

The New Way Improve Mathematical Literacy in Elementary School: Ethnomathematics Module with Realistic Mathematics Education

Yuliana¹, Budi Usodo², Riyadi³

¹ Postgraduate of Primary Teacher Education, Universitas Sebelas Maret, Surakarta, Indonesia

² Department of Mathematics Education, Universitas Sebelas Maret, Surakarta, Indonesia

³ Postgraduate of Primary Teacher Education, Universitas Sebelas Maret, Surakarta, Indonesia

ARTICLE INFO

Keywords:

mathematical literacy;
ethnomathematics;
realistic mathematics education;
elementary school.

Article history:

Received 2021-07-30

Revised 2022-08-18

Accepted 2022-10-18

ABSTRACT

Mathematical literacy is the basis for students to fully understand learning in the 21st-century era. The low mathematical literacy ability of students in elementary schools reduces the quality of education and participation of students in everyday life. Therefore, there is a need to develop learning modules to increase student literacy. Using an ethnomathematics-based teaching module with the RME approach is one solution. The goal of this development research is to create teaching modules that can improve the mathematical literacy of fifth-grade elementary school students. The research subjects were students and teachers of fifth-grade elementary schools in Petanahan District. Observation, interviews, questionnaires, documentation, and tests are used as data collection methods. Both qualitative descriptive analysis and quantitative analysis were used to process the data. The results showed that the validation was rated as very good category by linguists 93.8%, material 94%, and design experts 92%. According to students responses, the practicality level falls within the 87.65% very good category. The effectiveness of the teaching module on mathematical literacy can be seen from the significance level $0.000 < 0.05$, teaching module has a positive effect on improving mathematical literacy of fifth-grade students in elementary school. So, the ethnomathematics-based teaching module with a realistic mathematics education approach to improve mathematical literacy is valid, practical, and effective. Research and development of this ethnomathematics-based teaching module has been proven effective only in Petanahan District, it needs to be tested for effectiveness in a wider population so that it can be used more widely. Other researchers can develop similar teaching modules by taking ethnomathematics in other areas.

This is an open access article under the [CC BY-NC-SA](#) license.



Corresponding Author:

Yuliana

Universitas Sebelas Maret; e-mail: anayuliana703@student.uns.ac.id

1. INTRODUCTION

Literacy is a basic skill that students must acquire (Sumirattana, Makanong, & Thipkong, 2017). Mathematical literacy is as important as literacy skills (Geiger, Goos, & Forgasz, 2015) and students in the 21st century need to have to keep up with the times (Geiger et al., 2015; Rizki & Priatna, 2019). Because of mathematical literacy is the ability of students to process and apply mathematical knowledge in everyday life (OECD, 2018; Stacey, 2011; Stacey & Turner, 2015). Someone who has mathematical literacy skills tends to solve everyday problems easily (Genc & Erbas, 2019; Rahmawati, Usodo, & Fitriana, 2021). Students with literacy at a high level can solve generalized problems (Suryapuspitarini, Wardono, & Kartono, 2018). Mathematical literacy is one of the benchmarks for determining the success of education in elementary schools (Saleh, Prahmana, Isa, & Murni, 2018).

However, many students don't like mathematics (Syafitri, Putra, & Noviana, 2020). Based on the results of the 2018 PISA survey released by the OECD, Indonesia's average mathematical literacy reached 379, with an OECD average score of 489 (OECD, 2019). According to PISA results, Indonesia consistently ranks in the bottom 10 in mathematical literacy assessments. Literacy assessment in Indonesia is carried out through the Minimum Competency Assessment (AKM) (Patriana, Sutarna, & Wulandari, 2021). Minimum Competency Assessment (AKM) is the basic competencies assessment all students to develop their skills and play an active role in society in positive value activities such as reading, writing, and numeracy (Rohim, Rahmawati, & Ganestri, 2021).

The low level of numeracy literacy in solving AKM questions is also found in research (Cahyanovianty & Wahidin, 2021), where 75% of students are more dominant in having moderate numeracy abilities. This shows the low mathematical literacy of elementary school students. The low literacy ability of elementary school students is found in the results of research (Putra, Agmadya, & Syahrilfuddin, 2021). Most students consider Mathematics a difficult subject, so there is less interest in learning (Rahmatullah, Riyadi, & Indriati, 2021; Syafitri et al., 2020).

