwen Bentri, M.Pd.**

Coordinator of the Master's Program in Primary Education at Universitas Negeri Padang and an expert in the field of curriculum. He has published numerous articles on curriculum and learning, as well as another education-related research.

**Aisyah Anggraeni, M.Pd.**

Doctoral student in the Doctoral Program of Basic Education at Universitas Negeri Padang. Her academic interests include character education, Pancasila and citizenship education, and elementary education. She has published several scientific works in national journals and books, particularly in the areas of human rights, democracy, educational psychology, and civic education.