Prima: Jurnal Pendidikan Matematika
Vol. 9, No. 1, January 2025, pp. 1-15
P-ISSN: 2579-9827, E-ISSN: 2580-2216
Web: http://jurnal.umt.ac.id/index.php/prima

DEVELOPMENT OF PBL-BASED FLIPBOOK TEACHING MATERIALS WITH SOUTHEAST ACEH CULTURAL NUANCES TO IMPROVE PROBLEM SOLVING AND CRITICAL THINKING SKILLS OF SMPN 4 LAWE SIGALA-GALA STUDENTS

Meutia Silvi[1], Dian Armanto[2], Yulita Molliq Rangkuti[3]
[1,2,3]Universitas Medan, Medan, Kota Medan
e-mail: meutiasilvi1999@gmail.com,

Abstract

The objectives of this study are: 1) To improve students' problem-solving skills through PBL-based flipbook teaching materials with a Southeast Aceh cultural nuance that were developed; 2) To improve students' critical thinking skills through similar teaching materials; 3) To determine the reliability, usefulness, and efficacy of PBL-based flipbook teaching materials with a cultural nuance that were created to help students become more skilled in solving problems and thinking critically; This study is a development research that combines PBL-based learning with the ADDIE development paradigm. Based on the output of the field trial, the following results were obtained: 1) Increased problem-solving skills through PBL-based flipbook teaching materials with a Southeast Aceh cultural nuance, as evidenced by the N-gain value of the field trial of 0.70 which is included in the "moderate" category; 2) Increased critical thinking skills through PBL-based flipbook teaching materials with a Southeast Aceh cultural nuance, as evidenced by the N-gain value of the field trial of 0.67 which is included in the "moderate" category; and 3) Javanese culture-based flipbook teaching materials have been successfully developed to improve students' understanding of mathematical concepts and learning motivation, and have met the requirements of being valid, useful, and effective.

Keywords: Teaching Material Development, Flipbook, PBL, Southeast Aceh Culture, Problem Solving Skills, Critical Thinking Skills.

Abstrak

Tujuan penelitian ini adalah: 1) Meningkatkan kemampuan pemecahan masalah siswa melalui bahan ajar flipbook berbasis PBL bernuansa budaya Aceh Tenggara yang dikembangkan; 2) Meningkatkan kemampuan berpikir kritis siswa melalui bahan ajar sejenis; 3) Mengetahui reliabilitas, kegunaan, dan kemanjuran bahan ajar flipbook berbasis PBL bernuansa budaya yang diciptakan untuk membantu siswa lebih terampil dalam memecahkan masalah dan berpikir kritis; Penelitian ini merupakan penelitian pengembangan yang memadukan pembelajaran berbasis PBL dengan paradigma pengembangan ADDIE. Berdasarkan luaran uji coba lapangan, diperoleh hasil sebagai berikut: 1) Meningkatnya kemampuan pemecahan masalah melalui bahan ajar flipbook berbasis PBL bernuansa budaya Aceh Tenggara, dibuktikan dengan nilai N-gain uji coba lapangan sebesar 0,70 yang termasuk dalam kategori “sedang”; 2) Peningkatan kemampuan berpikir kritis melalui bahan ajar flipbook berbasis PBL bernuansa budaya Aceh Tenggara, terbukti dari nilai N-gain uji coba lapangan sebesar 0,67 yang termasuk dalam kategori “sedang”; dan 3) Telah berhasil dikembangkan bahan ajar flipbook berbasis budaya Jawa untuk meningkatkan pemahaman konsep matematika dan motivasi belajar siswa, serta telah memenuhi syarat valid, bermanfaat, dan efektif..

Kata kunci: Pengembangan Bahan Ajar, Flipbook, PBL, Budaya Aceh Tenggara, Kemampuan Pemecahan Masalah, Kemampuan Berpikir Kritis.

INTRODUTION

According to the National Council of Teachers of Mathematics (2000), the general goals of mathematics education are to ensure that mathematics students understand and perform well in mathematics concepts, apply mathematical techniques to solve problems,

Received: October 28, 2024; Revised: December 15, 2025; Accepted: January 19, 2025

communicate their understanding of mathematics clearly, and relate mathematics to other subjects, real-world situations, and global contexts.

