Integrating Ethnomathematics and Make-a-Match Model into Geometry Teaching Material Development

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ABSTRACT

Introducing traditional culture through mathematics while contextualizing Math in ethnic elements is the innovative idea of ethnomathematics. This study applied the idea in developing Geometry teaching materials using the Ethnomathematics approach and Make-a-Match models. This research and development employed the ADDIE model (Analysis, Design, Development, Implementation, and Evaluation). The subjects were 24 students of Grade 8 in a junior high school. The instruments utilized in this research included validation sheets, questionnaires, observation, and pretest-posttest. This research yielded teaching material in the form of students' worksheets (LKPD) that achieves the criteria of being valid, practical, and effective.

Keywords:
Teaching materials; Ethnomathematics; Make-a-Match; Geometry

INTRODUCTION

Teaching Mathematics needs to involve ways of thinking to effectively convey the objectives and concepts of mathematics. This complexity necessitates educators exert more effort to enhance students' understanding and address their learning difficulties. To address those problems, teachers can employ several methods, including developing teaching materials (Atikurrahman et al., 2019; Fitriyah et al., 2018; Hasanah, 2020; Tohir et al., 2021). According to (Rezat et al., 2021; R. E. Utami et al., 2018), adequate teaching material should align with students' characteristics and social environment to ensure it aligns with the curriculum. The materials must also meet criteria such as simplicity, clarity, ease of understanding, ease of development, and relevance to real-life situations (Aydin & Aytekin, 2018; Magdalena et al., 2020). These criteria serve as guidance for teachers to develop teaching materials continuously. Consequently, research on the development of mathematics teaching materials is still worth further exploring to enhance the quality of mathematics learning.

Since the national curriculum transitioned into the Merdeka curriculum, educators have had more extensive opportunities to develop teaching materials. Nevertheless, initial observations of teachers and students at SMP Negeri 1 Arjasa, Situbondo, indicated that the teaching materials in the form of Worksheets (LKPD) for Geometry were still overly simplistic, with unclear problem items that were difficult for students to comprehend. Many students still struggled with geometric problem-solving, resulting in difficulties in completing assignments and obtaining low scores in mathematics assessments. It contradicts the assertion by (İnan & Erkuş, 2017) that worksheets should be well-prepared according to students' needs and abilities in order to enhance their understanding. Furthermore, the observation revealed that the instructional materials and worksheets fail to connect mathematics with students' daily lives or real-world experiences as their prior knowledge. As noted by (Machaba & Dhlamini, 2021), this deficiency may lead to low student performance in Mathematics learning process. Hence, the need for engaging teaching materials that link mathematical concepts, particularly geometry, with real-world contexts forms the foundation for developing mathematics worksheet materials of this current study.

An approach that can be utilized to connect mathematics with real life is ethnomathematics. It integrates mathematical concepts with ethnic and cultural elements, such as Traditional houses, attires, local culinary foods, musical instruments, cultural artifacts, and other traditional elements. It was developed by

a Brazilian scholar, D'Ambrosio (1977), who dedicated his life to Ethnomathematics advancement (Rosa et al., 2016). Incorporating local ethnic elements into mathematics increases engagement and motivation to learn, makes the instructional process more interactive, and improves students' understanding of Mathematics (A. Utami, 2023). This approach has been extensively researched in various countries, focusing on their respective cultures; for instance, (Machaba & Dhlamini, 2021) studied Ethnomathematics in African cultures (Meaney et al., 2021) in the Maori tribe of New Zealand (Meaney, 2021) and (Sunzuma & Maharaj, 2022) on the perspectives of in-service teachers in Zimbabwe.

Particularly in Indonesia, with its immense diversity of ethnic cultures, ethnomathematics is highly suitable for implementation by selecting ethnic topics that are most relevant and familiar to local cultures (Darwis Abroriy, 2020). Hence, (Deda et al., 2024) found Indonesia with the most extensive research on this topic. One of them is Widada (2018), who investigated ethnomathematics within Bengkulu's culture. Moreover, (Ayuningtyas & Setiana, 2019) studied ethnomathematics in the culture of Yogyakarta, (Prahmana & D'Ambrosio, 2020) in the motifs of Batik and Indonesian shadow puppets, and (Darwis Abroriy, 2020) on the Madura tribe. Indeed, many more cultures can be explored through mathematics, making this subject simultaneously play a role in introducing local cultures so that students can develop an appreciation for the cultural diversity of Indonesia.

