Al-Jabar: Jurnal Pendidikan Matematika
Volume 15, Number 02, 2024, Pages 431 – 443
DOI: 10.24042/ajpm.v15i2.22204

Development of ethnofun to improve computational thinking of junior high school students grade VII

Hendrisa Rizqie Romandoni, Swasti Maharani*, Edy Suprapto
Universitas PGRI Madiun, Jawa Timur, Indonesia
✉ edy.mathedu@unipma.ac.id*

Article Information
Submitted July 01, 2024
Revised Sept 25, 2024
Accepted Oct 12, 2024

Keywords
Computational Thinking;
Development;
Ethnomatematics.

Abstract

Background: There is a lack of ethnomathematics learning media for junior high school students on the subject of spatial geometry, hindering the development of their computational thinking skills.
Aim: This study aims to develop learning media to enhance students' computational thinking by leveraging ethnomathematics principles**.**
Method: The research employed the Research and Development (R&D) method using the AADIE model, focusing on designing and implementing ethnomathematics-based learning media**.**
Result: The validation score of the developed media reached 86%, indicating a high level of validity, while the student response questionnaire yielded an 88.89% validation score. The practicality assessment of the ethnofun learning media also scored 86.25%.
Conclusion: The results of the study indicate that ethnomathematics-based learning media have valid and practical criteria for use in improving computational thinking skills of junior high school students. High validity and practicality values indicate that the developed ethnofun media is a feasible tool to improve understanding of spatial geometry and foster students' computational thinking skills.

INTRODUCTION

Computational thinking (CT) is one of the key skills needed to face challenges in today's digital era. CT helps students in solving complex problems in a simpler way (Maharani et al., 2019). It can train the brain to think logically, creatively, and structured. Through CT, students can learn to solve problems with a more systematic and efficient approach. In an educational context, CT is not just about programming or the use of technology, but also about how to think and understand the world (As'ari et al., 2019; Hadi & Maharani, 2022). CT helps students to understand and analyze problems, design solutions, and evaluate outcomes (Kholid et al., 2020). Therefore, it is important for students to develop their CT skills to be able to face the increasingly complex challenges of this digital age.

However, Indonesian education experiences challenges, namely the low ability of CT in students. This can be seen from Indonesia's PISA ranking, which from 2018 to 2023 has not increased. Starting in 2018, PISA began to include assessment of problem-solving and reasoning skills which are aspects of CT (Afgani, 2021). Indonesia received

How to cite Romandoni, H. R., Maharani, S., & Suprapto, E. (2024). Development of ethnofun to improve computational thinking of junior high school students grade VII . *Al-Jabar: Pendidikan Matematika*, *15*(2), 431-443.
E-ISSN 2540-7562
Published by Mathematics Education Department, UIN Raden Intan Lampung

an average score of 371, 379, and 396 in reading, mathematics, and science, respectively, which is still far from the average of all participating countries.

Another finding can be seen from the difficulty of junior high school students in Magetan Regency in solving HOTS-based AKM questions in the 2022/2023 school year. According to Prastiti et al. (2020) solving HOTS problems requires high CT skills. Decomposition on CT allows students to break down the HOTS problem into smaller, easy-to-understand parts (Ambarwati & Ekawati, 2022; Aulia et al., 2023). AKM scores from 3 categories, namely content, context, and cognitive level, have not been maximized (Hidayah et al., 2021). One of the materials at the cognitive level category is space building material (Ayni et al., 2023; Jumrah et al., 2023).

Meanwhile, building space material is considered difficult for some students to understand. One of the main causes is the abstract nature of the mathematical concepts involved in understanding geometric shapes in three dimension (Putri & Astawan, 2022). Students have difficulty visualizing these objects mentally. In addition, limited practical experience or lack of connection with the context of everyday life can be an obstacle. Less interactive teaching media and limited learning approaches in providing real examples can also make it difficult for students to feel the relevance and usefulness of the concept of building space (Anugrahana, 2018; Zaintika et al., 2021). According to Angraini et al. (2022) The use of interactive learning media is very lacking in the world of mathematics education. While mathematics is an abstract science that requires media as a visualizer. This is why the stigma of difficult mathematics continues to grow in society.