In order to enhance the quality of mathematics education, it is essential for students to have strong mathematical abilities, which encompass problem-solving skills and critical thinking. Every student should possess problem-solving and critical thinking skills to facilitate their comprehension of mathematical concepts. In the field of education, students' capabilities are honed through problem-solving exercises, enabling them to enhance their diverse skill set. The ability to solve problems is considered fundamental to the study of mathematics and is essentially the primary objective of the educational process (Dahar, 2011).

In order to enhance the quality of mathematics education, students need to have strong mathematical abilities, which include problem-solving skills and critical thinking skills. Every student should possess problem-solving skills and critical thinking skills to facilitate their comprehension of mathematical concepts. In the field of education, students' competencies are developed through tackling problems, which enables them to enhance their overall abilities. The ability to solve problems is considered fundamental in the study of mathematics and is the primary objective of the educational process (Dahar, 2011):

Table 1. Number of Students Passing the Minimum Completion Criteria (KKM)

No	KKM Score Category	Score Interval	Number of Students	Percentage of Pass
1	High	>70	16 Students	22,22% (Pass)
2	Simply	70	8 Students	11,11% (Pass)
3	Low	<70	48 Students	66,67% (Not Passed)

Several of the 72 pupils who took the initial observation test were still classified as deficient in their ability to respond to questions about their critical thinking and problem-solving abilities. In order to enhance students' problem-solving abilities, researchers believe it is necessary to create teaching materials that incorporate the subtleties of North Sumatra special foods and problem-based learning, supported by Flipbooks.

This demonstrates that students are less engaged and enthusiastic about learning mathematics since they are unable to fully comprehend mathematical problems and apply their problem-solving abilities to solve them. The author hopes to create instructional materials using a problem-based learning approach and subtleties of ethnomatics based on

the aforementioned issues. A flipbook is a type of digital teaching resource that resembles a printed book and can be enhanced with text, animation, video, sound, and other elements.

PBL, or problem-based learning, is a method in which students actively complete assignments or projects that call for complex problem solving. When it comes to PBL-based math teaching materials, students are taught through problems that give them a real-world context. PBL, according to experts in mathematics education, enables students to gain a deeper comprehension of mathematical ideas by putting them to use in authentic contexts. Mathematical teaching materials that use a PBL approach may include problems that test students' ability to solve problems, recognize patterns, or apply mathematical ideas to real-world situations.

Given that Indonesia is a country with cultural diversity, it would be beneficial to incorporate cultural specificities into the development of teaching materials using a problem-based learning approach. This would help students become more familiar with mathematics and Indonesian culture, especially the Aceh Alas tribe in the southeast, and would improve their ability to solve mathematical problems and think critically about mathematics.

The researcher chose a solution to be studied with the title "Development of PBL-Based Flipbook Teaching Materials with Southeast Aceh Cultural Nuances to Improve Problem Solving and Critical Thinking Skills of Students at SMPN 4 Lawe Siga-gala" considering the problem.

METHODS

Research and development, also known as R&D, is a type of research that needs to be done. The final product is a flipbook for grade VIII students of SMPN 4 Lawe Sigala-gala covering the System of Linear Equations in Two Variables. The final product is a learning flipbook for grade VIII students of SMPN 4 Lawe Sigala-gala covering the System of Linear Equations in Two Variables.

Class VIII of SMPN 4 Lawe Sigala-gala, located at Jalan Lawe Desky-Salim Pipit No. 31 Pardomuan Dua, Babul Makmur District, Southeast Aceh Regency, Aceh Province, will be the location of this research, which is planned to be carried out in March to April 2024, even semester of the 2023/2024 academic year.

The research sample was students of Class VIII-1 and Class VIII-2 totaling 72 students, while the population was all students of SMPN 4 Lawe Sigala-gala in the 2023/2024 academic year totaling 219 students.

There are various steps taken by researchers in conducting this research to create products that will be used in the future.

