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Cultural Perspectives in Geometry: Designing Ethnomathematics-Inspired Educational Tools for Geometric Thinking

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ABSTRAK

Penelitian ini bertujuan untuk mengembangkan bahan ajar berbasis etnomatematika guna meningkatkan keterampilan berpikir geometri siswa. Metode yang digunakan adalah model penelitian dan pengembangan dengan pendekatan 4D. Teknik analisis data meliputi penghitungan skor validitas dan kepraktisan melalui kuesioner. Hasil penelitian menunjukkan bahan ajar yang dikembangkan memiliki validitas rata-rata sebesar 85% dan kepraktisan rata-rata 90,5%, menandakan bahwa bahan ajar sangat valid dan sangat praktis digunakan dalam pembelajaran. Keberhasilan ini dicapai melalui integrasi konsep geometri dengan budaya lokal, sehingga pembelajaran menjadi lebih kontekstual, relevan, dan dapat meningkatkan motivasi siswa dalam belajar.

Kata Kunci: *Ethnomathematics;* Geometri; Pengembangan bahan ajar.

ABSTRACT

This research aims to develop ethnomathematics-based teaching materials to improve students' geometric thinking skills. The method used is a research and development model with a 4D approach. Data analysis techniques include calculating validity and practicality scores through questionnaires. The research results show that the teaching materials developed have an average validity of 85% and an average practicality of 90.5%, indicating that the teaching materials are very valid and very practical to use in learning. This success was achieved through integrating geometric concepts with local culture, so that learning becomes more contextual, relevant, and can increase student motivation in learning.

Keywords: *Ethnomathematics;* Geometry; Development of teaching materials.

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1. INTRODUCTION

Geometry is one of the important aspects of mathematics that helps students understand the concept of space and shape (Matos et al., 2024). And plays a role as a basis in various fields of science and daily life applications (Ariyana & Suastika, 2022). Understanding geometry is not only useful for developing logical thinking skills, but is also relevant in the context of art, architecture, and engineering (Atmaja, 2024). Therefore, the purpose of learning geometry in mathematics education should not only be limited to mastering concepts, but must also be able to be applied in everyday life (Pawartani et al., 2024). With this approach, students not only gain geometric knowledge, but also support other materials that enable them to read and interpret mathematical ideas better (Abdussakir, 2009; Afriansyah, 2022).

Geometric thinking skills in mathematics learning in junior high schools show that students often only know the formula without understanding the concept (Kania & Ratnawulan, 2022). Making students feel difficult and less enthusiastic in solving problems, both those with low, medium, and high levels of difficulty (Vivinenda & Setiawati, 2024). One of the abilities that teachers need to pay attention to is students' geometric thinking skills (Septia & Wahyu, 2023). In order for students to be able to follow the learning comfortably, it is important to provide examples that are relevant to everyday life, so that learning becomes more meaningful (Utami et al., 2018). One way to create fun learning is to integrate geometric concepts with culture (Febriyanti & Rahmawati, 2020).

Ethnomathematics is an approach that integrates mathematical concepts with local culture, so that students can see mathematics not only as a discipline, but also as part of their cultural identity (Rahman & Sinaga, 2024). In Indonesia, mathematical concepts are often applied in culture, such as batik patterns, traditional architecture, and carving designs (Alvianto & Setianingsih, 2024). By linking mathematics learning with culture, learning becomes more contextual and interesting (Hartanti & Ramlah, 2021a). Make students more enthusiastic and strengthen their sense of appreciation and preservation of cultural heritage (Setiyadi et al., 2024).

By integrating culture into geometry learning, students not only learn about local culture but are also trained to improve geometric thinking skills which are very important for developing analytical and problem-solving abilities (Sholihah & Afriansyah, 2017). One effective way to achieve this is to engage students in activities that require thinking, such as visualization, drawing, or modeling (Pertiwi, 2020). Through the Ethnomathematics approach, students can improve their geometric thinking skills while building confidence in answering math problems (Agusta, 2021). Thus, learning becomes more meaningful and relevant, helping students see the connection between mathematics and their culture (Ardiyanti et al., 2024).

Table 1. Relevant Research

Number	Title	Writer
1	Pengembangan Bahan Ajar Matematika Berbasis Etnomatematika pada Materi Geometri Transformasi	(Nurmaya et al., 2021)
2	Pengembangan Bahan Ajar Etnomatematika Bernuansa Rumah Adat Provinsi Banten Pada Sekolah Dasar	(Oktaviana et al., 2023)
3	Pengembangan Bahan Ajar Berbasis Etnomatematika Ukir Kayu Jepara Pada Materi Transformasi Geometri Kelas IX SMP/MTs	(Putri, 2022)
4	Bahan Ajar Transformasi Geometri Berbasis Discovery Learning melalui Pendekatan Etnomatematika	(Fitriyah et al., 2018)

Table 1 contains relevant research on the development of ethnomathematics-based teaching materials for Geometry material. One of the shortcomings of previous studies is the limitations of the methodology used. The explanation of the steps in the 4-D model (Define, Design, Develop) in previous studies is not detailed enough (Oktaviana et al., 2023). In addition, the explanation of the validation used by the validator for the assessment is not explained in detail, making it difficult for readers to understand the validity scores given (Nurmaya et al., 2021). There is a lack of discussion of the context of teaching materials on how local culture, such as Jepara wood carvings, can be integrated more deeply into learning (Putri, 2022). Research (Fitriyah et al., 2018) does not provide an in-depth analysis of student learning outcomes and how teaching materials affect their understanding.