In addition to exploring culture, researchers also test ethnomathematics' effectiveness on students' specific capabilities and particular mathematical topics. This approach has proven effective, especially for problem-solving (Kharisma & Asman, 2018; Lubis et al., 2021; A. Utami, 2023), achievement (Erva et al., 2022; Machaba & Dhlamini, 2021), and performance (Meaney et al., 2021). Regarding the subject matter, ethnomathematics has been proven to be a suitable method for algebra, trigonometry (Zhang & Zhang, 2010), and geometry (Nurmaya, 2021; Zhang & Zhang, 2010). Therefore, ethnomathematics is appropriate for this research, as the developed material focuses on geometry with problem-solving tasks.

Most previous studies suggest that developing ethnomathematics using diverse and applicable teaching strategies or models makes teaching materials more engaging and learning activities more enjoyable. The selection of a learning model needs to be tailored to the characteristics of students and the social environment (Fitriatien t.t., 2016). An appropriate model is "Make-a-Match," which was first developed by Lorns Curran in 1994. It is a cooperative learning model, typically in a card game (Malikah & Widhiasti, 2019). Previous research has found that this learning model can enhance students' cognitive abilities (Maulidawati et al., 2020), critical thinking (Permatasari, 2020), and achievement (Fauhah & Rosy, 2020; Juliani et al., 2021; Mare & Malik, 2023; Ulya & Rahayu, 2017). If the Make-a-Match learning model is combined with ethnomathematics, the instructional materials will become highly engaging with various images that need to be matched with geometric patterns. It aligns with the opinion of (Gosachi dan Japa, 2020) that engaging images can stimulate students' brains to be more creative in finding answers. Such a combination is rarely done because it requires significant time to prepare instructional materials or worksheets. Regardless, according to (İnan & Erkuş, 2017), well-prepared worksheets will maximize student performance in learning. Therefore, it is worthwhile to contribute to generating instructional materials in the form of students' worksheets based on the teaching model.

Based on previous research, ethnomathematics and Make-a-Match are highly relevant for geometry because the cultural content makes the mathematical context more realistic and engaging. It is expected to enhance students' understanding. Accordingly, this research will develop teaching materials in worksheets (LKPD) integrated with the ethnomathematics approach and Make-a-Match learning model.

METHOD

This study employed the research and development (R&D) method, which aimed to generate a specific product, develop it, and test its validity, practicality, and effectiveness. The subjects of this research are 35 eighth-grade students from SMP Negeri 1 Arjasa. The product is in the form of Student Worksheets or *Lembar Kerja Peserta Didik (LKPD).* This RND design utilized the ADDIE framework comprised of *Analysis, Design, Development, Implementation, and Evaluation*, a stage-based process developed by Dick

and Carey (1996, cited in Yuliastuti & Soebagyo, 2021). It is commonly used in educational settings as it is considered to be straightforward and relevant for the product being developed. The implementation scheme for each stage is outlined in Figure 1 below.
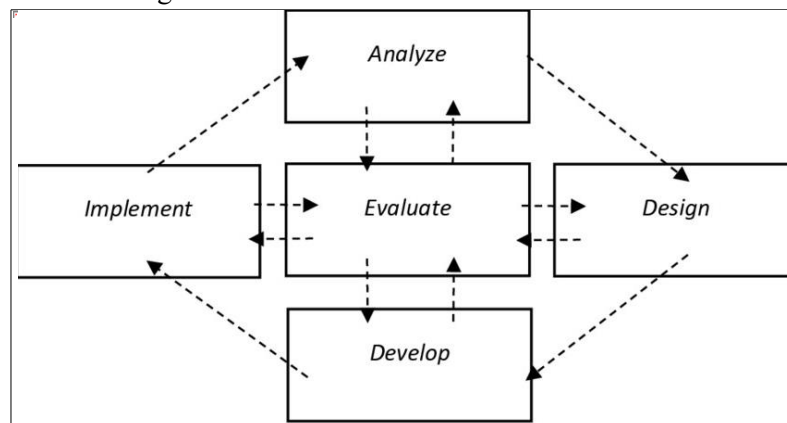