1. At the need assessment stage, a needs analysis is carried out to develop learning products. Creating an initial concept for learning products that is tailored to the needs and conditions of the target is the most important aspect at this stage.
2. The design stage is the next stage. Choosing a digital message delivery strategy is the most important step in this process. At the design stage, the following tasks are carried out: a) choosing material (theme); b) determining the type of digital content to be produced; and c) writing scripts for digital content using information processing theory.
3. Various efforts are made to transform the design into a physical form in order to build a digital content prototype of the development product during the development and implementation period. The digital content prototype is the result of all the work done during the design phase, including material selection, learning strategy selection, and teaching material design. After development, the digital content will move to the implementation phase, where it will be tested on the intended audience (students) and verified by experts. The purpose of validation and testing is to collect feedback on how to improve the remaining deficiencies in the teaching materials. Each stage of development is evaluated and revised. To determine the priority scale of the problems identified in the field, the findings of the needs analysis are assessed at the needs analysis stage. The framework or script is evaluated during the design phase, and necessary script modifications are then made. Experts assess the digital content during the development and implementation phases, and changes are made in response to their suggestions.

RESULTS AND DISCUSSION

This sub-chapter describes the steps of development research that have been carried out using the ADDIE model (analysis, design, development, implementation, and evaluation). The following explanation shows the findings of this study.

Four topics—curriculum, instructional resources, and classroom conditions for students—were analyzed. The findings of each analysis are listed below.

The 2013 curriculum is the curriculum used in schools, based on the results of interviews with the principal of SMPN 4 Lawe Sigala-gala. In addition, the researcher also reviewed the material for semester 2 of class VIII, namely the System of Linear Equations of Two Variables. The following are the core competencies (KI) of knowledge and skills for the Pythagorean theorem material, as determined in the assessment of the 2013 curriculum.

1. Understanding and using knowledge (factual, conceptual, and procedural) based on interests in science, technology, and art in relation to observable phenomena and events is the third core competency (knowledge).
2. Core competency 4 (skills): Using, analyzing, composing, changing and producing in the concrete realm as well as writing, reading, calculating, drawing and composing in the abstract realm in accordance with what is taught at school and other sources that are commensurate in point of view and theory.

On March 20, 2024, eighth grade students at SMPN 4 Lawe Sigala-gala took a test administered by the researcher to assess their critical thinking and problem-solving skills. The purpose of the test was to assess how well students had developed their critical thinking and problem-solving skills after using the textbooks provided by the school. Students' critical thinking and problem-solving skills were generally in the poor range, according to the findings of the numeracy and critical thinking problem-solving assessments. However, students in the high and very high score groups either received no points or no points at all. All students had an average score of 31.73, which was in the lowest range. According to the ability test results, 35% of students were in the moderate group, 47% were in the low category, and 18% were in the very low category. However, students in the high and very high score groups received no points or no points at all. All students had an average score of 33.18, which was in the poor range.

Introduction, text content, and problem questions are the three main components of the flipbook learning material creation process (Millah et al, 2012). The front cover, introduction to PBL, learning objectives, learning rules (use of the book), introduction to figures and culture, book content (including stories, materials, pictures, problems, solutions, and exercises), bibliography, author biography, and back cover comprise the ten components of the learning material framework design adapted for this study. As seen in Figure 1 below, this learning material framework design is displayed as a module structure.

Figure 1. Framework Design of Teaching Materials

Along with the aforementioned information, the font type and size utilized also affect how the book is designed. Times New Roman is the font type selected, and the font sizes range from 14 to 20. The font size and type are clean, easy to read, and require less pages. Additionally, Ms. Word's equation menu is used in the creation of this instructional resource to write numbers and mathematical symbols. The goal of using the equation menu is to write numbers and mathematical symbols in a concise and organized manner. 3) Media design that is pertinent Paint, Canva, Heyzine Flipbook, and Ms. Word are all pertinent media for the creation of this book. Story scripts and illustrations are created using Ms. Word and Paint.

Canva and Heyzine Flipbook are mostly used for digital publications that mimic the look and feel of a real book, so users can flip through the pages just like they would a printed book.

From January 2023 to June 2024, flipbook teaching materials were developed. The development of flipbook teaching materials involves the relationship of topics with the culture of Southeast Aceh and the mathematical content in the study, especially the content of the two-variable linear system. The development of flipbook teaching materials was carried out according to the design made. The results of the book development are described below and are available at this link: https://heyzine.com/flip-book/32244c12aa.html.