To complement previous research, this study was conducted with the aim of developing ethnomathematics-based teaching materials to improve geometric thinking skills, with a focus on the level of validity and practicality tests. The novelty of this study lies in the architecture of buildings that have flat shapes on mosque ornaments, which have not been widely studied before. To achieve the objectives of this study, the steps taken include integrating the concept of flat shapes with local culture and compiling interesting materials so that students feel happy in the learning process. Thus, it is hoped that this study can significantly increase student involvement and understanding in learning mathematics.

2. METHOD

This research method uses a research and development research model abbreviated as (R&D) or development research. The R&D method is a research method that produces innovations in a new product or develops existing products to be more attractive according to the needs in the field. This researcher uses the 4D Model reference consisting of four stages, namely the Define (definition), Design (design), Development (development) and Disseminate (dissemination) stages (Oktaviana et al., 2023), which can be seen in Figure 1 below.

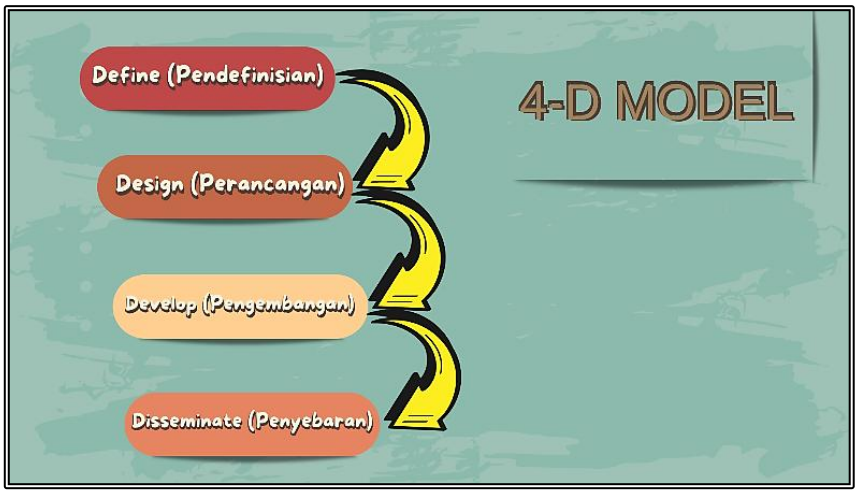

Figure 1. 4-D Development Concept

The subjects of the study were teachers and students of Junior High Schools (SMP). This study was conducted at one of the SMPN schools in Majalengka Regency on Friday, October 25, 2024. The data collection technique used in this study was to conduct initial observations by interviewing mathematics subject teachers to find out students' learning resources. As well as providing diagnostic tests to grade VIII students. Development in this study involved assessments from the validator team, teachers, and students. The products produced were ethnomathematics teaching materials with nuances of mosque ornaments in Majalengka Regency, West Java.

In analyzing the validation sheet instrument data, the researcher used a four-scale Likert scale scoring rule with the criteria of Invalid, Less Valid, Valid, and Very Valid. Table 2 shows the assessment criteria by the material expert validator and the learning media development expert.

Table 2. Validity Criteria for Materials and Media

Number	Validity Criteria	Validity Level
1	$85\% < \mathrm{V} \leq 100\%$	Very Valid
2	$70\% < \mathrm{V} \leq 85\%$	Valid
3	$50\% < \mathrm{V} \leq 70\%$	Less Valid
4	$\mathrm{V} \leq 50\%$	Not Valid

Source: (Nesri & Kristanto, 2020)

According to (Nesri & Kristanto, 2020) The scores obtained based on expert assessments are then converted into percentages. After obtaining the data, the data needs to be analyzed. The data analysis used is to calculate the valid scale. According to (Akbar, 2013) determining the value (%) of the validity criteria can use the following formula:

$$V = \frac{TSe}{TSh} \times 100\%$$

With V is the percentage of validity of the teaching materials, TSe is the number of scores given by the expert validator's assessment, and TSh is the maximum number of scores. In the practicality sheet, it is obtained based on the results of the teacher and student response

questionnaires. The results of the questionnaire were measured using a five-scale Likert scale, namely Very Practical, Practical, Less Practical, Not Practical, and Very Not Practical. The results that have been known are then grouped into the criteria for the practicality of teaching materials according to table 3.