Figure **1. The Development Stages of ADDIE Framework**

1. Analysis
   It was conducted by observing the students and the instructional worksheets at the school. The data obtained included the need for teaching materials.
2. Design
   In this stage, the researcher designed or created the teaching materials. The teaching materials are produced as students' worksheets (LKPD).
3. Development
   After the product was designed, it was developed to ensure its validity. Validation was conducted by two teaching materials experts and one media expert. After being validated by the experts, the product can only be used after revisions. Table 1 is the validation grid that was provided to the experts.

Table 1. The Expert Validation Grid

No.	Validators	Aspek Penilaian
1.	Teaching Materials Experts	• Topic and materials conformity • Content Suitability
2.	Teaching Media Experts	• Appearance • Layout and arrangement Organization • Ease of use

After the experts validated the teaching materials, the researcher prepared the implementation instruments for the product. The instruments utilized include questionnaires, pretests, and posttests. The scoring categories that must be achieved regarding the development of istructional worksheets are referenced in Table 1, adopted from (Adnaniyah, 2023).

Table 2. Product Validity Assessment Categories

Percentage	Categories
0% ≤ Score ≤ 25%	Very Invalid
25% ≤ Score ≤ 50%	Invalid
51% ≤ Score ≤ 75%	Valid
76% ≤ Score ≤ 100%	Very Valid

4. Implementation
   This research was implemented by applying the product in the classroom as a trial process. Pretests and posttests were conducted to assess effectiveness using non-independent t-test calculations.

Additionally, questionnaires were distributed to students to gauge their responses to the product's practicality.

5. Evaluation

    During the evaluation phase, steps are taken to assign a value related to the processes that have been implemented. The assessed aspect is the product's practicality, as reflected in students' responses to the teaching materials through questionnaires. The improvement in students' understanding will determine the product's effectiveness after receiving the LKPD product. Feedback from teachers and students will serve as revisions to refine the product. Quantitative data scoring is obtained based on Table 2, which was adopted from (Adnaniyah, 2023).

Table 3. Product Practicality Assessment Categories

Percentage	Categories
0% ≤ Score ≤ 25%	Very impractical
25% ≤ Score ≤ 50%	Impractical
51% ≤ Score ≤ 75%	Practical
76% ≤ Score ≤ 100%	Very Practical

RESULTS AND DISCUSSION

After going through the stages of the ADDIE framework in developing the product, the results of this research and development are as follows:

1. Analysis

The need for teaching materials to fit students' abilities and characteristics was obtained after teachers and students had made observations. The analysis of the existing teaching materials in the school revealed that they were still too simple, with problem items lacking clarity for student understanding. After analyzing the teaching materials, the researcher observed the students, many of whom were not proficient in mathematics. Accordingly, an analysis was obtained regarding the teaching materials and the instructional method used in the class. The researcher decided to develop teaching materials that could improve student understanding and a teaching model to enhance understanding of mathematics.

2. Design

The teaching material product to be developed is ethnomathematics-based worksheets of LKPD with primary geometry material. The researcher determined that the material was geometry with an ethnomathematics approach. *Thus*, the initial design of the LKPD product is as follows:
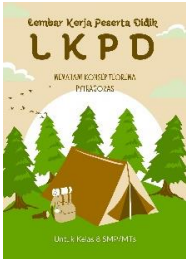
Table 4. Initial Design of Teaching Materials