The impact of the covid-19 pandemic is that learning is not effective, especially in elementary schools (Bozkurt, Jung, Xiao, & Vladimirsch, 2020). Learning activities are carried out using blended learning (Mali & Lim, 2021). Teachers as educators have a role as facilitators, facilitating learning so that learning goes according to goals (Ideswal, Yahya, & Alkadri, 2020). The facilitator must be able to create innovative learning modules which, in their application, can make students enthusiastic about learning independently (Fachrur, Rika, & Rahayu, 2021).

Teaching modules are interesting learning resources, easy to understand, and include certain materials (Tjiptiany, As'ari, & Muksar, 2016) that can help students to become literate. Teaching modules can help students learn and solve problems independently (Syahril, Asrial, Kurniawan, & Piyana, 2019). Teaching modules can generate desire and generate motivation in students (Ferdianto, Setiyani, & Nurulfatwa, 2019) and activate students (Logan, Johnson, & Worsham, 2021). So in learning the teaching module can be used by students to learn independently.

However, observations indicate that students' low mathematics literacy is due to the unavailability of appropriate learning resources. In line with research (Hadiyanti et al., 2021), the low mathematical literacy in senior high schools of which is that there are no special learning resources for mathematical literacy. In the public elementary school in Petanahan sub-district, there are no special learning resources to improve students' mathematical literacy. Improving literacy skills begins with increasing interest in reading (Verschaffel, Schukajlow, Star, & Van Dooren, 2020). Learning resources that can help increase literacy interest are modules (Khikmiyah, 2016).

The solution to overcome this is by developing an ethnomathematics-based teaching module with a realistic mathematics approach. Ethnomathematics is ethnomathematics related to mathematical practices (mathematical practices), mathematical ideas (mathematical ideas), and mathematical knowledge (mathematical knowledge) of a socio-cultural group of society (Dominikus, 2018). The cultural diversity that exists in Indonesia is a good opportunity when it comes to education because it makes learning meaningful. Linking ethnomathematics to mathematics learning helps students understand the material (Fajriyah, 2018).

2.1 Define Stage

At this initial stage, review basic competencies, formulate learning objectives as outlined in developing lesson plans, and analyze outcomes, including types and sources of data or research of learning disabilities and potential resources. Curriculum analysis is performed by examining the Initial data collection is conducted through curriculum analysis, learning media, and interviews with teachers of other mathematics subjects in relation to topics or materials that often present problems in developing mathematical literacy.

Table 1. Types and Sources of Data in the Defining Stage

Number	Type of Data	Data Sources/ Analysis Results
1.	Study of learning difficulties in Geometry topic	reference to national and international research results
2.	Potential resource (teachers, students)	field observation result
3.	Study of basic competence content and learning implementation plan	Permendikbud number 21 year 2016
4.	Study of the learning module used	<ul style="list-style-type: none"> • The learning module used is not varied • Has not stimulated mathematical literacy skills

2.2 The Design Stage

The design stage is carried out by designing a prototype teaching module. In this study, the design phase consisted of determining the form of the teaching module, determining the teaching module, and designing the initial module format. After the format selection is complete, the next step is to create a digital script in the form of word file. Then, after that, it is be converted to a PDF file and printed.

Table 2. Module Design

Program Files	Contents
Format selection	The format used is can be opened on a PC (exe file) and also can be opened directly/hard file.
Design early	This phase includes the initial creation of module <ul style="list-style-type: none"> • word • pdf • exe

2.3. The Develop Stage

The format of the teaching module consists of a cover page, an introduction section, a core section and a final section. The introductory part consists of an introduction, table of contents, KI and KD learning objectives, and instructions for using teaching modules. The core part consists of learning materials, practice questions, summaries and competency tests. The final part consists of a glossary, answer keys, a bibliography, and author biodata.

Table 3. Module Development

Module title	II. Core Part
Subject	Learning materials
Name Topic / Class Learning Material	Self Assessment Exercise
Author of the table of contents	Summary
Glossary	Competence test

I. Introduction

KD and GPA
 Brief description of the material, rational,
 Precondition
 Instructions for using the module

III. Final Part

Glossary
 Answer key
 Bibliography
 Author biodata

Module Development Trial

1. Expert Validation
2. Student Responses to Learning Using Modules

2.4. Disseminate Stage

This activity is a result of the above three phases, namely, the use of teaching modules in Petanahan District.