Therefore, education in the digital era requires continuous innovation in order to meet the demands of technological developments and student learning needs. Education in the digital era demands continuous innovation to answer the challenges of technological developments and meet students' learning needs (Abdillah et al., 2021). One of the relevant innovations is the integration of technology in the development of learning media, especially in the context of building space materials at the junior high school level. Technology-based learning media has great potential to increase students' understanding of the concepts of building space visually and interactively. Learning media such as simulations, animated videos, and 3D models, students can explore a deeper understanding of the properties of building space through enthralling visual experiences.

A concrete example is the utilization of *flipbook* technology that provides interesting audio and visual features, as well as allows students to actively interact with the material (Erna et al., 2021; Munir, 2023). Ethnomathematics is the study of the relationship between mathematics and culture. It explores how different cultural groups understand and use mathematical concepts within their own context. By incorporating ethnomathematics into education, students can connect abstract mathematical ideas with their cultural heritage, making learning more meaningful and relatable. In the context of learning spatial construction, ethnomathematics plays a vital role. It allows students to explore geometrical shapes and space-related concepts through the lens of their own cultural practices. For example, many traditional arts and crafts, such as weaving,

architecture, and patterns in textiles, involve complex geometric shapes and spatial reasoning. By relating these practices to mathematical principles, students can see the relevance of the subject in real-life applications. Research has shown that integrating ethnomathematical elements into learning media, particularly in the study of spatial construction, enhances students' understanding and retention of the material. Interactive and visual learning media enriched with ethnomathematical elements not only boost student motivation but also help them gain a deeper, more applicable understanding of spatial concepts. This approach makes the learning experience richer, more contextual, and ultimately more effective.

In recent years, the development of learning media in the form of *flipbooks* has begun to be developed in mathematics learning. *Flipbooks* are developed for the reason of the features that can be explored on *flipbooks* (Rahadhian et al., 2022). Previous research has developed *flipbooks* on a variety of mathematical materials including rows and rows, sets and even to improve *critical thinking* in students (Dharmayanti et al., 2021; Erna et al., 2021; Wibowo & Pratiwi, 2018). Other research highlights the development of learning media that are relevant to local culture and utilize modern technology, namely ethnomathematics-based mathematics flipbooks (Munir, 2023). However, the study still has shortcomings, namely the limitations of material in algebra and has not integrated questions that hone and improve CT skills.

Seeing these problems, there is a novelty to develop interactive learning media in the form of *flipbooks* called Ethnofun. Ethnofun is a combination of the words "Ethnomathematics" and "Fun". Ethnofun as an innovative learning medium that can stimulate computational thinking skills in grade VII junior high school students. Ethnofun learning media that integrates ethnomathematics and cultural elements in mathematics learning, offers a new approach to improve *computational thinking*. Through presenting space in an interactive ethnic context, Ethnofun can motivate students to think creatively, design geometric models, and connect mathematical concepts with their cultural reality. The development of Ethnofun becomes relevant in the context of a mathematics curriculum that demands the integration of CT. This research is expected to contribute to the development of mathematics learning media that are more interesting and relevant to today's educational needs.

METHODS

Design:

The type of research used in this study is Research and Development (R&D). The research was carried out using the ADDIE type of model development. The ADDIE model consists of five stages, namely Analysis, Design, Development, Implementation, and Evaluation .

Participants:

The population in this study is all grade VII students Magetan Regency for the 2023/2024 academic year. The total number of grade VII students. The sample in this study consisted of 24 students from class VII B. The method used for sample selection was

probability sampling techniques, especially simple random sampling. This study chose this technique because it provides equal opportunities for each member of the population to be selected into the sample, thus ensuring a fair representation of the entire population of grade VII B students.