Cover | Body | Body | Back cover
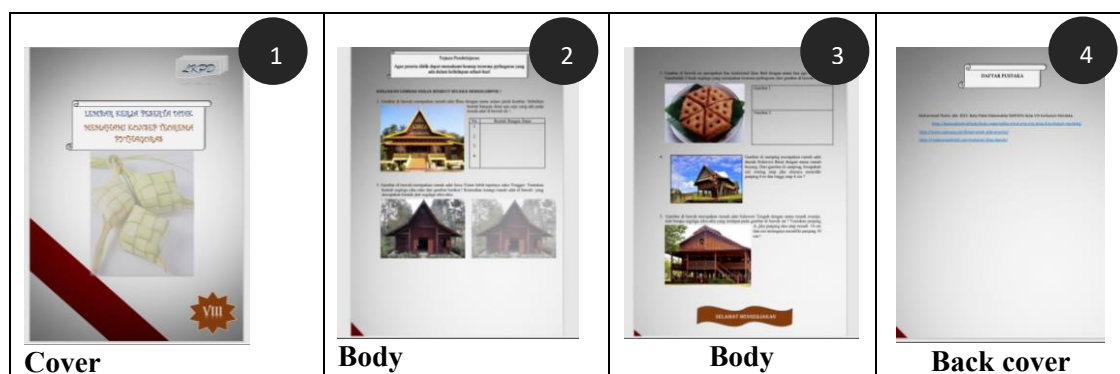
3. Development

This stage involves the validation test of the worksheet examined by the experts. It yielded a score indicating whether the teaching material is qualified as valid. The scores obtained from the experts are as follows:

Table 5. The Results of Teaching Material Validation by Experts

Expert Validators	Score	Categories
Teaching material expert 1	93,75%	Very Valid
Teaching material expert 2	82,14%	Very Valid
Media expert	75%%	Valid
Average	87,95%	Very valid

From the table above, the teaching materials used were deemed valid after several revisions by subject matter and media experts. The percentage result of the ethnomathematics-based LKPD is 83.63%, categorized as highly valid. The differences between the teaching materials before and after revision are as follows:

Table 6. The Results of Teaching Material Revision by Media Experts

Before	**After**
Cover	Cover
Body	Body
Back Cover	Back Cover

The revisions to the media primarily focused on enhancing the appearance of the teaching materials to make them more engaging for students and minimizing page changes. Meanwhile, revisions to the content were made to clarify the questions regarding the images used in each item.

After going through the revision stage, the content and media of the teaching materials were deemed valid. As displayed in the table, the subject matter expert evaluated the ethnomathematics-based LKPD teaching materials as suitable for the curriculum, with clear, coherent language relevant to everyday life. Thus, the results of this research align with the criteria for teaching materials according to (Aydin & Aytekin, 2018), which include a) being simple, straightforward, and easy to understand; b) reflecting as many real-life situations as possible; c) being easy to develop or revise. Furthermore, regarding design, the media expert provided positive feedback after the teaching materials were revised using Canva. It is consistent with the opinion of (A. Utami, 2023) that teaching materials should be visually designed to be engaging so students do not get bored.

1. Implementation

During the implementation phase, the revised LKPD teaching materials were utilized and introduced to the students as new learning materials. In the implementation phase, the researcher employed the Make-a-Match model in the teaching process. Make-a-Match was also integrated with an ethnomathematics approach applied through cards. Students were asked to complete a questionnaire related to the teaching materials they had used. The percentage score of the questionnaire test by the students increased from before and after using the ethnomathematics-based LKPD teaching materials. The score obtained was 92%, with the result presentation shown in Table 7 adopted from (Wijayanto & Santoso, 2018).

	Ease of Use	Benefit	Atractiveness	Eficiency	Clarity
Percentage	94%	95%	90%	89%	92%
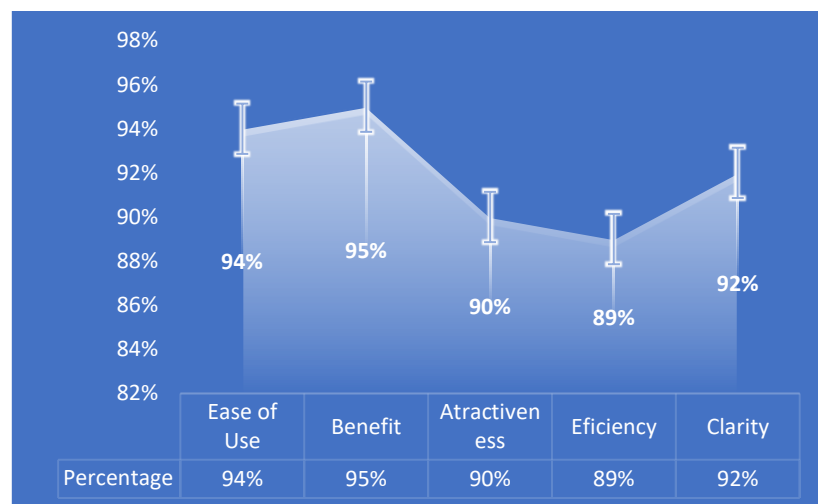
Figure 2. The Percentage of Teaching Material Practicality