Table 3. Practicality Criteria for Teaching Materials

Number	Practicality Criteria	Validity Level
1	$80\% < P \leq 100\%$	Very Practical
2	$60\% < P \leq 80\%$	Practical
3	$40\% < P \leq 60\%$	Less practical
4	$20\% < P \leq 40\%$	Not practical
5	$0 < P \leq 20\%$	Very Impractical

Source: (Nesri & Kristanto, 2020)

According to (Nesri & Kristanto, 2020) the scores obtained based on expert assessments are then converted into percentages. The data analysis used is to calculate the practical scale. According to (Riduwan dan Akdon, 2013) the formula for managing data per group is as follows:

$$P = \frac{\sum x}{\sum xi} \times 100\%$$

Formula for calculating the average:

$$\text{Average calculation formula} = \frac{\text{percentage}}{\text{amount of data}}$$

Where P is the percentage of module practicality, $\sum x$ is the sum of scores given by teachers and students, and $\sum xi$ is the sum of maximum scores from teachers and students.

3. RESULT AND DISCUSSION

a. Result

The results of the research and development carried out are teaching materials on flat building materials based on ethnomathematics to improve geometric thinking skills. The development of this teaching material uses a 4D development model that is limited to the development stage with the results in each stage as follows.

1) Define

In the Define stage, researchers conducted observations at schools to collect information by giving tests and interviews to students and mathematics teachers. Information from the results of the observations was analyzed related to student difficulties, learning resources, curriculum until an analysis of student needs was obtained. The activities carried out refer to the geometric thinking indicators according to Pierre Van Hiele (Renanda et al., 2023; Tarlina & Madawistama, 2024).

Table 4. Geometric thinking indicators according to Pierre Van Hiele

Number	Stage	Indicator
1	Visualization (Level 0)	Students only understand the shape of flat shapes based on what they see.
2	Analysis (Level 1)	Students begin to recognize the properties of flat shapes based on their shape.
3	Sorting (Level 2)	Students begin to understand the relationship between the properties of plane geometric shapes.
4	Formal Deduction (Level 3)	Students begin to understand formal logic and deduction in plane figures.
5	Rigor (Level 4)	Students can understand formal theorem proof and the relationship between various axiomatic systems.

From the results of observations through observation tests, students have not been able to understand the problems given regarding the material on flat shapes. Each student has a different level of problem solving. One of the difficulties students have is understanding the relationship between the properties of flat shapes. After conducting the test, the researcher conducted interviews with students and teachers. The results showed that the learning resources used were independent curriculum books. Students do not have textbooks as a reference. This makes students look for as much additional information as possible from other sources that can be searched, one of which is from the internet. In fact, the limitations of these learning resources affect student learning outcomes (Agrestian & Nurhikmayati, 2024).

The results of the interview showed that previous learning used the lecture method. The material presented was not linked to contextual concepts that students often encounter. With this condition, students are less active in learning. Then a curriculum analysis was carried out so that the direction of the development of this Teaching Material was clear. This analysis was carried out by collecting information from teachers regarding learning outcomes (CP), learning objectives (TP), and learning objective flows (ATP) that were appropriate for flat building material. Based on the results of the analysis, the researcher created teaching materials related to the culture that students often find in real life. One of them is related to the architectural ornaments of the mosque. Which is expected to be able to make students improve their learning achievements at school (Lubis & Nuriadin, 2022).

2) Design

This stage aims to design learning devices that are associated with ethnomathematics with nuances of mosque ornaments. By integrating mathematical and cultural concepts, it is hoped that students will be interested in learning later. The selection of materials and imagination is very necessary in designing this teaching material. The following are the components contained in the teaching material table 5.

Table 5. Components of Teaching Materials

Teaching Material Components	Category	Description
Cover	Support	Displays the title, academic year, phase, compiler and pictures or illustrations of mosque ornaments.
Foreword	Support	Explaining the context, objectives, methods, and acknowledgments for support in preparing the material.
List of contents	Support	Contains chapter titles, sub-chapters, and pages on which each section is located to make it easier to find the material you want to find.
Instructions for use	Support	Contains step-by-step instructions for using teaching materials, from how to access the material to doing exercises.
Learning Outcomes	Core	Contains competencies that students must achieve at each phase of their development.
Learning objectives	Core	This section explains what students are expected to achieve after participating in the learning.
Learning Objectives Flow	Core	Contains systematic steps followed to formulate and achieve learning objectives.
Geometric Thinking Skills Indicators	Core	The skills that students must have in understanding and applying geometric concepts.
Concept maps	Support	Covers major topics, related subconcepts, and relationships between concepts that explain the digestive system in a structured manner.