Instrumen:

This study uses several instruments to collect the necessary data including the following:

1. Validation sheet that aims to evaluate the quality of Ethnofun learning media from the perspective of material and media. Two experts, namely material experts and media experts, were given validation sheets to assess the suitability of the material to the curriculum, the validity of the material content, and the effectiveness of the media in delivering the material.
2. Student response questionnaire which aims to determine student responses to Ethnofun learning media. This questionnaire is given to students after they use the media, covering aspects such as the suitability of the material to student interests, ease of use of media, and the benefits of media in understanding learning material.

Data Analysis:

Some of the analyses carried out on development with the ADDIE method are as follows:

1. Validity Analysis Ethnofun

Ethnofun will be evaluated thoroughly by validators, who in this case are mathematics teachers. The components evaluated include the display of content, language and interactivity *of* Ethnofun. In this case, the aspects assessed range from 1-5 with details 1 (Not Good), 2 (Less Good), 3 (Good Enough), 4 (Good), 5 (Very Good). The validity formula of the 2 validators is as follows.

$$v = \frac{vah_1 + vah_2}{2}$$

$v =$ Combined validity
$vah_1 =$ Validity value of validator 1
$vah_2 =$ Validity value of validator 2

With validity categories according to Abdal et al., (2023) as follows.

Table 1. Validity Categories

No	Angka	Validity Categories
1	85,1% -100%	Very valid or usable without revision
2	70,1% - 85%	Quite valid or usable with minimal revision
3	50,1% – 70%	Less valid or recommended not to be used because it needs major revision
4	0,1% - 50%	Invalid or should not be used

2. Practicality Analysis

The formula of practicality is as follows:

$$Vp = \frac{TSEp}{S - Max} x100\%$$

Information:

Vp : Validity of practicality

$TSEp$: Total Empirical Score of Practicality

$S - Max$: Expected Max Score

According to Suganda et al. (2023) The criteria are set as follows.

Table 2. Practicality Categories

No	Intervensi	Practicality Categories
1	85,1% -100%	Very practical or can be used without revision
2	70,1% - 85%	Quite practical or can be used with minimal revision
3	50,1% – 70%	Less practical or recommended not to be used because it needs major revisions
4	0,1% - 50%	Impractical or should not be used

The flow of research carried out is presented in Figure 1.