Table 4. Module Deployment

Activities	Target	Implementation Date
Wider use of Modules in Seminar	Grade V of Elementary School in Petanahan District All teachers in Petanahan	Mey-June 2022 July 2022

3. FINDING AND DISCUSSION

3.1 Development of Module Based on Ethnomathematics with Realistic Mathematics Education Approach

At the stage of developing the teaching module, the topic developed is the material for building blocks and cubes. The teaching module consists of a cover, identity sheet, introduction, table of contents, instructions for use, learning objectives, materials, summaries, practice questions, competency tests, glossary, answer keys, bibliography and author biodata.

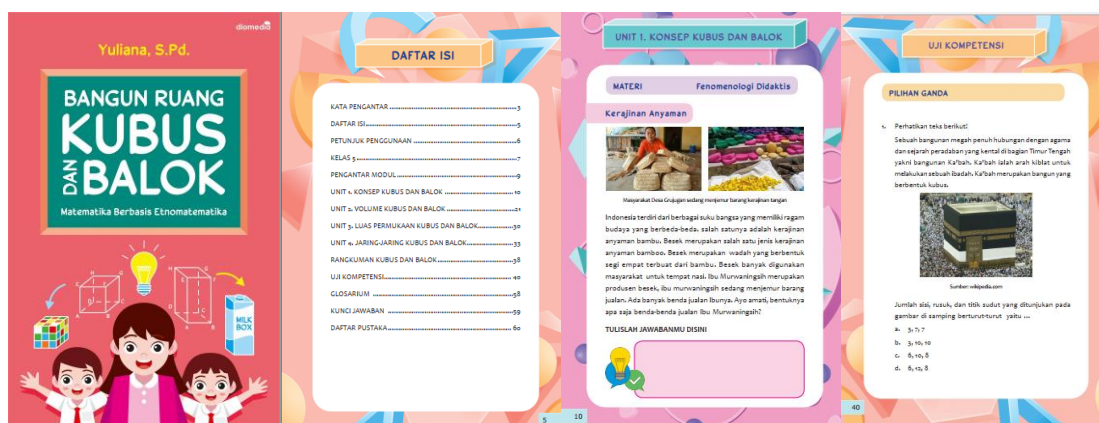


Figure 2. Ethnomathematics-based Teaching Module Display

An expert test was conducted at the development stage to measure the teaching module's quality. Validation was carried out by three experts: linguistics, material and design experts, and media experts. Experts are lecturers and teachers in elementary schools.

Table 5. Linguistics, Material and Design Expert Validation Results

Validator	Percentage	Category	Description
Linguistics	93.8%	Very good	Can be implemented
Material	94%	Very good	Can be implemented
Design	92%	Very good	Can be implemented

According to table 6, it can be seen that based on the assessment indicators that have been determined, language, material and design experts say that the module application is in the very good category, namely 93.8%, 94% and 92%. Overall, the module was deemed interesting by expert commentators and used as a module for learning mathematics on the geometry topic. The suggestions for improvement module are the module instructions should be more detailed to make it easier for users to understand and add general information about the module.

3.2 Student's Responses to Mathematics Learning Using Modules

After the validation was carried out, the practicality test was carried out by applying it to a limited group. The practicality test was carried out at SD Grujugan with 22 respondents with an average percentage of student responses, namely 87.65%

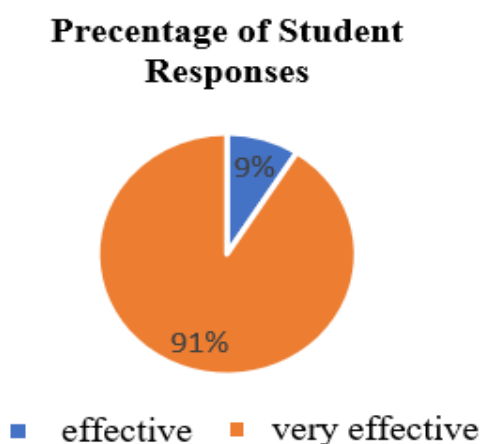


Figure 3. Percentage of Student Responses

The majority response, namely 91% of students, to the application of ethnomathematics-based teaching modules is very practical. This shows that the teaching module has been implemented properly according to the stages. The learning module is considered to have excellent practicality by students

3.2 Effectiveness of Mathematics Learning Using Modules

The Disseminate stage consists of three phases: validation testing, packaging and diffusion and adoption. Validation testing is done by implementing an ethnomathematics-based teaching module with an RME approach on the real target or target. The target is the fifth-grade elementary school students in Petanahan District. Validation testing is used to test the effectiveness of the teaching module on the real population. The effectiveness test was conducted at the Petanahan sub-district elementary school. The research sample was 17 students at SDN Tanjungsari as the control class and 26 students at SDN 1 Jogomertan as the experimental class. The research sample was selected by random sampling.