The cover of the teaching material is shown in Figure 2 which displays the title, academic year, phase, compiler and pictures or illustrations. This cover aims to attract students' attention and provide an initial overview of the material to be studied.

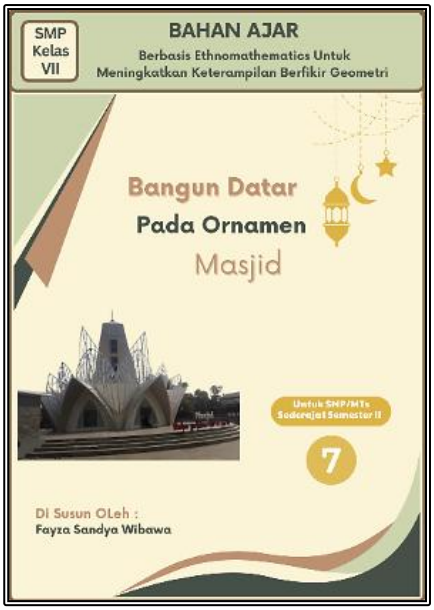

Figure 2. Cover of Teaching Materials

Based on the components of the teaching materials above, the important elements that form an effective and structured learning material. By integrating all these components, teaching materials are expected to create a more effective and meaningful learning experience (Hehakaya & Pollatu, 2022). Therefore, this study will develop ethnomathematics-based teaching materials to improve geometric thinking skills.

3) Develop

The activities in this stage aim to create a final version of a better learning tool (Hamidi, 2013). By creating a cultural-themed teaching material product on mosque ornaments, the development of this teaching material is to improve geometry skills. Activities regarding this stage can be seen as follows.

Figure 3. Understanding Flat Shapes

Based on Figure 3, the activities carried out by students are only understanding a mosque architecture to the shape of a flat shape based on what they see. By referring to the Visualization Stage indicator (level 0), the steps taken by students in understanding the shape of a flat shape. Students first look for a picture fragment that contains a flat shape. After getting a flat shape fragment, students determine the shape of the flat shape and the name of the flat shape based on what has been obtained.

Figure 4. Recognizing the Properties of Planar Shapes

Based on Figure 4, the activities carried out by students begin to recognize the properties of flat shapes based on their shapes. By referring to the Analysis Stage indicator (level 1), the steps taken by students in recognizing the properties of flat shapes. Students first know what is meant by the shape of a flat shape. After knowing the shape of the flat shape, students check the column if it meets and cross it out if it does not meet the column of the properties of the flat shape in the teaching material table based on the shape of the flat shape.

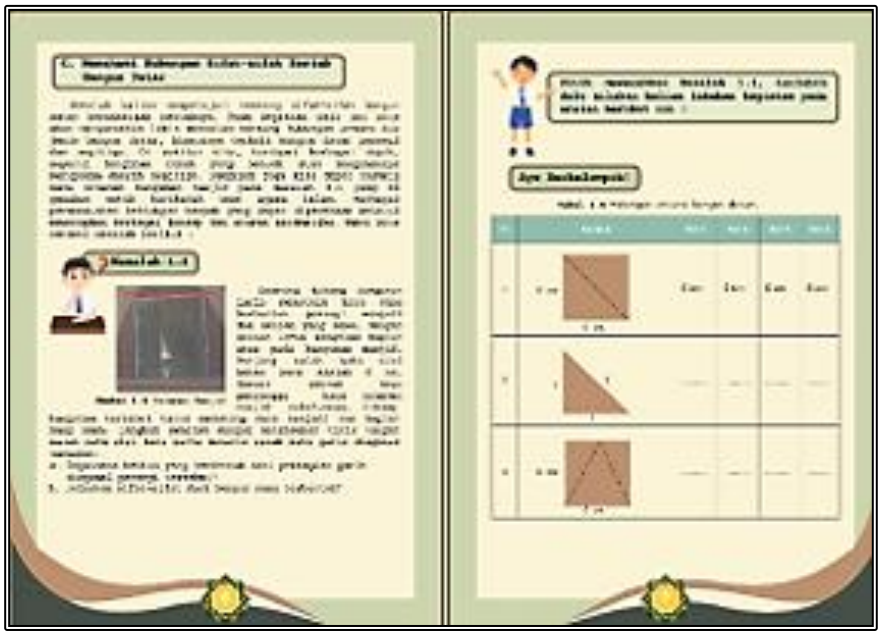

Figure 5. Understanding the Relationship Between the Properties of Plane Shapes

Based on Figure 5, the activities carried out by students begin to understand the relationship between the properties of flat shapes. By referring to the Sequencing Stage indicator (level 2), the steps taken by students in understanding the relationship between the properties of flat shapes. Students are given contextual problems first. After being given the problem, students are given instructions to solve the problem. By filling in the columns in the teaching materials table, students will indirectly understand the relationship between the properties of square and triangle flat shapes.

