

DEVELOPMENT OF A TRADITIONAL MARKET CONTEXT-BASED E-BOOK FOR VOCATIONAL HIGH SCHOOL STUDENTS' MATHEMATICAL REASONING

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ABSTRACT

The aim of this study was to develop a traditional market context-based e-book as a digital learning resource to support mathematics learning and students' mathematical reasoning in Class X TKRO 1 at SMK Negeri 2 Padangsidempuan. This study employed a Research and Development (R&D) approach using the ADDIE development model, which consists of five stages: Analysis, Design, Development, Implementation, and Evaluation. In the Analysis stage, learning needs, curriculum requirements, student characteristics, and problems related to students' mathematical reasoning were identified through observation and literature review. In the Design stage, the e-book framework, mathematics learning materials, layout, and contextual learning activities were designed by integrating traditional market situations into mathematics learning. In the Development stage, the e-book was developed based on the designed framework and subsequently validated by two material experts and two media experts, followed by revisions based on their suggestions. In the Implementation stage, the revised e-book was implemented with 30 students of Class X TKRO 1 at SMK Negeri 2 Padangsidempuan to obtain student responses regarding its use in mathematics learning. In the Evaluation stage, formative evaluation was conducted throughout the development process, while summative evaluation was based on expert validation results and student responses to determine the feasibility of the developed e-book. The research instruments consisted of material and media expert validation questionnaires and student response questionnaires. The results showed that the e-book obtained an average material expert validation score of 87.5% and a media expert validation score of 85.0%, both categorized as very feasible. Student responses obtained an average score of 84.3%, which was also categorized as very feasible based on the criteria used in the study. These findings indicate that the developed traditional market context-based e-book meets the very feasible category and can be used as a contextual digital learning resource for mathematics learning at vocational high schools.

Keywords: E-Book, Traditional Market, Mathematical Reasoning, ADDIE, Mathematics Learning

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PRELIMINARY

Mathematics education aims to develop students' logical, critical, systematic, and analytical thinking skills (Arfika & Wardono, 2019). One essential competence is mathematical reasoning, which involves the ability to understand concepts, identify

relationships, and solve problems logically (Agustin et al., 2024; Ariati & Juandi, 2022; Tampubolon et al., 2025). However, studies indicate that students' mathematical reasoning abilities remain relatively low (Nur et al., 2023). Many students rely on routine procedures and struggle when faced with unfamiliar or contextual problems, as they tend to apply memorized rules even when inappropriate (Givvin et al., 2011; Manalu, 2021). This condition reflects a gap between expected learning outcomes and actual classroom practices (Rahma & Indriati, 2021; YUSDIANA et al., 2018).

This issue is closely related to learning practices that emphasize procedural knowledge rather than reasoning processes (Kusumaningtyas et al., 2022). As a result, students are less accustomed to explaining their thinking, making generalizations, or justifying their conclusions, which limits the development of higher-order thinking skills (Jumiarsih et al., 2020; Rifaatul et al., 2022).

Mathematical reasoning refers to the ability to draw inferences, identify relationships, make generalizations, and provide logical justifications (Hadi et al., 2025; Muslimin & Sunardi, 2019). It is distinct from mathematical thinking, which broadly encompasses cognitive processes in understanding mathematical ideas, and from problem solving, which refers to the procedural steps taken to resolve problems. In this study, mathematical reasoning is the primary focus, while problem-solving activities serve as contexts for practicing reasoning.

Traditional markets offer a relevant real-world context closely related to students' daily experiences (Effendi et al., 2026). Market activities—such as calculating total prices, determining change, comparing quantities, and analyzing discounts or ratios—naturally involve mathematical reasoning processes. These contexts enable students to identify relationships, draw conclusions, and justify their reasoning in meaningful situations (Murtini et al., 2022). The integration of such contexts into digital learning media, such as e-books, can further enhance engagement and accessibility (Maulida et al., 2024).

Previous studies have shown the potential of digital media and contextual approaches in supporting mathematical learning (Meysah et al., 2022; Putri & Siregar, 2023; Febiyani & Munahefi, 2025). However, limited research has specifically developed e-books that integrate traditional market contexts, focus on vocational high school students, and explicitly target mathematical reasoning. Most studies emphasize general learning outcomes, conceptual understanding, or creativity rather than reasoning skills.

Therefore, this study addresses this gap by developing a traditional market context-based e-book aimed at improving vocational high school students' mathematical reasoning.