Data processing is done with SPSS-23 software. The table shows the result of the effectiveness test at the 0.05 significance level.

Table 6. Summary of Effectiveness Test Results

Test	Class	Average	Type of test	Result	Decision	Conclusion
Normality	Experiment	65.5385	Kolmogorov-smirnov	0.200	H ₀ accepted	Normally distributed
	Control	50.5882		0.200	H ₀ accepted	Normally distributed
Homogeneity			Levene	0.620	H ₀ accepted	Homogenous
Hypothesis			T-test	0.000	H ₀ rejected	Any differences

Hypothesis testing between the control and experimental class with the assumption of homogeneous data has a significant level of 0.000. The significance level for the t-test is $0.000 < 0.0$, H₀ is rejected. It means that the control and experimental class data have differences in the value of mathematical literacy. This means that the experimental and control classes have different mathematical literacy skills. Judging from the average of the experimental class has an average of $65.5385 > 50.5882$ the average of the control class. Based on the findings above it can be concluded that the ethnomathematics based teaching module is effectively used to improve the mathematical literacy skills of fifth-grade elementary school students.

This research produces an ethnomathematics based teaching module with a realistic mathematics education approach to improve students' mathematical literacy. The development module aims to improve mathematical literacy. The development of the teaching module is based on the needs analysis finding, namely the characteristics of elementary school age students at the concrete operational stage. In line with Piaget's theory, elementary school students with a operational thinking level (Saleh et al., 2018). Students show that students' interest in learning mathematics is also lacking (Fauzi & Arisetyawan, 2020). Moreover, 21st-century learning must be student-centred (Keiler, 2018). This requires students to learn independently.

The prototype of teaching modules assessed by experts shows that the development of ethnomathematical-based teaching modules with the RME approach to improving mathematical literacy is declared valid and feasible to use. Aspects assessed in language validation by the validator are sentence clarity, communicative, dialogical and interactive, conformity with the development of students, conformity with language rules and suitability of the use of icons, symbols, and terms. Language is adjusted to the thinking stage of elementary school students. The sentences chosen in the teaching module are simple sentences according to the research sample, namely elementary school students. The use of concrete icons, symbols, and terms is adjusted to the thinking stage of elementary school students. In line with Piaget's theory, elementary school students with an operational thinking level (Meylana, Pujiastuti, & Sartono, 2018).

The results of the validation by material experts have an average percentage of 94%. This means that the material in the learning module is in accordance with KD. The importance of the suitability of the material and KD so that learning objectives are achieved (Imania & Bariah, 2019). Learning module subjects correspond to the students' thinking stage, so there isn't misconceptions (Fajriyah, 2018). Teaching modules are equipped with up-to-date materials in order to update knowledge of a science. This is because science is always evolving with the times. This teaching module is also designed to encourage student curiosity so that students are interested in using the teaching module. The addition of new materials and information will attract students to learn (Hadiyanti et al., 2021).

Design validation is assessed from aspects of module size, cover design, content design, presentation support, learning presentation, and coherence and sequence of thought patterns that are adjusted to the development of students. The cover design and design of the contents of the teaching module and cover are adjusted to the material for building cubes and blocks and made in color to attract students to learn. This is because elementary school students are at the stage of concrete thinking (T. N. Utami, Jatmiko, & Suherman, 2018).

The results of product trials to measure the practicality of their teaching modules convey that teaching modules can be used easily, are easy to understand, and have interesting pictures according to their characteristics (Schoevers, Leseman, & Kroesbergen, 2020). The positive response to the teaching module is also because there is a cultural touch (ethnomathematics) in the material that is easy to find in everyday life. This is in line with the opinion (Aikenhead, 2017; Fachrur et al., 2021) that culture is very close to students so it attracts students to learn. The ethnomathematics-based teaching module developed is a new learning resource so that it attracts students to learn. The diversity of learning resources for students increases student interest in learning (Kurniasari, Rakhmawati, & Fakhri, 2018). Teaching modules can also be used independently by students both at school and at home. The results of the practicality test showed very good results.