There is a front cover at the beginning of the flipbook instructional material. The title of the flipbook instructional material, which includes culturally sensitive illustrations and a PBL-based two-variable linear equation system, is printed on the front cover. The front cover of the book resembles Figure 2.

Figure 2. The front cover of the book

Figure 3 illustrates the five sections that make up the learning objectives in this instructional resource.

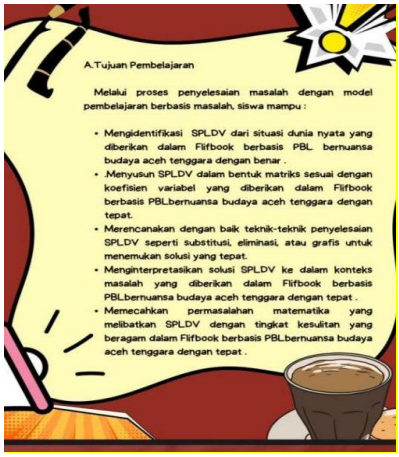

Figure 3. The learning objectives

The introduction is shown in Figure 4 in the next section.

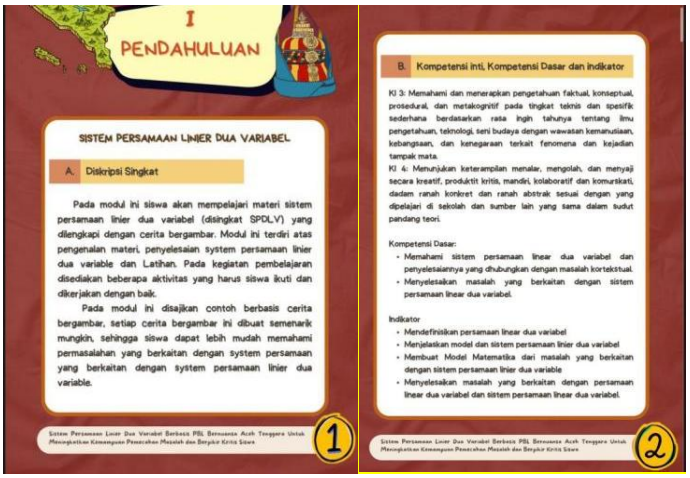

Figure 4. The The Introduction

This flipbook teaching material's content was created with the following principles and traits in mind: 1) Learning starts with real-world problems; 2) Problems are chosen based on learning objectives; 3) Students solve problems through real-world investigations; and 4) Students work together to solve problems. Figure 5 below displays the learning activities area of this Flifbook teaching resource.