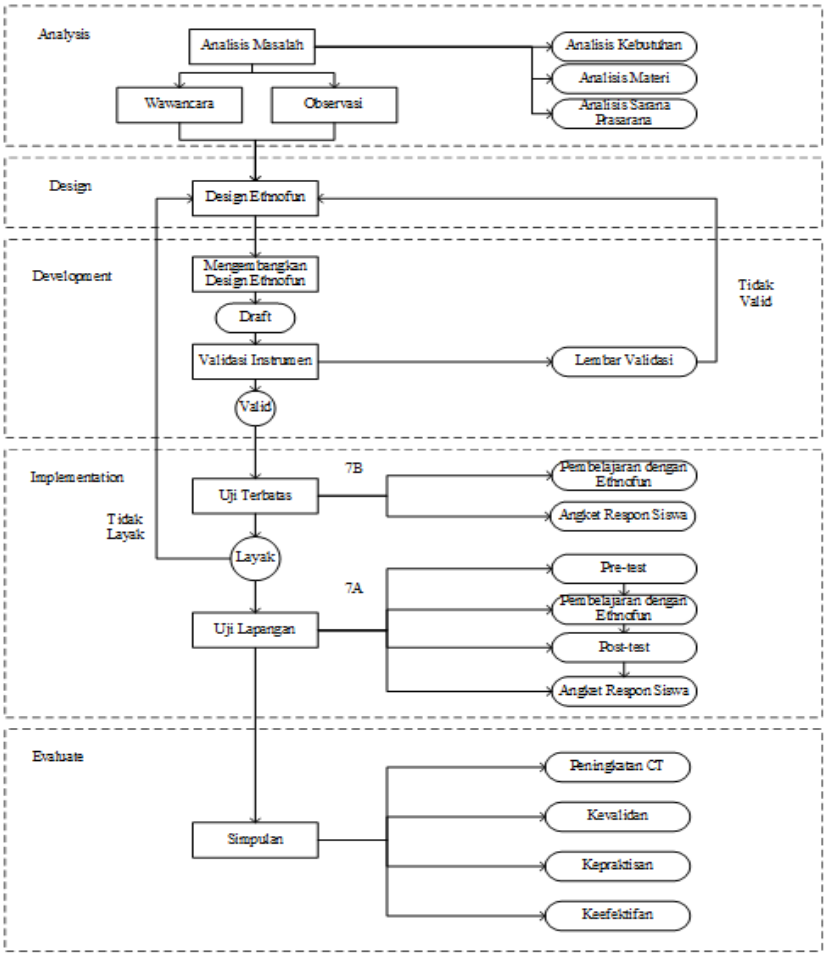

Figure 1. Research Flow

RESULTS AND DISCUSSION

Based on the research and development of Ethnofun learning media that has been carried out, the following results were obtained:

Analysis

1. Needs Analysis

Mathematics learning is still conducted using conventional methods, with a focus on delivering material and solving problems. This traditional approach has resulted in students lacking enthusiasm and struggling to grasp mathematical concepts. Moreover, students' computational thinking (CT) abilities are still low, as the current teaching methods do not adequately foster these skills. Additionally, there has been no development of mathematics learning media that integrates ethnomathematics into the curriculum. The learning resources are limited to textbooks and occasional YouTube videos, which are often too generic and fail to engage students effectively. This lack of interactive and culturally relevant materials contributes to students feeling disengaged and confused, further hindering their ability to develop strong CT skills.

2. Learning Material Analysis

Based on the results of research observations unstructured interviews with teachers, it is known that this school implements the Independent Curriculum. One of the challenges faced by grade 7 students is in understanding the material of building space. This material is often a scourge for students because they have difficulty visualizing various forms. Limitations in visualizing these spatial shapes can affect students' understanding of basic concepts in geometry. This may hinder students' ability to solve mathematical problems related to building space.

3. Analysis of Infrastructure

Learning facilities and infrastructure shows that the school has fairly complete facilities. There is an LCD in the computer room and a shared study room that can be used to support the learning process. However, its utilization has not been optimal.

Design

1. Instrument Arrangement

a) Ethnofun Validation Sheet

The validation sheet for ethnofun learning media in the building room material consists of 12 statement items. Each statement refers to aspects of content feasibility, language, activities, as well as implementation and measurement. The rating is carried out on the following scale: 5 for very good, 4 for good, 3 for good enough, 2 for not good, and 1 for very not good. At the end of the sheet, validators have the opportunity to make suggestions for the development of the tool.

b) Student Response Questionnaire Validation Sheet

The validation sheet for the student response questionnaire that has been prepared is 9 points of statements. The statement statement on the validation sheet contains the hint aspect, the content aspect and the language aspect with ratings, 5: very good, 4:

good, 3: good enough, 2: not good and 1: very ungood. At the end of the sheet the validator can give suggestions for the developed device.

c) Student Response Questionnaire

The student response questionnaire sheet contains 15 statement items that are used to see and assess several aspects, namely interests, material, and language when students use Ethnofun learning media. The statement consists of 8 positive statements and 7 negative statements. Students can tick the "Strongly Agree," "Agree," "Disagree Less," or "Disagree" columns.

2. Initial Design

The initial design of Ethnofun as a learning medium involved using a flipbuilder application to create a digital book. This digital book is designed to present material about building space with an ethnomathematical approach, which is also accompanied by a series of questions aimed at improving students' computational thinking skills. In addition, Ethnofun also includes learning videos that can be played directly in the digital book.

Development

1. Results of Ethnofun Learning Media Development

Ethnofun is made in the form of an exe-shaped flipbook, designed as attractive as possible, and uploaded to Google Drive to make it easier for students to access it at any time. In addition, there is also ethnofun in pdf form to make it easier for students who have difficulty in accessing. Ethnofun in pdf and application form can be accessed through the page https://bit.ly/myethnofun.