The results of the effectiveness test were carried out by experimenting with students. The effectiveness test is carried out after the validity test and practicality test so that the ethnomathematics-based teaching module is feasible to use in learning. The effectiveness test results showed that the ethnomathematics-based teaching module with a realistic mathematics education approach had a positive effect on students' mathematical literacy. The effectiveness of ethnomathematics-based teaching modules is supported by (Agusdianita, Karjiyati, & Sufiyandi, 2021; Johnson & Corey, 2020; Laurens, 2016) namely through ethnomathematics it can improve students' cognitive abilities. A realistic mathematics education approach, it can improve students' mathematical literacy (Sumiyati, Netriwati, & Rakhmawati, 2018). Recommendations that can be considered are the benefits obtained from ethnomathematics-based teaching modules can be made independently because the culture around us can be used as material for meaningful learning. Through things that are close to students, learning materials can be developed (Nuh & Dardiri, 2016; Sumirattana et al., 2017). There is flexibility in teaching modules so that teaching modules can be used at home or at school.

4. CONCLUSION

Based on the research and development results, it can be concluded that the ethnomathematics-based teaching module with a realistic mathematics education approach to improve mathematical literacy is valid, practical, and effective. The validation results were rated as very good category by linguists 93.8%, material 94%, and design experts 92%. According to students' responses, the practicality level falls within the 87.65% very good category. The effectiveness of the teaching module on mathematical literacy can be seen from the significance level $0.000 < 0.05$, the teaching module has a positive effect on improving the mathematical literacy of fifth-grade students in elementary school. Research and Development of this ethnomathematics-based learning module has been proven effective only in Petanahan District, and it needs to be tested for effectiveness in a wider population so that it can be used more widely. Other researchers can develop similar teaching modules by taking ethnomathematics in other areas. Other researchers can also use other approaches besides the RME approach to improving students' mathematical literacy.

REFERENCES

- Abdullah, A. S. (2017). Ethnomathematics in Perspective of Sundanese culture. *Journal on Mathematics Education*, 8(1), 1–16. <https://doi.org/10.22342/jme.8.1.3877.1-15>
- Agusdianita, N., Karjiyati, V., & Sufiyandi. (2021). The Use of Ethnomathematics Learning Devices Based on Realistic Mathematics Education Models on Mathematics Literacy Mastery. *Proceedings of the International Conference on Educational Sciences and Teacher Profession (ICETeP 2020)*, 532(532), 317–324. <https://doi.org/10.2991/assehr.k.210227.054>
- Aikenhead, G. S. (2017). Enhancing School Mathematics Culturally: A Path of Reconciliation. *Canadian Journal of Science, Mathematics and Technology Education*, 17(2), 73–140. <https://doi.org/10.1080/14926156.2017.1308043>
- Astriandini, M. G., & Kristanto, Y. D. (2021). Kajian Etnomatematika Pola Batik Keraton Surakarta Melalui Analisis Simetri. *Mosharafa: Jurnal Pendidikan Matematika*, 10(1), 13–24. <https://doi.org/10.31980/mosharafa.v10i1.831>