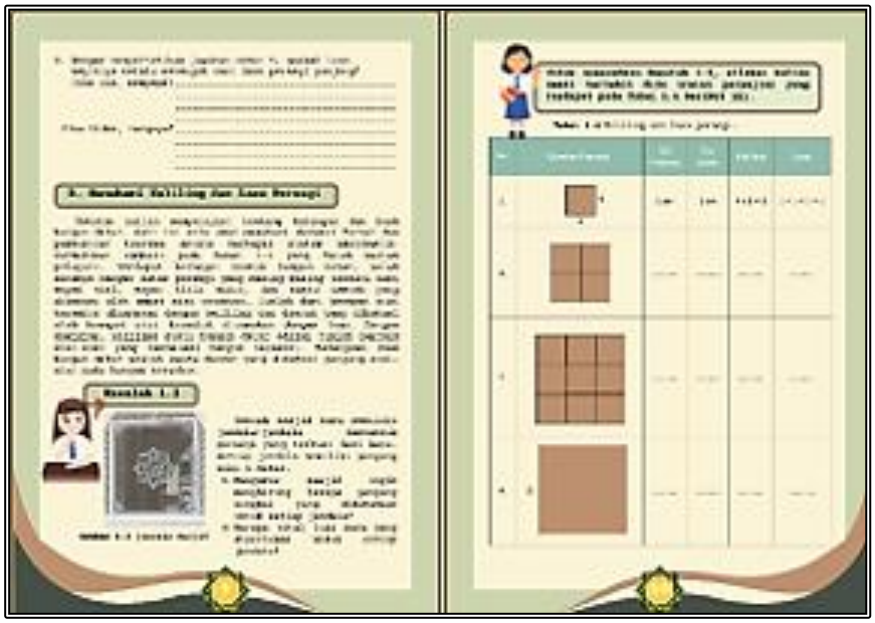

Figure 6. Understanding the Circumference and Area of a Square

Based on Figure 6, the activities carried out by students begin to understand the circumference and area of a square. Referring to the Formal Deduction Stage (level 3) and Rigor Stage (level 4) indicators. The steps taken by students in understanding the circumference and area of a square, students are given contextual problems first. After being given a problem, students are given instructions to solve the problem. By filling in the columns in the student teaching material table, by following the instructions in the table, students are expected to be able to calculate the circumference and area of a square. And can prove the circumference formula and the area formula for a square.

Based on the development of teaching materials that have been carried out, a teaching material in the form of a book was obtained using B5 paper. The teaching materials made in this study are based on an ethnomathematics (cultural) approach related to the materials and cultures used that are often encountered by students, one of which is a mosque in Majalengka district. Before obtaining the final teaching materials, validity and practicality were carried out. The validity of the teaching material expert was assessed by 1 validator who is an expert in the field of Mathematics material, this assessment is in the form of

comments and suggestions on the teaching materials produced, the results of the validator are seen in Table 6.

Table 6. Recapitulation of Material Expert Validation

Item Number	Subject Matter Expert	Percentage	Information
1	4	80	Fulfil
2	4	80	Fulfil
3	3	60	Enough
4	4	80	Fulfil
5	4	80	Fulfil
6	4	80	Fulfil
7	3	60	Enough
8	4	80	Fulfil
9	4	80	Fulfil
10	3	60	Enough
11	4	80	Fulfil
Amount	41	820	Worth using with revision

The validity of the media expert in developing teaching materials produced was assessed by 1 validator who is an expert in the field of media development of ethnomathematics-based teaching materials to improve geometric thinking skills. This assessment is in the form of comments and suggestions on the teaching materials produced. The results from the validator are in Table 7.

Table 7. Recapitulation of Validation by Mathematical Media Experts

Item Number	Media Expert	Percentage	Information
1	4	80	Fulfil
2	3	60	Enough
3	5	100	Very Satisfying
4	5	100	Very Satisfying
5	3	60	Enough
6	4	80	Fulfil
7	4	80	Fulfil
8	4	80	Fulfil
9	4	80	Fulfil
10	5	100	Very Satisfying
11	4	80	Fulfil
12	5	100	Very Satisfying
13	4	80	Fulfil
14	5	100	Very Satisfying
15	5	100	Very Satisfying
16	5	100	Very Satisfying

Item Number	Media Expert	Percentage	Information
Amount	69	1380	Worth using with revision

Teacher Practicality Sheet, the teaching materials produced are assessed by 1 teacher to determine the practicality of the teaching materials. This assessment is in the form of comments and suggestions on the teaching materials produced, the results are in table 8.