2. Validation of Ethnofun Learning Instruments and Media

Validation of Ethnofun learning instruments and media aims to ensure the validity of the developed media. If the results show that they are not yet valid, the learning media must be revised again. The validators in this validation test consist of two experts, namely Drs. Heri Samuji who is a teacher who teaches mathematics subjects as a media expert and practitioner (Validator I). Then Endang Mujiatun, S.Pd who is a teacher who teaches mathematics as a media expert and practitioner (Validator II).

a) Ethnofun Learning Media Validation

The results of the validation of Ethnofun learning media are presented in Table 3.

Table 3. Ethnofun Learning Media Validation

Result	Validator	
	I	II
Total Score obtained	51	52
Total Maximum Score	60	60
Validation Percentage	85%	87%
Combined Percentage	86%	

Based on Table 3, Ethnofun learning media has 86% validity or is said to be valid.

b) Validation of Student Response Questionnaire

The results of the validation of student response questionnaires are presented in Table 4.

Table 4. Validation of Student Response Questionnaire

Result	Validator	
	I	II
Total Score obtained	39	41
Total Maximum Score	45	45
Validation Percentage	86.67%	91.11%
Combined Percentage	88.89%	

Based on Table 4. The student response questionnaire has a validity of 88.89% or is said to be valid and can be used.

Implementation

1. Limited Trial

A limited trial was conducted on May 7, 2024, involving 8 grade VII C students to examine the practicality of Ethnofun learning media in building space materials. The selection of students is carried out based on the recommendation of the mathematics teacher. The media is used together with research instruments in the form of student response questionnaires, for 5 hours of lessons. The material of building space is delivered by introducing ethnomathematical concepts in its context. Students are divided into heterogeneous groups for discussion and doing CT practice questions. Some students then presented the results of their discussions in front of the class, before all participants were asked to fill out a response questionnaire as an evaluation of the Ethnofun learning media. The results of the student response questionnaire can be seen in Table 5.

Table 5. Results of the Ethnofun Practicality Test on Limited Trials

The practicality of Ethnofun	
T-Sep Combined	414
S-Max Combined	480
Combined Percentage	86.25%
Very Practical Categories	

Based on Table 5 shows that Ethnofun learning media get a percentage of 86.25%. According to Suganda et al. (2023), a percentage of 86.25% falls into the very practical category that can be used without revision. This means that Ethnofun learning media can be carried out field tests.

2. Field Trials

On May 11, 2024, a field trial was conducted involving 24 students from class VII B. The purpose of this trial is to examine the practicality of Ethnofun Learning Media in teaching space building material. The selection of students is carried out based on the recommendations of the mathematics teacher. During the 5 hours of lessons, the media was used together with student response questionnaires as research instruments. The

material of building space is delivered by introducing ethnomathematical concepts in its context. Students are divided into heterogeneous groups to have discussions and do CT practice questions. After that, several students presented the results of their discussions in front of the class. Finally, all participants were asked to fill out a response questionnaire as an evaluation of Ethnofun learning media. The results of the student response questionnaire in this field test are presented in Table 6.

Table 6. Results of Ethnofun Practicality Test in Field Trials

The practicality of Ethnofun	
T-Sep Combined	1252
S-Max Combined	1440
Combined Percentage	86.94%
Very Practical Categories	

Based on Table 6 shows that Ethnofun learning media get a percentage of 86.94%. According to Suganda et al. (2023), a percentage of 86.94% falls into the very practical category, which can be used without revision. This means that *the* Ethnofun learning media developed meet practical criteria.