The e-book presents mathematical concepts through authentic market-related activities while encouraging students to identify relationships, draw inferences, make generalizations, and provide logical justifications. This study aims to determine the feasibility, practicality, and effectiveness of the developed e-book in supporting students' mathematical reasoning through contextual learning.

METHODS

1. Research Design

The research instruments consisted of material expert and media expert validation questionnaires and a student response questionnaire. The validation instruments were developed based on theoretical and assessment criteria for mathematics teaching materials and digital learning media. The material expert validation questionnaire was designed to assess the quality and suitability of the mathematical content, including content feasibility, presentation, language, and integration of the traditional market context. The media expert validation questionnaire was designed to assess the quality of the e-book as a digital learning medium, including visual appearance, readability, navigation, and interactivity. The assessment indicators were aligned with the learning objectives and characteristics of the developed traditional market context-based e-book.

The material and media validation questionnaires used a Likert scale to assess each statement. The scores obtained from the validators were converted into percentages to determine the feasibility category of the developed e-book. The validation instruments were reviewed before use to ensure that the statements were relevant to the assessment aspects, clearly formulated, and appropriate for evaluating the developed e-book. Revisions were made based on the reviewers' suggestions before the instruments were administered to the material and media experts.

The material expert validation questionnaire covered four aspects: content feasibility, presentation, language, and contextual relevance. The media expert validation questionnaire covered four aspects: appearance, readability, navigation, and interactivity. These aspects were used to determine whether the e-book was appropriate in terms of mathematical content, presentation, language, contextual integration, visual design, readability, navigation, and digital functionality.

The student response questionnaire was administered after the implementation of the e-book. It was designed to obtain students' perceptions regarding the ease of use, attractiveness, usefulness, and motivational aspects of the developed e-book. The

responses were analyzed quantitatively using percentages and interpreted according to the feasibility criteria established in the study.

a. Analysis

In order to detect learning issues, especially the low level of students' mathematical reasoning abilities, a requirements analysis is now carried out through observation and a review of the literature (Zendrato et al., 2024). Curriculum analysis, student traits, and the requirement for relevant and interesting instructional resources are also looked at.

b. Design

This stage involves developing the e-book framework, selecting curriculum-aligned materials, and designing the layout. The learning materials integrate traditional market contexts and are equipped with examples, exercises, and activities aimed at developing specific mathematical reasoning indicators, namely: (1) drawing inferences, (2) identifying and using mathematical relationships, (3) making generalizations, and (4) providing logical justifications (Hadi et al., 2025; Muslimin & Sunardi, 2019).

These indicators are embedded in contextual tasks related to traditional market activities, such as calculating total prices and change, comparing prices and quantities, determining discounts and profits, and analyzing measurements and ratios. Each task is designed not only to produce numerical answers but also to encourage students to identify relationships, draw conclusions, generalize findings, and justify their reasoning. Thus, the e-book content is systematically aligned with the targeted mathematical reasoning indicators.

c. Development

The e-book is currently being built using the planned framework. The viability of the content, language, presentation, and design is then evaluated by material specialists and media experts utilizing validation questionnaires. Product revisions are based on the validation results (Fergiawan et al., 2025).

d. Implementation

Students in class X TKRO 1 at SMK Negeri 2 Padangsidempuan are then used to test the updated e-book in order to assess its usefulness and appeal in the context of the traditional market for mathematics education (Febiyani & Munahefi, 2025).

e. Evaluation

Both formative and summative evaluations are carried out. Summative evaluation is based on student reactions to using the e-book and expert validation results, whereas

formative evaluation is done at every level of development to enhance the product (Zakiah et al., 2025).

2. Sample

The sample in this study consists of 30 students from class X TKRO 1 at SMK Negeri 2 Padangsidempuan. In addition, this study involves:

- a. Two material expert validators, who assess the suitability of content with the curriculum, concepts, and depth of material.
- b. Two media expert validators, who assess design aspects, visual appearance, and practicality of e-book use.