Table 8. Recapitulation of Teacher Practicality

Item Number	Teacher	Percentage	Information
1	5	100	Very Satisfying
2	5	100	Very Satisfying
3	5	100	Very Satisfying
4	5	100	Very Satisfying
5	5	100	Very Satisfying
6	5	100	Very Satisfying
7	4	80	Fulfil
8	5	100	Very Satisfying
9	5	100	Very Satisfying
10	5	100	Very Satisfying
11	5	100	Very Satisfying
12	5	100	Very Satisfying
13	5	100	Very Satisfying
14	5	100	Very Satisfying
Amount	69	1380	Worth using with revision

Student Practicality Sheet, the teaching materials produced are assessed by 3 students. This assessment is in the form of comments and suggestions on the teaching materials produced in Table 9.

Table 9. Recapitulation of Student Practicality

Item Number	S1	S2	S3	Amount	Percentage	Information
1	4	4	5	13	87	Very Satisfying
2	4	5	4	13	87	Very Satisfying
3	4	5	5	14	94	Very Satisfying
4	5	4	5	14	94	Very Satisfying
5	5	4	5	14	94	Very Satisfying
6	4	5	5	14	94	Very Satisfying
7	5	5	4	14	94	Very Satisfying
8	3	4	3	10	67	Enough
9	5	3	4	12	80	Very Satisfying
10	4	5	5	14	94	Very Satisfying

Item Number	S1	S2	S3	Amount	Percentage	Information
11	5	5	4	14	94	Very Satisfying
12	4	4	5	13	87	Very Satisfying
Amount	52	53	54	159	1066	Worth using with revision

Description: S1= Student 1, S2= Student 2, S3= Student 3

b. Discussion

The development of Ethnomathematics-based teaching materials to improve geometric thinking skills, in this study has high validity and practicality. The teaching materials obtained an average score of 85% indicating that the teaching materials meet the criteria for materials that are in accordance with the curriculum and are relevant to the needs of students which are stated to be very valid (Nesri & Kristanto, 2020). In line with previous findings which state that valid teaching materials can improve the quality of learning (Nurmaya et al., 2021).

The practicality of the teaching materials obtained an average score of 90.5% indicating that the teaching materials are very practical to use by teachers and students (Nesri & Kristanto, 2020). This result has increased by 6% from previous research by (Nurmaya et al., 2021). Teachers and students gave a very good response to the teaching materials developed. Positive student responses indicate the interest and feelings of pleasure felt by students (Suryadinata, 2015).

The results of this study indicate that the development of ethnomathematics-based teaching materials can effectively improve students' geometric thinking skills. Achieved through the integration of geometric concepts with local culture, which makes learning more contextual and relevant (Siregar et al., 2024). Learning that links mathematics with local culture provides more meaning for students, thus encouraging to be more active and enthusiastic in learning (Fatimah et al., 2024).

This approach is in line with constructivism theory, which emphasizes the importance of experience and context in learning. According to Piaget and Vygotsky, students build new knowledge by linking it to existing experiences (Andrea et al., 2024; Khoiruzzadi & Prasetya, 2021). By integrating local culture, students can link geometric concepts to their everyday reality, making the learning process more meaningful (Lestari et al., 2024).

This study also supports previous findings by (Hartanti & Ramlah, 2021b), which states that contextual mathematics learning can improve students' motivation and learning outcomes. When students see the relevance of mathematical concepts in everyday life, they tend to be more motivated to learn and understand the material (Yolanda et al., 2024). This study also has the potential to change the paradigm of mathematics learning in the future. By adopting an ethnomathematics approach, mathematics education can become more inclusive and reflective

of cultural diversity. This can not only improve students' academic achievement but also their appreciation for local culture (Miranti et al., 2024).

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Further research can be conducted to explore the application of this approach in a broader context, as well as to analyze its impact on mathematics learning at various levels of education. Thus, the development of ethnomathematics-based teaching materials not only contributes to the improvement of geometric thinking skills, but can also bring about positive changes in the way mathematics is taught and understood by future generations.

4. CONCLUSION

This study aims to develop ethnomathematics teaching materials to improve students' geometric thinking skills. The results show that the integration of geometry with local culture, such as mosque ornaments, increases the validity (85%) and practicality (90.5%) of the teaching materials, making them more contextual and relevant. The contribution of this study is to emphasize the importance of the ethnomathematics approach in mathematics education, which can improve students' motivation and understanding. By integrating culture, students learn geometric concepts while appreciating cultural heritage, in accordance with the theory of constructivism that emphasizes the context of learning. For further development, it is recommended to explore the application of this approach at various levels of education. Further studies can also analyze the long-term impact of ethnomathematics teaching materials on students' academic achievement and attitudes. This study has the potential to bring positive changes in mathematics teaching and enrich the literature on mathematics education that is inclusive and reflective of cultural diversity.