Evaluate

1. Analysis of the Validity of Ethnofun Learning Media

The results of this study made a significant contribution. With the percentage of validity of Ethnofun of 86% and student response questionnaire of 88.89%, it can be concluded that both methods have a fairly high level of validity. Based on the results of these validity, Abdal et al., (2023) explained that the percentage of validity *Ethnofun learning media*, has very valid criteria. This shows that ethnofun learning media and the use of questionnaires as evaluation tools are able to provide reliable results in measuring student understanding and response to learning material. Thus, take advantage of these findings to improve the effectiveness of the learning process, as well as optimize the achievement of learning objectives in the school. In addition, the results of this research can also be the basis for further development in improving the quality of learning in the school, so that it can have a positive impact on the academic and social development of. Ethnofun learning media can provide significant benefits in understanding the material of building space and increasing the computational thinking ability of students. With an interactive and fun approach, *Ethnofun* is able to visualize the concepts of building space more real and in-depth for students. *Ethnofun* uses local culture as a learning context. Culture makes it easier for students to understand the learning material because they are already familiar with the culture (Bahagia et al., 2022; Liesandra, 2022). In addition, through the use of this media, students are also invited to think computationally in solving various problems related to building space, such as predicting geometric patterns, identifying relationships between sides and angles, and developing problem-solving strategies. Thus, the use of ethnofun learning media not only helps students in conceptually understanding the material, but also encourages the development of higher-order thinking skills that are indispensable in this digital era.

2. Analysis of the Practicality of Ethnofun Learning Media

Testing the practicality of Ethnofun learning media was carried out through filling out a response questionnaire by students. In this research process, there are two stages of testing, namely limited trials and field tests. The results of filling out the response questionnaire by students in the limited trial reached a percentage of 86.26%, while at the field test stage the percentage increased to 86.94%. These two results show that the developed learning media has reached an adequate level of practicality, with a percentage of more than 75.01%, as explained by (Suganda et al. 2023). Meanwhile, according to the assessment of a mathematics teacher, this Ethnofun learning media is very suitable to be used in the learning process. The excellence of this media lies not only in providing new learning experiences for students, but also in the use of technology that is a special attraction for them. Interactive and fun learning media students tend to be more enthusiastic and motivated to learn. Previous research has shown that learning that involves media that encourages active participation tends to increase student engagement and information retention (Bintoro et al., 2021; Vitoria et al., 2021). In addition, Ethnofun media has succeeded in attracting students by presenting elements of local culture in learning, thus helping them to better understand and appreciate the cultural heritage around them. Thus, it can be concluded that Ethnofun learning media is not only practically effective, but also has a positive impact in enriching students' learning experience.

CONCLUSIONS

Based on the results of research that has been carried out, Ethnofun has been proven as a practical and valid learning medium in student CT. In terms of practicality, Ethnofun received a positive response from students, with a high participation rate in filling out response questionnaires, reaching more than 86% in limited trials and field tests. In addition, the use of Ethnofun has successfully contributed to the improvement of students' computational thinking (CT) skills. This improvement was measured using a specially designed CT assessment instrument that evaluated students' abilities in problem-solving, pattern recognition, abstraction, and algorithmic thinking. The instrument consisted of a series of tasks and questions aligned with key CT indicators, allowing for a comprehensive assessment of students' progress throughout the learning process. Through interaction with these media, students are encouraged to think critically, solve problems, and develop their computational skills. This is reflected in students' positive responses to the Ethnofun learning experience as well as their ability to complete tasks involving computational aspects. In addition, Ethnofun also contributes positively to improving the overall quality of learning. By presenting learning materials interactively and presenting elements of local culture, Ethnofun not only helps students develop their computational skills, but also increases a sense of pride and appreciation for local culture. Therefore, Ethnofun has great potential as a valuable tool in supporting students' CT development and improving the quality of learning in schools.

ACKNOWLEDGMENT

I would like to extend my sincere gratitude to Mrs. Dr. Swasti Maharani, M.Pd., and Mr. Dr. Edy Suprapto, S.Si., M.Pd., my supervisors, for their guidance, support, and invaluable insights throughout this research. I am also grateful to Universitas PGRI Madiun for providing the facilities and assistance necessary for this study. This research would not have been possible without their help and the encouragement from all those who supported me, directly and indirectly. Thank you for your contributions, which have played a crucial role in the success of this work. I hope the findings of this research will contribute to the advancement of science and education.

AUTHOR CONTRIBUTION STATEMENTS

HRR	:	Data Research and In-Depth Data Analysis
SM & ES	:	Overall Research Coordination, Data Analysis, Interpretation, Review and Editing.