3. Research Instruments

Student response surveys and validation questionnaires were the tools employed in this investigation. While the student response questionnaire is intended to ascertain the e-book's usefulness and appeal in learning, the validation questionnaire is utilized by material and media specialists to evaluate the e-book's viability (Millah et al., 2025).

a. Validation Questionnaire

Material and media specialists use this questionnaire to evaluate the e-book's viability. The grids for the media validation questionnaire and the material expert validation questionnaire are as follows (Haryati et al., 2024; Sundari & Fatonah, 2025):

Table 1. Material Expert Validation Questionnaire Grid

No	Assessed Aspect	Indicators
1	Content Feasibility	Curriculum alignment, conceptual accuracy
2	Presentation	Systematic, coherent, clear
3	Language	Easy to understand, communicative
4	Context Relevance	Integration of traditional market context

Table 2. Media Expert Validation Questionnaire Grid

No	Aspect	Indicators
1	Appearance	Attractive design, appropriate colors
2	Readability	Clear font, appropriate size
3	Navigation	Easy to use
4	Interactivity	Supports active learning

b. Student Response Questionnaire

This questionnaire is used to determine the practicality and attractiveness of the e-book. The measured aspects are as follows (Ardiantika, 2025):

Table 3. Student Response Questionnaire Grid

No	Aspect	Indicators
1	Ease of Use	Easy to understand
2	Attractiveness	Appealing appearance
3	Usefulness	Helps in understanding material
4	Motivation	Increases learning interest

4. Data Collection Techniques

Questionnaires and documentation were utilized as data gathering methods in this study (Siregar, 2025).

a. Questionnaire

Questionnaires are given to material experts and media experts to obtain validation data. In addition, questionnaires are also administered to students to determine their responses to the use of the e-book.

b. Documentation

Documentation is used to obtain supporting data during the research process. It includes photographs of learning activities using the traditional market-based e-book, expert validation results, student response sheets, and the developed e-book product display at SMK Negeri 2 Padangsidimpuan.

5. Data Analysis Techniques

a. Qualitative Data Analysis

Qualitative data are obtained from suggestions and comments of validators and student responses. These data are analyzed descriptively to improve the e-book to make it more feasible for use (Yuni et al., 2026).

b. Quantitative Data Analysis

Questionnaire data are analyzed using the percentage formula (Lestiyani et al., 2025):

$$\text{Percentage} = \frac{\text{Obtained Score}}{\text{Maximum Score}} \times 100\% \quad (1)$$

The feasibility categories are as follows (Rahmawati et al., 2026):

Table 4. Feasibility Criteria

No	Percentage	Category
1	81% – 100%	Very Feasible
2	61% – 80%	Feasible
3	41% – 60%	Fairly Feasible
4	21% – 40%	Less Feasible
5	≤ 20%	Not Feasible

c. Effectiveness Test

The findings of validation by subject matter experts, media experts, and student reactions to the e-book's use in education are used to assess its efficacy. To ascertain the degree of viability, usefulness, and appeal of the conventional market-based e-book, the data are descriptively examined using percentages.

RESULT AND DISCUSSION

Results of E-Book Development

The traditional market context-based e-book was developed systematically using the ADDIE model. The analysis stage, based on classroom observations and literature review, revealed that students' mathematical reasoning skills at SMK Negeri 2 Padangsidempuan were relatively low, particularly in solving contextual problems. Students tended to rely on routine procedures and experienced difficulties in interpreting problems, identifying relationships, and drawing logical conclusions in unfamiliar situations.

These findings indicate that existing learning resources have not adequately supported the development of mathematical reasoning, especially in connecting mathematical concepts with real-world contexts. Previous studies have shown that contextual learning materials can enhance students' understanding and reasoning by linking abstract concepts to meaningful everyday experiences (Murtini et al., 2022). In this regard, traditional market activities provide a relevant context, involving mathematical processes such as calculating prices, comparing quantities, determining discounts, and analyzing value relationships.

Based on these findings, the development of a traditional market context-based e-book was considered necessary to provide contextual learning experiences that address students' difficulties in reasoning. The e-book presents mathematical problems embedded in familiar market situations to help students identify relationships, draw inferences, and construct logical arguments.

At the design stage, the e-book framework was developed by integrating traditional market contexts into the mathematics curriculum for Class X TKRO 1. The materials include arithmetic operations, ratios, percentages, and linear relationships. These topics were contextualized through activities such as calculating total costs, determining change, comparing prices and quantities, calculating discounts and profits, and analyzing measurements of goods.

These activities were explicitly designed to develop mathematical reasoning. For example, calculating total costs and change requires identifying relevant information and drawing conclusions (drawing inferences). Comparing prices and quantities encourages recognizing mathematical relationships. Calculating discounts and profits supports applying concepts in new situations and making generalizations. Students are also required to explain their solution processes and justify their answers, promoting logical argumentation.