BIBLIOGRAPHY

Agrestian, R., & Nurhikmayati, I. (2024). Pengembangan Alat Peraga Valorem Fractus untuk Meningkatkan Pemahaman Konsep Siswa pada Materi Pecahan Senilai. *Papanda Journal of Mathematics and Science Research*, *3*(1). https://doi.org/10.56916/pjmsr.v3i1.750

Agusta, E. S. (2021). Pembelajaran Etnomatematika Pada Budaya Betawi Untuk Meningkatkan Aktivitas dan Kreativitas Siswa Pada Materi Transformasi Geometri. *Jurnal Lingkar Mutu Pendidikan*, *18*(1), 53 – 67. https://doi.org/10.54124/jlmp.v18i1.7

Alvianto, A. L., & Setianingsih, R. (2024). Eksplorasi Etnomatematika Pada Peninggalan Sejarah Dan Budaya Sumenep. *MATHEdunesa*, *13*(1), 234 – 254. https://doi.org/10.26740/mathedunesa.v13n1.p234-254

Andrea, J., Sakinah, F., Gistituat, N., & Hardiyantot. (2024). *7158 Merdeka Belajar Dalam Revolusi Pendidikan Indonesia di Era Disrupsi*.

Ardiyanti, B., Choirudin, C., & Ningsih, E. F. (2024). Etnomatematika Bangunan Pionering Pramuka terhadap Minat dan Kreativitas Siswa. *Jurnal Penelitian Tindakan Kelas*, *1*(3), 156 – 161. https://doi.org/10.61650/jptk.v1i3.509

Atmaja, I.M.D. (2024). *Prosiding MAHASENDIKA III Tahun 2024 Logika Berpikir Manusia Dalam Konteks Etnomatematika Dan Konsep Matematika*.

Fatimah, N., Setiawati, E., Suharto, T. H., Kunci, K., Datar, B., Banjar, B., & Dasar, S. (2024). Integrasi Etnomatematika Budaya Banjar dalam Pembelajaran Bangun Datar untuk Siswa Kelas 2 SD. *JPI: Jurnal Pendidikan Indonesia, 4*(6).

Febriyanti, I., & Rahmawati, I. (2020). Eksplorasi Geometri Pada Candi Bajang Ratu Sebagai Implementasi Etnomatematika Di Sekolah Dasar. *Jurnal Penelitian Pendidikan Guru Sekolah Dasar, 8*(3).

Fitriyah, D. N., Santoso, H., & Suryadinata, N. (2018). Bahan Ajar Transformasi Geometri Berbasis Discovery Learning melalui Pendekatan Etnomatematika. *Jurnal Elemen*, *4*(2), 145 – 158. https://doi.org/10.29408/jel.v4i2.705

Hartanti, S., & Ramlah, R. (2021a). Etnomatematika: Melestarikan Kesenian dengan Pembelajaraan Matematika. *Ideas: Jurnal Pendidikan, Sosial, Dan Budaya*, *7*(2), 33. https://doi.org/10.32884/ideas.v7i2.347

Hehakaya, E., & Pollatu, D. (2022). Problematika Guru Dalam Mengimplementasikan Kurikulum Merdeka. *Didaxei, 3*(2).

Kania, N., & Ratnawulan, N. (2022). Kompetensi matematika: Kemampuan pemecahan masalah matematis siswa menurut-polya. *Journal of Research in Science and Mathematics Education, 1*(1)

Khoiruzzadi, M., & Prasetya, T. (2021). Perkembangan Kognitif Dan Implikasinya Dalam Dunia Pendidikan (Ditinjau dari Pemikiran Jean Piaget dan Vygotsky). *Jurnal Madaniyah*, *11*.

Lestari, S. A. P., Kusumaningrum, D. S., & Nurapriani, F. (2024). Integrasi Etnomatematika dalam Pembelajaran Bangun Datar Segi Empat Berbasis Kearifan Lokal untuk Meningkatkan Pemahaman Matematika. *Jurnal Inovasi Penelitian Dan Pengabdian Masyarakat*, *4*(2), 161 – 171. https://doi.org/10.53621/jippmas.v4i2.369

Lubis, A. P., & Nuriadin, I. (2022). Efektivitas Aplikasi Wordwall untuk Meningkatkan Hasil Belajar Siswa dalam Pembelajaran Matematika Sekolah Dasar. *Jurnal Basicedu*, *6*(4), 6884 – 6892. https://doi.org/10.31004/basicedu.v6i4.3400

Matos, G. A., & Agetta, M. Y., Khowiyah. (2024). *Persepsi Kesulitan Belajar Matematika Geometri Bangun Ruang Di Sekolah Dasar*. *7*. *Sindoro: Cendikia Pendidikan, 7*(12).