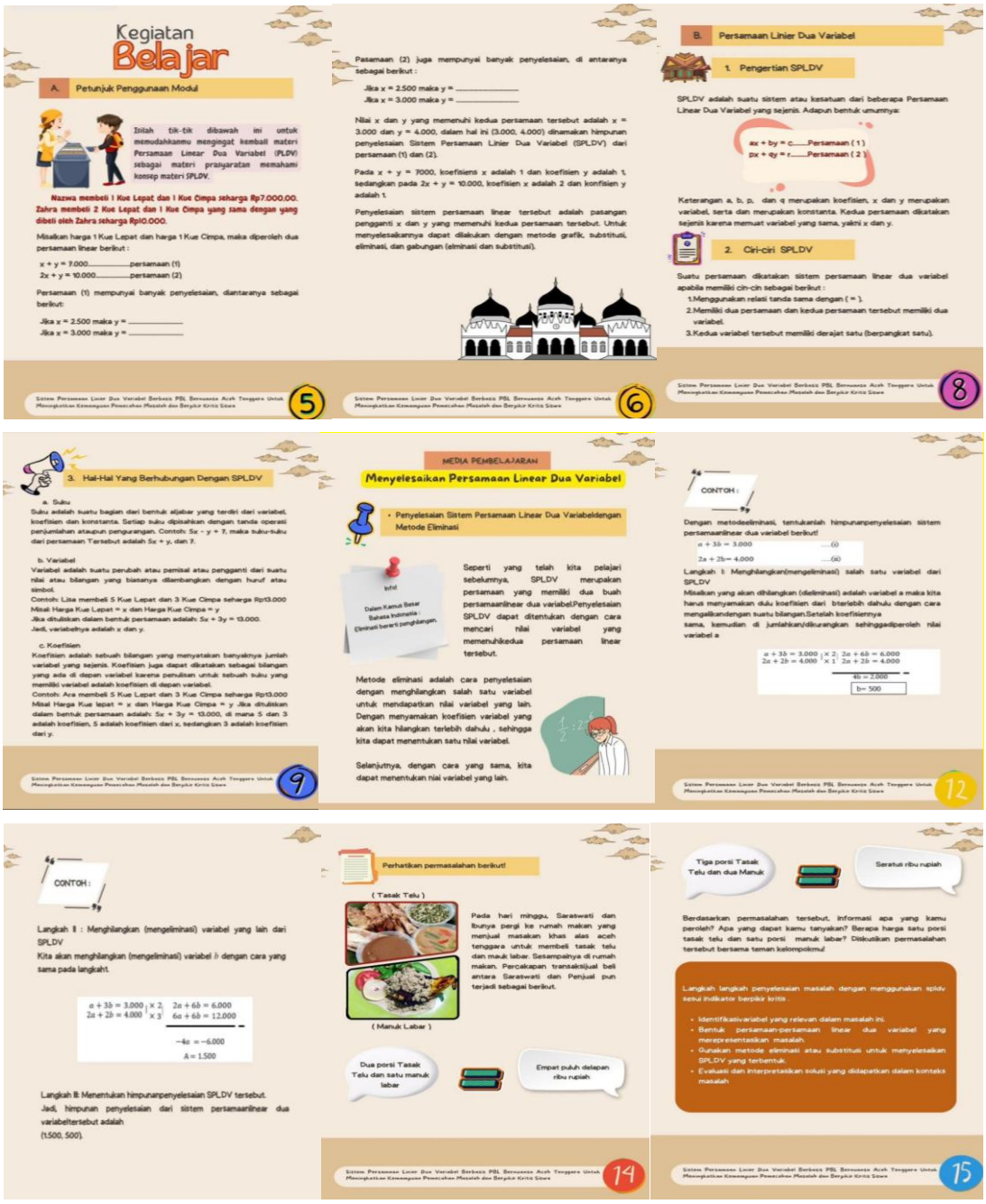

Figure 5. The content part of this flipbook

The teaching materials contain a total of twelve original problems, six of which are designed to improve problem-solving skills and six of which are designed to improve critical thinking skills when dealing with real-world situations involving a two-variable linear equation system with cultural intricacies from Southeast Aceh. Figure 6 below provides a description of the problems in the teaching materials.

Figure 6. The description of the problems in the teaching materials

The following describes the results of the study in the form of student responses, n-gain results, t-test results, study time, characteristics of learning objective achievement, and classical completeness. Based on the concept of classical completeness, which requires 85% of students in the class to have mastered the KKM value of 70 set in the school. The results of the study showed that classical completeness had reached 86.66%, with 26 students having achieved the KKM value and 4 students having not achieved the KKM value. These results indicate that the teaching materials created have met the requirements for classical

completeness. These results indicate that the teaching materials produced have met the requirements for success in meeting the characteristics of classical completeness.

Three face-to-face interactions with students were used to conduct the study during the learning period. In order to build rapport with students and provide the learning model used for the study, the first meeting served as an introductory session. In an effort to optimize the learning process while conducting the study, it is very important for researchers to achieve this. Some elements are unavoidable, such as the need for adjustment time when learning with a new instructor and a new learning model, especially if the researcher has never met the students or used the PBL learning paradigm. The learning process was placed in the next two meetings, so that the total duration of the class learning was 4 × 40 minutes. The amount of time allocated by the instructor to study the content of the System of Linear Equations in Two Variables can be adjusted during the learning period.

according to the n-gain score, which tries to evaluate the results of the increase in value after therapy. With an n-gain score of 0.70, the increase in students' problem-solving abilities after learning treatment is in the moderate category, as is the increase in students' critical thinking abilities after learning treatment, with an n-gain score of 0.67. Thus, it can be concluded that the use of flipbook teaching materials helps students' critical thinking and problem-solving abilities to a reasonable level.