Each section of the e-book includes illustrations of market activities, contextual problems, and reasoning-based exercises that guide students to interpret problems, identify relationships, draw conclusions, make generalizations, and provide logical justifications. Thus, the e-book not only delivers content but also supports the development of mathematical reasoning in meaningful contexts.

The development stage resulted in an interactive digital e-book containing materials, examples, and exercises based on the traditional market context. Prior to implementation, the product was validated by material experts and media experts to ensure its feasibility in terms of content, presentation, language, and design.

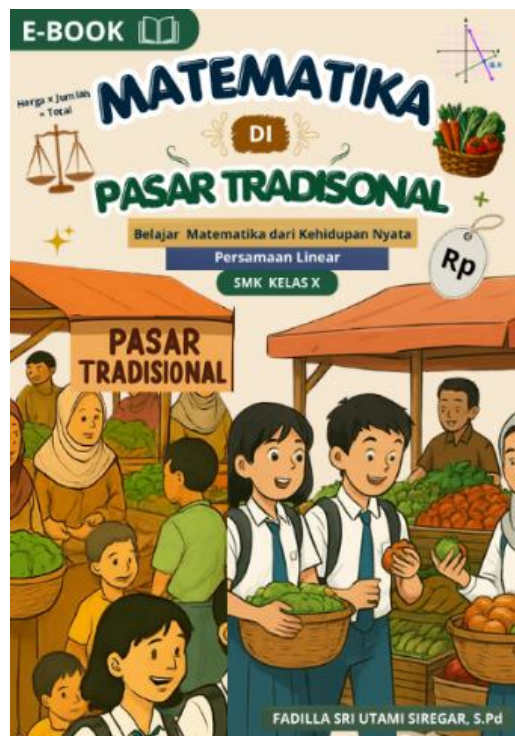


Figure 1. E-Book Cover Display

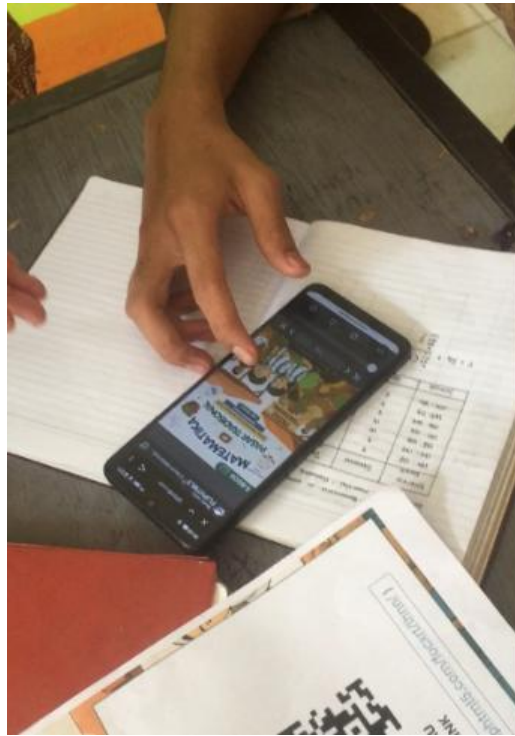


Figure 2. Implementation of E-Book Use in Class X TKRO 1 at SMK Negeri 2 Padangsidempuan

Expert Validation Results

Using previously developed validation instruments, the validation process was carried out by two material experts and two media experts. The material experts were selected based on their expertise in mathematics education, particularly in curriculum alignment and mathematics content, while the media experts were selected based on their experience in educational technology and digital learning media design. The selection of these validators was intended to ensure that both the academic quality of the content and the technical quality of the e-book were evaluated comprehensively.

The results of the material expert validation showed an average score of 87.5%, covering aspects of content feasibility, presentation, language, and contextual relevance, which is categorized as “very feasible.” The validators provided positive evaluations, particularly regarding the alignment of the material with the curriculum and the relevance of the traditional market context. They noted that the mathematical content was systematically organized, conceptually accurate, and appropriate for vocational high school students.

In addition, the validators highlighted that the integration of the traditional market context was clearly reflected in the learning materials through activities such as calculating

total prices and change, comparing prices and quantities of goods, determining discounts and profits, and analyzing measurements and quantities in buying and selling situations. These contextual activities were considered effective in connecting mathematical concepts with students' real-life experiences and supporting the development of mathematical reasoning.