REFERENCES

Abdal, N. M., Sulaiman, D. R. A., & Setialaksana, W. (2023). Pengembangan instrumen efikasi diri dalam matematika: studi validasi dengan analisis faktor eksploratori. *Jurnal MediaTIK*, *6*(2), 109–114. https://doi.org/10.26858/jmtik.v6i2.47007

Abdillah, F. M., Sulton, S., & Husna, A. (2021). Implementasi penilaian autentik dalam kurikulum 2013. *Jurnal Kajian Teknologi Pendidikan*, *4*(1), 41–50. https://doi.org/10.17977/um038v4i12021p041

Afgani, M. W. (2021). Pisa-like problems using islamic ethnomathematics approach. *Infinity Journal*, *10*(2), 203–216. https://doi.org/10.22460/infinity.v10i2.p203-216

Ambarwati, B. T., & Ekawati, R. (2022). Analisis literasi matematika siswa dalam menyelesaikan soal higher order thinking skills (HOTS) proporsi. *MATHEdunesa*, *11*(2), 390–403. https://doi.org/10.26740/mathedunesa.v11n2.p390-403

Angraini, L. M., Arcat, A., & Sohibun, S. (2022). Pengaruh bahan ajar berbasis multimedia interaktif terhadap kemampuan computational thinking matematis mahasiswa. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *6*(2), 370–383. https://doi.org/10.33603/jnpm.v6i2.6937

Anugrahana, A. (2018). Tinjauan deskriptif penerapan higher order thinking dan problem-based learning pada mata kuliah geometri berdasarkan kemampuan matematika mahasiswa. *Scholaria: Jurnal Pendidikan Dan Kebudayaan*, *8*(2), 142–156. https://doi.org/10.24246/j.js.2018.v8.i2.p142-156

As'ari, A. R., Kurniati, D., Maharani, S., & Basri, H. (2019). Ragam soal matematis untuk mengembangkan disposisi berpikir kritis. *Universitas Negeri Malang*.

Aulia, H., Habibi, M., & Risnawati, R. (2023). Mathematics literacy of grade 4 elementary school students in solving HOTS type mathematics problems. *Journal of Educational Sciences*, *7*(2), 256–268. https://doi.org/10.31258/jes.7.2.p.256-268

Ayni, M. N., Sari, A., & Fitraini, D. (2023). E-modul bercirikan etnomatematika pada materi bangun ruang sisi datar. *Suska Journal of Mathematics Education*, *9*(1), 83–94. https://doi.org/10.24014/sjme.v9i1.19021

Bahagia, B., Wibowo, R., Muniroh, L., Al-Wahid, A., Rizkal, R., & Noor, Z. M. (2022). Ethnomathematic value in traditional building in kampung budaya Bogor Jawa Barat. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *6*(2), 1659–1669. https://doi.org/10.31004/cendekia.v6i2.1387

Bintoro, H. S., Rahayu, R., & Murti, A. C. (2021). Design of ethnomathematics mobile module to facilitate students mathematical thinking ability. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *10*(4), 2362–2372. https://doi.org/10.24127/ajpm.v10i4.4169

Dharmayanti, N. M. D., Putra, I. N. A. J., & Paramartha, A. A. G. Y. (2021). Developing displayed flipbook as teaching material for assisting teacher to teach english in online learning for the fourth grade elementary school students. *Indonesian Journal of Educational Research and Review*, *4*(1), 113–121. https://doi.org/10.23887/ijerr.v4i1.35314

Erna, M., Elfizar, E., & Dewi, C. A. (2021). The development of e-worksheet using kvisoft flipbook maker software based on lesson study to improve teacher's critical thinking ability. *International Journal of Interactive Mobile Technologies (iJIM)*, *15*(01), 39–55. https://doi.org/10.3991/ijim.v15i01.15679

Hadi, F. R., & Maharani, S. (2022). Analysis of prospective elementary school teachers' inquisitiveness in solving mathematics problems. *QALAMUNA: Jurnal Pendidikan, Sosial, dan Agama*, *14*(2), 995–1010. https://doi.org/10.37680/qalamuna.v14i2.3854