Miranti, M., Mukodas, M., & Anwar, M. (2024). Representasi Budaya dalam Materi Pembelajaran Bahasa Indonesia Kurikulum Merdeka Tingkat SMA. *Asatiza: Jurnal Pendidikan*, *5*(2), 233 – 245. https://doi.org/10.46963/asatiza.v5i2.1866

Nesri, F. D. P., & Kristanto, Y. D. (2020). Pengembangan Modul Ajar Berbantuan Teknologi untuk Mengembangkan Kecakapan Abad 21 Siswa. *AKSIOMA: Jurnal Program Studi Pendidikan Matematika*, *9*(3), 480. https://doi.org/10.24127/ajpm.v9i3.2925

Nurmaya, R., Herawati, R., & Ratnaningsih, N. (2021). Pengembangan Bahan Ajar Berbasis Etnomatematika Pada Materi Transformasi Geometri. *Jurnal Pendidikan Matematika*, *2*(2).

Oktaviana, E.B.N., Setiyadi, D., & Siregar, F. (2023). Pengembangan Bahan Ajar Etnomatematika Bernuansa Rumah Adat Provinsi Banten Pada Sekolah Dasar. *Jurnal Elementaria Edukasia*, *6*(4), 1835 – 1845. https://doi.org/10.31949/jee.v6i4.7195

Pawartani, T, Suyono, & Rufiana, I.S. (2024). Merajut Bahasa, Seni, Dan Numerasi Melalui Pengembangan Cerita Bergambar. *Pendas: Jurnal Ilmiah Pendidikan Dasar, 9*(2).

Pertiwi, A. (2020). Konsep Informatika Dan Computational Thinking Di Dalam Kurikulum Sekolah Dasar, Menengah, Dan Atas. *Abdimasku: Jurnal Pengabdian Masyarakat*, *3*(3), 146. https://doi.org/10.33633/ja.v3i3.53

Putri, F. M. (2022). Pengembangan Bahan Ajar Berbasis Etnomatematika Ukir Kayu Jepara Pada Materi Transformasi Geometri Kelas IX SMP/MTs. PEMANTIK: *Jurnal Pembelajaran Dan Pengembangan Matematika*, *2*(1).

Rahman, B., & Margaretha Sinaga, R. (2024). Penanaman Nilai Keindonesiaan Dalam Pendidikan Melalui Media Pembelajaran Digital: Etnomatematika Dalam Gerakan Tari Sigeh Penguten. *JPGMI*, *10*(2).

Renanda, A., Qohar, Abd., & Chandra, T. D. (2023). Analisis Peningkatan Level Berpikir Geometri Mahasiswa Berdasarkan Teori Van Hiele dengan Pendekatan Konstruktivisme. *Jurnal Tadris Matematika*, *6*(1), 101 – 114. https://doi.org/10.21274/jtm.2023.6.1.101-114

Septia, T., & Wahyu, R. (2023). Literasi Digital Peserta Didik Dalam Pembelajaran Geometri Terintegrasi Geogebra. *Plusminus: Jurnal Pendidikan Matematika*, *3*(1), 51 – 60. https://doi.org/10.31980/plusminus.v3i1.1222

Setiyadi, D., Hartono, Rokhman, F., & Wagiran. (2024). Menjaga Tradisi Lewat Tari: Eksplorasi Seni Lengger Banyumasan Sebagai Ekstrakurikuler di Sekolah Dasar. *JTIEE: Journal of Teaching in Elementary Education, 8*(2).

Sholihah, S. Z., & Afriansyah, E.A. (2017). Analisis Kesulitan Siswa Dalam Proses Pemecahan Masalah Geometri Berdasarkan Tahapan Berpikir Van Hiele. *Mosharafa: Jurnal Pendidikan matematika, 6*(2).

Siregar, T. J., Br Ginting, S. S., & Nasution, H. A. G. (2024). Pengembangan Bahan Ajar Mata Kuliah Geometri Transformasi Berbasis Budaya Sumatera Utara. *Teorema: Teori Dan Riset Matematika*, *9*(2), 233. https://doi.org/10.25157/teorema.v9i2.15644

Tarlina, Y., & Madawistama, S. (2024). Analisis Struktur Berpikir Geometri Berdasarkan Teori Van Hiele Dalam Menyelesaikan Soal Open Ended Matematika Ditinjau Dari Gaya Kognitif Visualizer. *Jurnal Pendidikan Dan Pembelajaran Matematika Indonesia*, *13*(2).

Vivinenda, N., & Setiawati, D. (2024). Penerapan Layanan Bimbingan Kelompok Dengan Teknik Self-Regulated Learning Untuk Meningkatkan Regulasi Emosi Siswa Smpn 1 Sooko Mojokerto. *Jurnal BK UNESA, 14*(3).

Yolanda, A., Sihotang, M., Zebua, J. A., Hutasoit, M., & Sinaga, Y.L. (2024). Strategi Pembelajaran Kontekstual untuk Meningkatkan Pemahaman Konsep Siswa Sekolah Dasar. *Pragmatik: Jurnal Rumpun Ilmu Bahasa Dan Pendidikan*, *2*(3), 301 – 308. https://doi.org/10.61132/pragmatik.v2i3.941

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