Several suggestions were also provided by the validators, including improving the clarity of instructions in certain exercises, refining the wording of contextual problems, and enhancing the visual layout to increase readability. These suggestions were used as the basis for revising the e-book before it was implemented in the classroom.

Table 5. Material Expert Validation Results

Aspect	Percentage
Content Feasibility	90%
Presentation	88%
Language	85%
Context Relevance	87%
Average	87.5%

Media expert validation produced an average percentage of 85.0%, covering aspects of appearance, readability, navigation, and interactivity. This result indicates that the design and layout of the e-book fall into the “very feasible” category and meet the standards of good digital learning media. Based on the feedback from the media experts, several revisions were made to improve the quality of the e-book before implementation. First, in terms of appearance, the initial design used color combinations that were considered less consistent and less attractive. After revision, the color scheme was adjusted to be more harmonious and consistent throughout the e-book, and the layout of images and text was reorganized to improve visual balance.

Second, in terms of readability, some text sections were initially considered too dense and the font size was not optimal. After revision, the font size was adjusted, spacing between lines and paragraphs was improved, and long text sections were simplified to enhance readability. Third, in terms of navigation, the initial version of the e-book did not provide clear navigation cues between sections. After revision, clearer headings, section markers, and navigation instructions were added to help students move more easily between topics and activities. Fourth, in terms of interactivity, the initial e-book provided limited guidance for engaging with the exercises. After revision, additional instructions

and prompts were included to guide students in completing activities, particularly in reasoning-based tasks that require explanation and justification. These revisions demonstrate the improvement of the e-book from a less structured and less user-friendly format into a more visually organized, readable, and interactive digital learning resource that better supports students' learning experiences.

Table 6. Media Expert Validation Results

Aspect	Percentage
Appearance	86%
Readability	84%
Navigation	85%
Interactivity	85%
Average	85.0%

An average percentage of 84.3% was found based on the student response questionnaire. This outcome shows that students responded favorably to the created e-book, which is classified as "very feasible" for use in education.

Table 7. Student Responses

Aspect	Percentage
Ease of Use	85%
Attractiveness	84%
Usefulness	85%
Motivation	83%
Average	84.3%

Overall, the recapitulation of expert validation and student responses is presented in Table 8.

Table 8. Recapitulation of Validation and Student Responses

No	Validator	Percentage	Category
1	Material Experts	87.5%	Very Feasible
2	Media Experts	85.0%	Very Feasible
3	Student Responses	84.3%	Very Feasible

Discussion

The developed traditional market context-based e-book meets the feasibility criteria as a mathematics learning medium, as indicated by the validation results from material and media experts. The material expert validation score of 87.5% and the media expert validation score of 85.0% both fall into the “very feasible” category, indicating that the e-book is appropriate for use in the learning process. These results reflect that the e-book has fulfilled important aspects, including content feasibility, presentation, language, design, navigation, and interactivity, which support the achievement of mathematics learning objectives.

However, it is important to note that these validation results indicate the feasibility and quality of the developed product, not its effectiveness in improving students' mathematical reasoning. Previous studies, such as Putri and Siregar (2023), have shown that e-books based on real-world contexts have the potential to support students' reasoning skills and deepen their understanding of mathematical concepts. Therefore, while the present study confirms that the developed e-book is feasible and appropriate for use, further research is needed to examine its effectiveness in improving students' mathematical reasoning abilities through experimental or quasi-experimental designs.

The high percentage in the content feasibility aspect indicates that the material is aligned with the curriculum and students' needs. The integration of traditional market context helps students understand mathematical concepts through situations close to their daily lives, making learning more meaningful.

The integration of traditional market contexts into mathematics learning provides students with learning experiences closely related to their daily activities. Students can make connections between mathematical ideas and real-world scenarios by solving problems that are drawn from buying and selling activities, profit calculations, discounts, and transactions in traditional marketplaces. This supports the findings of Murtini et al. (2022), which state that contextual learning can improve conceptual understanding and students' reasoning abilities because the material becomes more relevant to their experiences.

The results of the media validation show that the e-book is visually appealing, user-friendly, and encourages autonomous learning. The use of illustrations, colors, and simple navigation helps students access the material more easily.