From the description above, it can be seen that the flipbook teaching material has succeeded in increasing the KKM achievement by 86.66%. Viewed from the length of time of learning implementation. Regarding the effectiveness of the treatment in improving problem-solving and critical thinking skills, as shown by the N-gain results, the increase in problem-solving skills after the learning treatment is in the moderate category with an n-gain value of 0.70, while the increase in students' critical thinking skills after the learning treatment is in the moderate category with an n-gain value of 0.67. In addition, the flipbook teaching media has a significant influence on students' critical thinking and problem-solving skills, based on the results of the t-test with a significance level of 0.000 <0.05 for critical thinking skills and 0.001 <0.05 for problem-solving skills.

CONCLUSION

Based on the results of the analysis and discussion of this research, several conclusions can be drawn as follows:

1. The local culture-based flipbook teaching materials produced are categorized as valid and reliable. The valid and reliable categories include research tools in the form of Critical Thinking Ability Tests (initial and final tests) and Problem Solving Ability Tests.
2. Based on the results of the analysis of the results of observations of the implementation of learning, the local culture-based flipbook teaching materials have met the requirements of practicality.
3. Based on the normalized gain index, it is known that the ability to understand mathematical ideas has increased. Thus, it can be said that local culture-based flipbook teaching materials can improve students' critical thinking and problem-solving skills.
4. The student learning motivation questionnaire score increased after using the flipbook teaching materials, based on the results of the learning motivation assessment before and after. Thus, it can be said that local culture-based flipbook teaching materials can increase students' enthusiasm for learning.
5. Significant results were obtained based on the following factors: student response, learning time, n-gain results, t-test results, classical completeness characteristics, and aspects of achieving learning objectives. Thus, it can be said that local culture-based flipbook learning resources have met the requirements for effectiveness.

ACKNOWLEDGMENTS

Because there are so many distinct disciplines of research, reviewers are crucial to the editors' assessment of papers submitted for publication. I am grateful to several colleagues, both domestically and overseas, for their kind, supportive, and frequently prompt answers to my requests for their thoughts and advice. The Journal was not permitted to properly thank anyone who assisted in this way until recently. But this little statement will let them know that their help is much valued. Together with my helpful coworkers on the Journal's staff, they have significantly lessened the amount of work I have to do in my role as editor.

REFERENCES

Colliver, J.A. 2000. Effectiveness Of Problem-Based Learning Curricular ResearchAnd Theory. Academic Medicine, Vol 7 (5);259–266.Ernest R. Hilgard . l984. Psikologi Pendidikan. Raja Grafindo Persada. Jakarta.

D'Ambrosio, U. 1985. Ethnomathematics and Its Place in the History and Pedagogy of Mathematics. For the Learning of Mathematics: Vol. 5 No. 1.

Dayu, D.P.K., Anggrasari, L.A. Flipbook Story to Increase Reading Skills For Beginners. Prosiding Seminar Internasional Bahasa dan Sastra Daerah I,

European regions using free word association. Food Quality and Preference,21(2), 225–233.

Ennis, R. H. (2011), The Nature of Critical Thinking: An Outline of Critical Thinking Dispostions and Abilities, Universitas of lllinois.

Faiser Alec, (2008), Berpikir Kritis, Jakarta: Erlangga.

Fasha, dkk, (2018), "Peningkatan Kemampuan Pemecahan masalah Berpikir Kritis Matematis Siswa Melalui Pendekatan Metakognitif," Jurnal Didaktik Matematika, Vol. 5, No. 2.

Fauziah, Anna, (2010), Peningkatan Kemampuan Pemahaman dan Pemecahan Masalah Matematika Siswa SMP Melalui Strategi REACT, Forum Kependidikan Fakultas Keguruan dan Ilmu Pendidikan Universitas Sriwijaya Palembang.