Based on the table and the chart, the teaching materials can be considered "very practical". Furthermore, students became more active and motivated in the learning activities.

2. Evaluation

The evaluation phase is the final stage of the ADDIE model. In this stage, the researcher revises the ethnomathematics-based LKPD according to the feedback and shortcomings identified during

implementation with the students. The evaluation results encompass validity, effectiveness, and practicality. First, the validity test results by experts indicate that the teaching materials are "very valid" and suitable for use after the revision stage. Second, the practicality obtained from the student questionnaire results shows a score of 92%, meaning that these teaching materials are "very practical." It is in line with the theory of teaching material practicality according to (Doyle & Ponder, 1977), which argued that teaching materials should be practical so that students can easily use them. The results of the effectiveness test using pretest-posttest analysis with non-independent t-test calculations are shown in Tables 7 and 8.

Table 7. Descriptive Analysis

	Mean	N	Std. Deviation	Std. Error Mean
Pretest	64.17	24	17.673	3.607
Posttest	88.25	24	4.571	.933

Table 8. Effectiveness Analysis Results Using Non-Independent t-test

Pretest-Posttest	Mean	Std Deviation	Std error mean	Lower	Upper	t	df	Sig.(2-tailed)
	-24083	17.905	3.655	-31.644	-16.523	-6,589	23	0,000

The calculation results show that the average pretest score is 64.17, while the posttest score is 88.25, with a significance level of .000, less than 0.05. Thus, these teaching materials are deemed effective in fostering mathematics learning outcomes. These results are consistent with previous research indicating that ethnomathematics and the Make-a-Match model are effective in enhancing students' mathematical understanding (Erva et al., 2022; Fauhah & Rosy, 2020; Machaba & Dhlamini, 2021; Mare & Malik, 2023; Ulya & Rahayu, 2017). From these three research findings, Ethnomathematics-based and Make-a-Match Worksheets are inferred as valid, effective, and practical in enhancing students' understanding of geometry at the junior high school level.

CONCLUSION

Based on the research findings, the teaching materials used are highly valid, with a score of 83.63%. According to the results from the questionnaires administered to the students, the worksheets based on Ethnomathematics and Make-a-Match Model are also practical, with a practicality score of 92%. Moreover, based on the pretest-posttest results, there is a significant improvement in students' understanding, indicating the effectiveness of the LKPD. In conclusion, the Ethnomathematics-based and Make-a-Match Model teaching materials can enhance students' mathematics comprehension. The Make-a-Match model combined with ethnomathematics also stimulates students' engagement in learning. Students become more active and creative, and the learning objectives are achieved. The teaching materials do not need revision as they are effective, and students can comprehend each item. Based on this research, further studies are needed to develop more engaging teaching materials based on ethnomathematics to enlarge the development of mathematics learning, cultural values, and student engagement.

REFERENCES

Adnaniyah, A. N. (2023). The Development of Mathematics Teaching Materials To Improve Critical Thinking Through Stem-Based Discovery Learning Model. *The 2nd International Conference on Mathematics Education and Technology (ICOMET)*, 07–14. https://conference.unisma.ac.id/index.php/icomet/2nd/paper/view/3638

Atikurrahman, Moh., Hobri, & Yuliati, N. (2019). The development of comparison material tool with problem based learning based on caring community and its effect on the students' connection

ability. *Journal of Physics: Conference Series*, 12091. https://doi.org/10.1088/1742-6596/1211/1/012091

Aydin, A., & Aytekin, C. (2018). Teaching Materials Development and Meeting the Needs of the Subject: A Sample Application. *International Education Studies*, *11*(8), 27. https://doi.org/10.5539/ies.v11n8p27