The generated e-book is well appreciated by students, as seen by the 84.3% of student replies in the "very feasible" category. The high response rate from students

indicates that the e-book is useful, user-friendly, and visually appealing. Students are motivated to learn mathematics by interactive displays, captivating graphics, and contextual problem presentation. This result is consistent with the findings of Maulida et al. (2024), who claim that interactive digital learning materials can improve students' motivation and involvement in the educational process.

The strong response rate from students further suggests that the e-book is useful. Because the exercises and examples are directly tied to actions in conventional marketplaces that they regularly face in their daily lives, students find it easier to learn the content. Additionally, because e-books may be accessed via digital devices at any time and from any location, they provide students with greater flexibility in their learning. This characteristic aligns with the demands of 21st-century education, which emphasizes the integration of technology to improve the quality of learning. Through the traditional market context-based e-book, students engage with real-world problems that support conceptual understanding and provide opportunities to practice mathematical reasoning in meaningful contexts.

Overall, this e-book development demonstrates a strong advantage in integrating traditional market contexts as a meaningful and contextual learning resource for students at SMK Negeri 2 Padangsidimpuan. The results reinforce the argument that mathematics learning connected to local contexts can enhance student engagement and support the development of mathematical reasoning abilities. As a result, it is very possible to use the conventional market-based e-book as a substitute teaching resource for mathematics at SMK Negeri 2 Padangsidimpuan.

CONCLUSION

This study developed a traditional market context-based e-book using the ADDIE model to support mathematics learning for vocational high school students. The findings indicate that the developed e-book meets the feasibility criteria, as reflected by material expert validation (87.5%) and media expert validation (85.0%), covering aspects of content, presentation, language, design, navigation, and interactivity. In addition, student responses show a positive level of practicality and attractiveness, with an average score of 84.3%, indicating that the e-book is user-friendly and engaging in the learning process. The integration of traditional market contexts provides a more meaningful and relevant learning experience by connecting mathematical concepts with students' everyday situations. Therefore, the e-book can serve as a viable alternative teaching resource for vocational

high school students, particularly in supporting contextual mathematics learning. However, this study is limited to product development and feasibility testing. Further research using experimental designs and standardized instruments is recommended to examine the effectiveness of the e-book in improving students' mathematical reasoning skills. Future development may also incorporate more advanced digital features and expand the integration of other local contexts to enrich students' learning experiences.

REFERENCES

- Agustin, F. S., Fauziah, N., & Khikmiah, F. (2024). Analysis of mathematical reasoning ability based on mathematics anxiety in junior high school students. *Mathline: Jurnal Matematika dan Pendidikan Matematika*, 9(2), 347–364. <https://doi.org/10.31943/mathline.v9i2.609>
- Ardiantika, A. (2025). *Pengembangan media kuis interaktif menggunakan PowerPoint untuk meningkatkan minat belajar siswa SMK produksi film*.
- Arfika, R. R., & Wardono. (2019). Peran kemampuan berpikir kritis siswa pada pembelajaran matematika dengan pemecahan masalah. *Prosiding Seminar Nasional Matematika*, 2, 439–443.
- Ariati, C., & Juandi, D. (2022). Kemampuan penalaran matematis: Systematic literature review. *LEMMA: Letters of Mathematics Education*, 8(2), 61–75.
- Effendi, A. R., Sinensis, S., & Mulyani, P. (2026). Peningkatan literasi dan numerasi anak di desa Nirwana melalui konteks kearifan lokal. *Jurnal Pengabdian Kepada Masyarakat Nusantara*.
- Febiyani, T. I., & Munahefi, D. N. (2025). Pengembangan e-book terintegrasi project-based learning bernuansa STEM untuk meningkatkan kemampuan berpikir kreatif. *Jurnal Matematika dan Ilmu Pengetahuan Alam*, 7. <https://doi.org/10.3483/trigonometri.v1i1.800>
- Fergiawan, Y. A., Santa, & Hikmah, N. (2025). Pengembangan e-book berbantuan aplikasi Book Creator pada materi norma dalam kehidupan. *Pendas: Jurnal Ilmiah Pendidikan Dasar*.
- Hadi, S., Dolk, M., Kamaliyah, & Hidayanto, T. (2025). Mathematical reasoning: How students learn mathematics? *Journal on Mathematics Education*, 16(3), 937–954. <https://doi.org/10.22342/jme.v16i3.pp937-954>
- Haryati, L., Nulhakim, L., & Andriana, E. (2024). Pengembangan media pembelajaran IPA melalui aplikasi Zepeto Kinemaster untuk meningkatkan hasil belajar siswa. *Kalam Cendekia: Jurnal Ilmiah Kependidikan*.
- Jamaluddin, M., & Nisa, R. (2026). Profil berpikir aljabar siswa SMA dalam menyelesaikan masalah ditinjau dari gaya kognitif. *Jurnal Pembelajaran Matematika Inovatif*. <https://doi.org/10.22460/jpmi.v9i1.30759>
- Jumiarsih, D. I., Kusmayadi, T. A., & Fitriana, L. (2020). Students' mathematical reasoning ability viewed from self-efficacy. *Journal of Physics: Conference Series*, 1538(1). <https://doi.org/10.1088/1742-6596/1538/1/012101>
- Kumalasari, N., Fathurohman, I., & Fakhriyah, F. (2023). Pengembangan e-modul berbasis kearifan lokal daerah Grobogan untuk meningkatkan hasil belajar siswa. *Jurnal Paedagogy*.
-