Hidayah, I. R., Kusmayadi, T. A., & Fitriana, L. (2021). Minimum competency assessment (AKM): An effort to photograph numeracy. *Journal of Mathematics and Mathematics Education*, *11*(1), 14–20. https://doi.org/10.20961/jmme.v11i1.52742

Jumrah, J., Rukli, R., & Sulfasyah, S. (2023). Pengembangan instrumen tes berbasis HOTS dengan pendekatan pengukuran rasch pada pelajaran matematika topik bangun ruang untuk siswa Sekolah Dasar. *Jurnal Basicedu*, *7*(1), 11–27. https://doi.org/10.31004/basicedu.v7i1.4207

Kholid, M. N., Hamida, P. S., Pradana, L. N., & Maharani, S. (2020). Students 'critical thinking depends on their cognitive style. *International Journal of Scientific and Technology Research*, *9*(1), 1045–1049.

Liesandra, S. O. (2022). A Cultural Semiotics Study: Ethnomathematical exploration in geometry materials through cultural site in Aceh. *Jurnal Cakrawala Pendas*, *8*(3), 688–697. https://doi.org/10.31949/jcp.v8i3.2537

Maharani, S., Kholid, M. N., Pradana, L. N., & Nusantara, T. (2019). Problem solving in the context of computational thinking. *Infinity Journal*, *8*(2), 109–116. https://doi.org/10.22460/infinity.v8i2.p109-116

Munir, N. P. (2023). Algebra-ethnomathematics integrated E-modul for luwu culture with flipbook maker HTML 5 assisted application. *AIP Conference Proceedings*, *2805*(1). https://doi.org/10.1063/5.0149379

Prastiti, T. D., Tresnaningsih, S., Mairing, J. P., & Azkarahman, A. R. (2020). HOTS problem on function and probability: Does it impact to students' mathematical literacy in Universitas Terbuka? *Journal of Physics: Conference Series*, *1613*(1), 012003. https://doi.org/10.1088/1742-6596/1613/1/012003

Putri, N. L. P. D., & Astawan, I. G. (2022). E-LKPD interaktif dengan model *project-based learning* materi bangun ruang kelas V Sekolah Dasar. *Jurnal Pedagogi dan Pembelajaran*, *5*(2), 303–311. https://doi.org/10.23887/jp2.v5i2.47231

Rahadhian, L. N. R., Fajriah, N., & Suryaningsih, Y. (2022). Pengembangan modul pembelajaran flipbook pada materi aritmetika sosial berbasis etnomatematika pasar terapung. *EDU-MAT: Jurnal Pendidikan Matematika*, *10*(1), 55–64. https://doi.org/10.20527/edumat.v10i1.12939

Suganda, V. A., Toybah, T., & Hawa, S. (2023). Kepraktisan buku ajar berbasis higher order thinking skills (HOTS) pada mata kuliah pembelajaran matematika di sekolah dasar. *Jurnal Fundadikdas (Fundamental Pendidikan Dasar)*, *5*(3), 174–181. https://doi.org/10.12928/fundadikdas.v5i3.6850

Vitoria, L., Monawati, M., Fauzi, F., & Mislinawati, M. (2021). Assessing the effect of an ethnomathematics teaching material on students' understanding of mathematics. *JPP (Jurnal Pendidikan Dan Pembelajaran)*, *28*(1), 10–16. https://doi.org/10.17977/um047v27i12021p010

Wibowo, E., & Pratiwi, D. D. (2018). Pengembangan bahan ajar menggunakan aplikasi kvisoft flipbook maker materi himpunan. *Desimal: Jurnal Matematika*, *1*(2), 147–156. https://doi.org/10.24042/djm.v1i2.2279

Zaintika, N., Farida, N., & ES, Y. R. (2021). Pengembangan lembar kerja peserta didik (LKPD) bermuatan soal high order thingking skill (HOTS) Pada materi bangun ruang sisi datar kelas VIII SMP Negeri 9 Metro. *Jurnal Pendidikan Matematika Universitas Lampung*, *9*(4), 397–412. https://doi.org/10.23960/mtk/v9i4.pp397-412