Darwis Abroriy. (2020). Etnomatematika dalam Perspektif Budaya Madura. *Indonesian Journal of Mathematics and Natural Science Education*, *1*(3), 182–192. https://doi.org/10.35719/mass.v1i3.44

Doyle, W., & Ponder, G. A. (1977). The practicality ethic in teacher decision-making. *Interchange*, *8*(3), 1–12. https://doi.org/10.1007/BF01189290

Erva, R. A. L., Rosianawati, A., Pardimin, P., Nisa, A. F., & Irfan, M. (2022). PENGARUH PENGGUNAAN MODUL PEMBELAJARAN MATEMATIKA BERBASIS ETNOMATEMATIKA MELALUI PENDEKATAN SAINTIFIK TERHADAP HASIL BELAJAR SISWA. *Primary: Jurnal Pendidikan Guru Sekolah Dasar*, *11*(2), 491. https://doi.org/10.33578/jpfkip.v11i2.8676

Fauhah, H., & Rosy, B. (2020). Analisis Model Pembelajaran Make A Match Terhadap Hasil Belajar Siswa. *Jurnal Pendidikan Administrasi Perkantoran (JPAP)*, *9*(2), 321–334. https://doi.org/10.26740/jpap.v9n2.p321-334

Fitriatien, S. R. (n.d.). *Pembelajaran Berbasis Etnomatematika*.

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

Gosachi, I. M. A., & Japa, I. G. N. (2020). *Model Pembelajaran Make A Match Berbantuan Media Kartu Gambar Meningkatkan Hasil Belajar Matematika*. *3*(2).

Hasanah, H. (2020). Pengembangan Bahan Ajar Matematika Berbasis STEM Pada Materi Bangun Ruang. *Indonesian Journal of Learning Education and Counseling*, *3*(1). https://doi.org/10.31960/ijolec.v3i1.582

İnan, C., & Erkuş, S. (2017). The Effect of Mathematical Worksheets Based on Multiple Intelligences Theory on the Academic Achievement of the Students in the 4th Grade Primary School. *Universal Journal of Educational Research*, *5*(8), 1372–1377. https://doi.org/10.13189/ujer.2017.050810

Juliani, A., Mustadi, A., & Lisnawati, I. (2021). "Make A Match Model" for Improving the Understanding of Concepts and Student Learning Results. *Indonesian Journal on Learning and Advanced Education (IJOLAE)*, *3*(1), 48–56. https://doi.org/10.23917/ijolae.v3i1.10269

Kharisma, J. Y., & Asman, A. (2018). Pengembangan Bahan Ajar Matematika Berbasis Masalah Berorientasi pada Kemampuan Pemecahan Masalah Matematis dan Prestasi Belajar Matematika. *Indonesian Journal of Mathematics Education*, *1*(1), 34. https://doi.org/10.31002/ijome.v1i1.926

Lubis, A. N. M. T., Widada, W., Herawaty, D., Nugroho, K. U. Z., & Anggoro, A. F. D. (2021). The ability to solve mathematical problems through realistic mathematics learning based on ethnomathematics. *Journal of Physics: Conference Series*, *1731*(1), 012050. https://doi.org/10.1088/1742-6596/1731/1/012050

Machaba, F., & Dhlamini, J. (2021). Ethnomathematics as a Fundamental Teaching Approach. In K. Luneta (Ed.), *Mathematics Teaching and Professional Learning in sub-Sahara Africa* (pp. 59–76). Springer International Publishing. https://doi.org/10.1007/978-3-030-82723-6_5

Magdalena, I., Prabandani, R. O., Rini, E. S., Fitriani, M. A., & Putri, A. A. (2020). *ANALISIS PENGEMBANGAN BAHAN AJAR*. *2*.

Malikah, N., & Widhiasti, L. D. (2019). *Penerapan Metode Kartu Make and Match terhadap Hasil Belajar Matematika pada Materi Bangun Ruang*. *11*(2).

Mare, M., & Malik, M. A. (2023). *The Effectiveness of Make a Match Cooperative Learning on Problem Solving Ability and Mathematics Learning Outcomes of Elementary School Students*.