- Bozkurt, A., Jung, I., Xiao, J., & Vladimirschi, V. (2020). A Global Outlook to The Interruption of Education Due to COVID-19 Pandemic: Navigating in A Time of Uncertainty and Crisis. *Asian Journal of Distance Education*, 15(1), 1–126. <https://doi.org/10.5281/zenodo.3878572>
- Cahyanovianty, D. A., & Wahidin. (2021). Analisis Kemampuan Numerasi Peserta Didik Kelas VIII dalam Menyelesaikan Soal Asesmen Kompetensi Minimum. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 05(02), 1439–1448.
- Dominikus, W. S. (2018). Etnomatematika dalam Permainan Kemoti di Adonara. *Pendidikan Dan Pembelajaran Di Era Abad 21*, (33), 243–254. Kupang: PMIPA PRESS.
- Fachrur, R., Rika, W., & Rahayu, N. P. (2021). Ethnomathematics : Electronic Math Module Based on Madura Batik in Improving Creative Thinking Skills. *Atlantis Press*, 550(Icmmmed 2020), 266–275. Retrieved from <http://creativecommons.org/licenses/by-nc/4.0/>.
- Fahmy, A. R. ., Wardono, & Masrukan. (2018). Kemampuan Literasi Matematika dan Kemandirian Belajar Siswa Pada Model Pembelajaran Rme Berbantuan Geogebra. *PRISMA: Prosiding Seminar Nasional Matematika*, 1(22), 559–567.
- Fajriyah, E. (2018). Peran Etnomatematika Terkait Konsep Matematika dalam Mendukung Literasi. *PRISMA: Prosiding Seminar Nasional Matematika*, 1, 114–119. Retrieved from <https://journal.unnes.ac.id/sju/index.php/prisma/>
- Fauzi, I., & Arisetyawan, A. (2020). Analisis Kesulitan Belajar Siswa pada Materi Geometri Di Sekolah Dasar. *Kreano, Jurnal Matematika Kreatif-Inovatif*, 11(1), 27–35. <https://doi.org/10.15294/kreano.v11i1.20726>
- Ferdianto, F., Setiyani, & Nurulfatwa, D. (2019). 3D Page Flip Professional: Enhance of Representation Mathematical Ability on Linear Equation in One Variable. *Journal of Physics: Conference Series*, 1188(1), 1–9. IOP Publishing. <https://doi.org/10.1088/1742-6596/1188/1/012043>
- Geiger, V., Goos, M., & Forgasz, H. (2015). A Rich Interpretation of Numeracy for the 21st Century: A Survey of the State of the Field. *International Journal on Mathematics Education*, 47(4), 531–548. <https://doi.org/10.1007/s11858-015-0708-1>
- Genc, M., & Erbas, A. K. (2019). Secondary Mathematics Teachers ' Conceptions of Mathematical Literacy To cite this article : Secondary Mathematics Teachers ' Conceptions of Mathematical Literacy. *International Journal of Education in Mathematics, Science and Technology*, 7(3), 222–237.
- Hadiyanti, N. F. D., Hobri, Prihandoko, A. C., Susanto, Murtikusuma, R. P., Khasanah, N., & Maharani, P. (2021). Development of Mathematics E-module with STEM-Collaborative Project Based Learning to Tmprove Mathematical Literacy Ability of Vocational High School Students. *Journal of Physics: Conference Series*, 1839(1). <https://doi.org/10.1088/1742-6596/1839/1/012031>
- Handun, Habudin, & Rachmiati, W. (2020). The Influence of Using Realistic Mathematics Instruction on. *PRIMARY*, 12(01), 67–76.
- Ideswal, Yahya, & Alkadri, H. (2020). Kontribusi Iklim Sekolah dan Kepemimpinan Kepala Sekolah Terhadap Kinerja Guru Sekolah Dasar. *BASICEDU*, 4(2), 460–466.
- Imania, K. A., & Bariah, S. K. (2019). Rancangan Pengembangan Instrumen Penilaian Pembelajaran Berbasis Daring. *Jurnal Petik*, 5(1), 31–47. <https://doi.org/10.31980/jpetik.v5i1.445>
- Johnson, J. D., & Corey, D. L. (2020). Reaching the 21st Century Students in the United Arab Emirates : Using Ethnomathematics through #Innovation. *Revemop*, 2(e202012), 1–13.
- Keiler, L. S. (2018). Teachers' roles and identities in student-centered classrooms. *International Journal of STEM Education*, 5(1). <https://doi.org/10.1186/s40594-018-0131-6>
- Khikmiyah, F. (2016). Pengembangan Buku Ajar Literasi Matematika untuk Pembelajaran di SMP. *Silogisme*, 1(2), 15–26.
- Kurniasari, I., Rakhmawati, R., & Fakhri, J. (2018). Pengembangan E-Module Bercirikan Etnomatematika pada Materi Bangun Ruang Sisi Datar. *Indonesian Journal of Science and Mathematics Education*, 1(3), 227–235. <https://doi.org/10.24042/ij sme.v1i3.3597>
- Laurens, T. (2016). Analisis Etnomatematika dan Penerapannya dalam Meningkatkan Kualitas Pembelajaran. *Lemma*, 3(1), 86–96.
- Logan, R. M., Johnson, C. E., & Worsham, J. W. (2021). Development of an E-learning Module to