Fatade, Alfred Olufemi. 2013. Effect Of PBL. On Senior Second Students'Achivement I Futher Mathematics. Acta Didactica Napocensia. 6 (3); 28-44

Greer, B., Mukhopadhyay, S., Powell, A.B., Barber, S.N. 2009. Culturally Responsive Mathematics Education. UK: Taylor & Francis e-Library.

Guerrero, L., Claret, A., Verbeke, W., Enderli, G., Zakowska-Biesmans, S., Vanhonacker, F., Issanchou, S., Sajdakowska, M., Granli, B. S., Scalvedi, L.,Contel, M., & Hersleth, M. (2010). Perception of traditional food products in six

Hartono Yusuf, (2014), Matematika Strategi Pemecahan Masalah, Yogyakarta: Graha Ilmu.

Hasanah & Surya, (2017), Differences in the Abilities of Creative Thinking and Problem Solving of Students in Mathematics by Using Cooperative Learning and Learning of Problem Solving, International Journal of Sciences: Basic and Applied Research (IJSBAR), Vol. 34. No. 1, pp 286-229

Hendriana Heris dan Soemarno, (2016), Penilaian Pembelajaran Matematika, Bandung: PT Refika Aditama.

James, A.T., Akaazua., Tertsea, J. 2021. The Effect of Ethnomathematics on Junior Secondary School Students' Achievement and Retention in Geometry in Benue State, Nigeria: A Corona Virus Pandemic Case Study. IJRIAS: Vol. VI Issue IV.

Karim & Normaya, (2015), Kemampuan berpikir Kritis Siswa dalam Pembelajaran Matematika dengan Menggunakan Model Jucama di Sekolah Menengah Pertama, Jurnal Pendidikan Matematika, No.3.

Kemenparekraf. (2022). Produk Wisata Alame/dodol

Khotimah, H. 2021. Penggunaan Bahan Ajar Komik digital: Pembelajaran Mandiri dalam Jaringan untuk Anak Sekolah Dasar. Malang: Literasi Nusantara.

Maghfirothi, N.L., Mitarlis, Widodo, W. 2013. Pengembangan Flip Book IPA Terpadu Bilingual Dengan Tema Minuman Berkarbonasi Untuk Kelas VIII SMP. e-Pensa: Vol. 1 No.3.

Manivannan, S., & Balasubramanian, S. 2010. Animation in J2EE Project-An Overview. IJGM: Vol. 1 No.1.

Matondang, I. A. (2013). Udan Potir: Simbolik Ekologis Gordang Sambilan Dan Lingkungan Alam. Lakon : Jurnal Kajian Sastra Dan Budaya, 1(2), 34–48.

Nasruddin, Sari, D.M.M., Makruf, S.A., Darmawan, I.P.A., Herman, Jumiyati, S., … Purwanto, H. 2022. Pengembangan Bahan Ajar. Padang: Global Eksekutif Teknologi.

Nasryah, C.E., & Rahman, A.A. 2020. Ethnomathematics (Matematika dalam Perspektif Budaya). Ponorogo: Uwais Inspirasi Indonesia.

Nasution, M.S.A., Daulay, M.N.H., Susanti, N., Syam, S. 2015. Ilmu Sosial Budaya Dasar. Jakarta: Rajawali Press.

Noor, J. 2016. Metodologi Penelitian: Skripsi, Tesis, Disertasi dan Karya Ilmiah. Jakarta: Prenada Media Group.

Pais, A. 2010. Criticisms and Contradictions of Ethnomathematics. New York: Springer.

Purbaningrum, M., Cahyani, C.M., Bilad, D.I., Wulandari, E.A., Dewi, D.L., Afifah, N., … Kusuma, R.A. 2021. Etnomatematika Beberapa Sistem Budaya di Indonesia. Sidoarjo: Zifatama Jawara.

Purwaning Tyas, A. S. (2017). Identifikasi Kuliner Lokal Indonesia dalam Pembelajaran Bahasa Inggris. Jurnal Pariwisata Terapan, 1(2), 1–14.

Putri, L.I., Sulistyowati, E., Wijayama, B. 2022. Etnomatematika Dan Pedagogi Guru SD/MI. Semarang: Cahya Ghani Recovery.