- Kusumaningtyas, N., Parta, I. N., & Susanto, H. (2022). Kemampuan penalaran matematis siswa dalam memecahkan masalah matematika. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(1), 107–119.
- Lessing, M. J., & Ogbonnaya, U. I. (2026). Reasoning and proof in mathematics education: A systematic literature review. *Discover Education*, 5(1). <https://doi.org/10.1007/s44217-025-01016-1>
- Manalu, M. (2021). Peningkatan kemampuan pemecahan masalah matematik siswa SMA melalui strategi REACT. *Cartesius: Jurnal Pendidikan Matematika*.
- Maulida, Q., Rosyida, Z. L., Jariyah, I. A., & Surabaya, U. S. (2024). Tinjauan literatur terhadap media pembelajaran berbasis e-book interaktif. *Jurnal Pendidikan dan Kebudayaan*, 1(2).
- Meysah, R. P., Lusiana, & Kesumawati, N. (2022). Problem-based learning and self-regulated learning: Impact on mathematical reasoning ability. *Desimal: Jurnal Matematika*, 5, 235–246. <https://doi.org/10.24042/djm>
- Millah, H. N., Zakaria, P., & Pauweni, K. A. Y. (2025). Pengembangan bahan ajar berbasis e-book interaktif pada materi Pythagoras. *Research in the Mathematical and Natural Sciences*, 4(1), 47–51. <https://doi.org/10.55657/rmns.v4i1.194>
- Mundanti, S. A., Ramadianti, W., & Jumri, R. (2023). Efektivitas penggunaan soal penalaran matematis pada model NHT. *Jurnal Penelitian Pembelajaran Matematika Sekolah*, 7(3), 363–370. <https://doi.org/10.33369/jp2ms.7.3.363-370>
- Murtini, S., Sumarmi, Utomo, D. H., & Astina, I. K. (2022). The effectiveness of contextual teaching and learning approach. *Hong Kong Journal of Social Sciences*.
- Muslimin, M., & Sunardi, S. (2019). Analisis kemampuan penalaran matematika siswa SMA. *Kreano: Jurnal Matematika Kreatif-Inovatif*, 10(2), 171–178. <https://doi.org/10.15294/kreano.v10i2.18323>
- Putri, A. A., & Siregar, N. (2023). Pengembangan e-book menggunakan Canva untuk meningkatkan penalaran matematis siswa. *Cartesius: Jurnal Pendidikan Matematika*, 6(2), 114.
- Rahma, A. F., & Indriati, D. (2021). Mathematical reasoning abilities of students in solving contextual problems. *International Journal of Science and Society*, 3(1).
- Yuni, S. T., Razilu, Z., & Fajriani, A. (2026). Pengembangan e-book berbasis project-based learning. *Jurnal Pendidikan dan Pembelajaran Indonesia*, 6(1), 217–227. <https://doi.org/10.53299/jppi.v6i1.3060>
- Zendrato, P. S., Mendrofa, N. K., Zega, Y., & Telaumbanua, Y. N. (2024). Analisis kemampuan penalaran matematis siswa dengan model pembelajaran berbasis masalah. *Ideguru: Jurnal Karya Ilmiah Guru*, 10(1), 86–92. <https://doi.org/10.51169/ideguru.v10i1.1472>
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