- Facilitate Student Learning and Outcomes. *Teaching and Learning in Nursing*, 16(2), 139–142. <https://doi.org/10.1016/j.teln.2020.10.007>
- Mali, D., & Lim, H. (2021). How Do Students Perceive Face-to-face/Blended Learning as A Result of the Covid-19 Pandemic? *International Journal of Management Education*, 19(3), 100552. <https://doi.org/10.1016/j.ijme.2021.100552>
- Meylana, D. A., Pujiastuti, P., & Sartono, K. E. (2018). A Preliminary Analysis Study of the Mathematics learning Needs Assessment. *International Conference on Science and Applied Science (ICSAS) 2018, 020079*, 1–8. AIP. Publishing. <https://doi.org/https://doi.org/10.1063/1.5054483> Published
- Muhtadi, D., Sukirwan, Warsito, & Prahmana, R. C. I. (2017). Sundanese Ethnomathematics: Mathematical Activities in Estimating, Measuring, and Making Patterns. *Journal on Mathematics Education*, 8(2), 185–198. <https://doi.org/10.22342/jme.8.2.4055.185-198>
- Mulbar, U., & Zaki, A. (2018). Design of Realistic Mathematics Education on Elementary School Students. *Journal of Physic*, 1–12. IOP Publishing. <https://doi.org/10.1088/1742-6596/1028/1/012155>
- Nuh, Z. M., & Dardiri. (2016). Etnomatematika Dalam Sistem Pembelajaran Pada Masyarakat Melayu Riau. *Kutubkhanah*, 19(2), 220–238. Retrieved from <http://ejournal.uin-suska.ac.id/index.php/Kutubkhanah/article/view/2552>
- Nurkamilah, M., Nugraha, M. F., & Sunendar, A. (2018). Mengembangkan Literasi Matematika Siswa Sekolah Dasar melalui Pembelajaran Matematika Realistik Indonesia. *THEOREMS*, 2(2), 70–79.
- OECD. (2018). *PISA for Development Assessment and Analytical Framework: Reading, Mathematics and Science*. Paris: OECD Publishing.
- Patri, S. F. D., & Heswari, S. (2021). Development of Ethnomathematic-Based on Mathematics E-module to Improve Students' Logical Thinking Skills. *AIP Conference Proceedings*, 2330(March), 1–7. <https://doi.org/10.1063/5.0043250>
- Patriana, W. D., Utama, S., & Wulandari, M. D. (2021). Pembudayaan Literasi Numerasi untuk Asesmen Kompetensi Minimum dalam Kegiatan Kurikuler pada Sekolah Dasar Muhammadiyah. *Jurnal Basicedu*, 5(5), 3413–3430.
- Putra, M. J. A., Agmadya, T., & Syahrilfuddin, S. (2021). Mathematical Literacy Skills of Fifth Grade Elementary School Students: A Case Study in Pekanbaru. *Journal of Teaching and Learning in Elementary Education (Jtlee)*, 4(1), 39–50. <https://doi.org/10.33578/jtlee.v4i1.7842>
- Rahmatullah, R., Riyadi, & Indriati, D. (2021). The Effectiveness of Use of the Learning Media “Relay Board” in Increasing Student's Interest in Learning Mathematics at MTs N Darul Ilmi Banjarbaru. *Proceedings of the International Conference of Mathematics and Mathematics Education (I-CMME 2021)*, 597, 224–227. <https://doi.org/10.2991/assehr.k.211122.031>
- Rahmawati, W. A., Usodo, B., & Fitriana, D. L. (2021). Mathematical Literacy Skills Students of the Junior High School in Solving PISA-Like Mathematical Problems. *IOP Conference Series: Earth and Environmental Science*, 1808(1). <https://doi.org/10.1088/1742-6596/1808/1/012045>
- Rizki, L. M., & Priatna, N. (2019). Mathematical literacy as the 21st century skill. *Journal of Physics: Conference Series*, 1157(4), 8–13. <https://doi.org/10.1088/1742-6596/1157/4/042088>
- Rohim, D. C., Rahmawati, S., & Ganestri, I. D. (2021). Konsep Asesmen Kompetensi Minimum untuk Meningkatkan Kemampuan Literasi Numerasi Siswa Sekolah Dasar. *Jurnal Varidika*, 33(1), 54–62. <https://doi.org/10.23917/varidika.v33i1.14993>
- Saleh, M., Prahmana, R. C. I., Isa, M., & Murni. (2018). Improving The Reasoning Ability of Elementary School Student Through the Indonesian Realistic Mathematics Education. *Journal on Mathematics Education*, 9(1), 41–53. <https://doi.org/10.22342/jme.9.1.5049.41-54>
- Schoevers, E. M., Leseman, P. P. M., & Kroesbergen, E. H. (2020). Enriching Mathematics Education with Visual Arts : Effects on Elementary School Students ` Ability in Geometry and Visual Arts. *International Journal of Science and Mathematics Education*, 8, 1613–1634.
- Stacey, K. (2011). The PISA View of Mathematical Literacy in Indonesia. *Journal on Mathematics Education*, 2(2), 95–126. <https://doi.org/10.22342/jme.2.2.746.95-126>
- Stacey, K., & Turner, R. (2015). Assessing Mathematical Literacy. In *Springer*. New York: Springer. <https://doi.org/10.1007/978-3-319-10121-7>