Maulidawati, M., Muhammad, I., Rohantizani, R., & Mursalin, M. (2020). The Implementation of Make A Match Type Cooperative Learning Model to Improve the Mathematical Connection Ability. *International Journal for Educational and Vocational Studies*, *2*(11). https://doi.org/10.29103/ijevs.v2i11.3319

Meaney, T., Trinick, T., & Allen, P. (2021). Ethnomathematics in Education: The Need for Cultural Symmetry. In M. Danesi (Ed.), *Handbook of Cognitive Mathematics* (pp. 1–29). Springer International Publishing. https://doi.org/10.1007/978-3-030-44982-7_4-1

Nurmaya, R. (2021). Pengembangan Bahan Ajar Berbasis Etnomatematika Pada Materi Transformasi Geometri. *RANGE: Jurnal Pendidikan Matematika*, *2*(2), 123–129. https://doi.org/10.32938/jpm.v2i2.941

Permatasari, A. E. (2020). *The Effect of Using the Make A Match Learning Model on Students' Critical Mathematical Thinking Skills*. 3.

Rezat, S., Fan, L., & Pepin, B. (2021). Mathematics textbooks and curriculum resources as instruments for change. *ZDM – Mathematics Education*, *53*(6), 1189–1206. https://doi.org/10.1007/s11858-021-01309-3

Rosa, M., D'Ambrosio, U., Orey, D. C., Shirley, L., Alangui, W. V., Palhares, P., & Gavarrete, M. E. (2016). *Current and Future Perspectives of Ethnomathematics as a Program*. Springer International Publishing. https://doi.org/10.1007/978-3-319-30120-4

Sunzuma, G., & Maharaj, A. (2022). Zimbabwean in-service teachers' views of geometry: An ethnomathematics perspective. *International Journal of Mathematical Education in Science and Technology*, *53*(9), 2504–2515. https://doi.org/10.1080/0020739X.2021.1919770

Tohir, M., Atikurrahman, M., Maswar, M., Daulay, L. A., Minhaji, M., Albadri, A., & Sardjono, W. (2021). Building a caring community in problem based learning to improve students' mathematical connection capabilities. *Journal of Physics: Conference Series*, *1839*(1). https://doi.org/10.1088/1742-6596/1839/1/012008

Ulya, H., & Rahayu, R. (2017). PEMBELAJARAN ETNOMATEMATIKA UNTUK MENURUNKAN KECEMASAN MATEMATIKA. *Jurnal Mercumatika : Jurnal Penelitian Matematika dan Pendidikan Matematika*, *2*(2). https://doi.org/10.26486/jm.v2i2.295

Utami, A. (2023). IMPLEMENTASI PEMBELAJARAN MATEMATIKA REALISTIK BERBASIS ETNOMATEMATIKA. *JP2M (Jurnal Pendidikan dan Pembelajaran Matematika)*, *9*(1), 116–124. https://doi.org/10.29100/jp2m.v9i1.1841

Utami, R. E., Nugroho, A. A., Dwijayanti, I., & Sukarno, A. (2018). Pengembangan E-Modul Berbasis Etnomatematika Untuk Meningkatkan Kemampuan Pemecahan Masalah. *JNPM (Jurnal Nasional Pendidikan Matematika)*, *2*(2), 268. https://doi.org/10.33603/jnpm.v2i2.1458

Wijayanto, R., & Santoso, R. H. (2018). Pengembangan Bahan Ajar Matematika dengan Pendekatan Problem Solving Berorientasi pada Kemampuan Pemecahan Masalah. *Jurnal Pedagogi Matematika*, *7*(3), Article 3. https://doi.org/10.21831/jpm.v7i3.11177

Yuliastuti, R., & Soebagyo, J. (2021). Pengembangan Bahan Ajar Matematika Berbasis Matematika Terapan pada Materi Matriks. *Jurnal Cendekia : Jurnal Pendidikan Matematika*, *5*(3), Article 3. https://doi.org/10.31004/cendekia.v5i3.811

Zhang, W., & Zhang, Q. (2010). Ethnomathematics and Its Integration within the Mathematics Curriculum. *Journal of Mathematics Education*, *3*(1), 151–157.

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