Rosa, M., D'Ambrosio, U., Orey, D.C., Shirley, L., Alangui, W.F., Palhares, P., Gavarrete, M.E. 2016. Current and Future Perpectives of Ethnomathematics as a Program. Switzerland: Springer Open.

Rosa, M., Oliveira, C.C. 2020. Ethnomathematics in Action Mathematical Practices in Brazilian Indigenous, Urban and Afro Communities 1st ed. Switzerland: Springer Nature.

Rusman. 2010. Model-model Pembelajaran (Mengembangkan Profesionalisme Guru Edisi Kedua). Raja Grafindo Persada. Jakarta.

Safrina & Saminan. 2015. Pengaruh Pembelajaran Model Problem Based Menunjukkan bahwa penerapan model PBL mempengaruhi pemahaman konsep menjadi lebih baik. Tersedia dalam Jurnal JIP- International Multidisciplinary Jaurnal,Vol 3 (2);1-12

Sungur.Semra & Tekkaya, Cereren. 2006. Effects of Problem- Based Learning And Traditional Instruction On Self- Regulated Learning . The Journal of Education Reserch. Vol 99 (5);307-320

Sugiyono.2013.Metode Penelitian Kuantitatif, Kualitatif dan R & D. Alfabeta. Bandung

Supinah. 2010. Pembelajaran Berbasis Masalah Matematika di SD. Pusat Pengembangan dan Pemberdayaan Pendidik dan Tenaga Kependidikan Matematika. Yogyakarta. Jurnal Pendidikan. Vol 11 (2); 6-8

Suparmi 2015. Penggunaan bahan ajar berbasis PBL di dalam pembelajaran dapat meningkatkan kemampuan berpikir kritis siswa.Jurnal Penelitian. 1 (1); 1 – 16.

Scristia, Meryansumayeka, Safitri, E., Araiku, J., Aisyah, S. 2022. Development of Teaching Materials Based on Two-Column Proof Strategy on Congruent Triangle Materials. Atlantis Press: Vol. 656.

Sekretariat Negara RI, Undang-Undang Nomor 20 Tahun 2003 tentang Sistem Pendidikan Nasional.

Sudarma, I.K., Prabawa, D.G.A.P., Suartama, I.K. 2022. The Application of Information Processing Theory to Design Digital Content in Learning Message Design Course. International Journal of Information and Education Technology: Vol. 12 No. 10.

Sudjana. 2005. Metoda Statistika. Bandung: Tarsito.

Suharta, I.G.P., Parwati, N.N., Pujawan, I.G.N. 2021. Integration of Ethnomathematics in Learning Geometry Transformation. Atlantis Press: Vol. 566.

Susilawati, S.A., Musiyam, M., Wardana, Z.A. 2021. Pengantar Pengembangan Bahan dan Media Ajar. Surakarta: Muhammadiyah University Press.

Syafriafdi, N., Fauzan. A., Arnawa, I.M., Anwar, S., Widada., W. 2019. The Tools of Mathematics Learning Based on Realistic Mathematics Education Approach in

Elementary School to Improve Math Abilities. Universal Journal of Educational Research: Vol. 7 No. 7.

Tarmidzi, Irmawan, W., Nisniani. 2014. Pembelajaran Matematika Dengan Berpikir Dan Berdiskusi Untuk Meningkatkan Kemampuan Representasi Matematis. Delta: Vol. 2 No.1.

Tilman, Daniel.2013. Implication Of Problem Based Learning (PBL) In Elementary School Upon The K- 12 Engineering Education Pipeline American Society For Engineering Education.Vol 23 (2); 32-43.

Tjahyadi, I., Wafa, H., Zamroni, M. 2019. Kajian Budaya Lokal. Lamongan: Pagan Press.

Zaenuri, Dwidayati, N., Suyitno. A. 2018. Pembelajaran Matematika Melalui Pendekatan Etnomatematika (Studi Kasus Pembelajaran Matematika di China). Semarang: UNNES Press.

Zaenuri, Muhtadi, D., Hidayah, N., Utami, R., Dianita, N.K., Hamidah, … Kusuma, J.W. 2021. Etnomatematika Nusantara. Tasikmalaya: Perkumpulan Rumah Cemerlang Indonesia.