- Sumirattana, S., Makanong, A., & Thipkong, S. (2017). Using Realistic Mathematics Education and the DAPIC Problem-solving Process to Enhance Secondary School Students' Mathematical Literacy. *Kasetsart Journal of Social Sciences*, 38(3), 307–315. <https://doi.org/10.1016/j.kjss.2016.06.001>
- Sumiyati, W., Netriwati, N., & Rakhmawati, R. (2018). Penggunaan Media Pembelajaran Geometri Berbasis Etnomatematika. *Desimal: Jurnal Matematika*, 1(1), 15. <https://doi.org/10.24042/djm.v1i1.1907>
- Supiyati, S., Hanum, F., & Jailani. (2019). Ethnomathematics in Sasaknese Architecture. *Journal on Mathematics Education*, 10(1), 47–57. <https://doi.org/10.22342/jme.10.1.5383.47-58>
- Suryapuspitarini, B. K., Wardono, & Kartono. (2018). Analisis Soal-Soal Matematika Tipe Higher Order Thinking Skill (HOTS) pada Kurikulum 2013 untuk Mendukung Kemampuan Literasi Siswa. *Prisma, Prosiding Seminar Nasional Matematika*, 1, 876–884. Semarang: UNNES. Retrieved from <https://journal.unnes.ac.id/sju/index.php/prisma/article/view/20393>
- Syafitri, R., Putra, Z. H., & Noviana, E. (2020). Fifth Grade Students' Logical Thinking in Mathematics. *Journal of Teaching and Learning in Elementary Education*, 3(2), 157. <https://doi.org/10.33578/jtlee.v3i2.7840>
- Syahrial, Asrial, Kurniawan, D. A., & Piyana, S. O. (2019). E-Modul Etnokonstruktivisme: Implementasi Pada Kelas V Sekolah Dasar Ditinjau Dari Persepsi, Minat Dan Motivasi. *JTP - Jurnal Teknologi Pendidikan*, 21(2), 165–177. <https://doi.org/10.21009/jtp.v21i2.11030>
- Tjiptiany, E. N., As'ari, A., & Muksar, M. (2016). Pengembangan Modul Pembelajaran Matematika Dengan Pendekatan Inkuiri untuk Membantu Siswa SMA Kelas X dalam Memahami Materi Peluang. *Jurnal Pendidikan: Teori, Penelitian, Dan Pengembangan*, 1(10), 1938–1942. <https://doi.org/10.17977/jp.v1i10.6973>
- Utami, N. W., Sayuti, S. A., & Jailani. (2019). Math and Mate In Javanese Primbon: Ethnomathematics Study. *Journal on Mathematics Education*, 10(3), 341–356. <https://doi.org/10.22342/jme.10.3.7611.341-356>
- Utami, T. N., Jatmiko, A., & Suherman, S. (2018). Pengembangan Modul Matematika dengan Pendekatan Science, Technology, Engineering, And Mathematics (STEM) pada Materi Segiempat. *Desimal: Jurnal Matematika*, 1(2), 165. <https://doi.org/10.24042/djm.v1i2.2388>
- Verschaffel, L., Schukajlow, S., Star, J., & Van Dooren, W. (2020). Word problems in mathematics education: a survey. *ZDM - Mathematics Education*, 52(1), 1–16. <https://doi.org/10.1007/s11858-020-01130-4>

This page is intentionally left blank