

Development of Student Worksheets Containing Ethnomathematics as Mathematics Teaching Materials for Class X of SMAN 1 Tulungagung

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Abstract

Mathematics learning in secondary schools often remains abstract and insufficiently connected to students' cultural contexts, which can limit engagement and problem-solving skills; therefore, ethnomathematics offers a meaningful approach by linking mathematical concepts with local cultural practices. This study aimed to develop and evaluate the validity, practicality, and effectiveness of ethnomathematics-based Student Worksheets (LKPD) on geometry for Grade X students at SMAN 1 Tulungagung. The research employed a Research and Development (R&D) method using the 4-D model, consisting of the Define, Design, Develop, and Disseminate stages, in which the LKPD were designed by integrating local cultural elements of Batik Reog Kendang Tulungagung into geometry learning activities. The results showed that expert validation achieved a Content Validity Index (CVI) of 0.86, indicating very high validity, while practicality assessments from teachers and students yielded an average score of 89%, categorized as very good. Furthermore, post-test results demonstrated that 84.38% of students met the minimum mastery criterion, supported by classroom observations that revealed increased student engagement and active participation. In conclusion, the ethnomathematics-based LKPD developed in this study are valid, practical, and effective, providing a culturally responsive instructional approach that enhances students' conceptual understanding and mathematical problem-solving abilities in geometry learning.

Keywords: *Ethnomathematics; Student Worksheets; Geometry Learning; Learning Effectiveness*

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INTRODUCTION

Education plays a fundamental role in developing students' intellectual, social, and cultural capacities, enabling them to respond to the demands of contemporary society. In mathematics education, learning is expected not only to transmit abstract concepts but also to foster meaningful understanding through active engagement and contextual experiences. However, classroom practices often remain dominated by teacher-centered approaches and the use of conventional textbooks, which limit students' opportunities to explore mathematical ideas independently and meaningfully (Zagoto & Dakhi, 2018).

Mathematics is a core subject that contributes significantly to the development of logical, analytical, and problem-solving skills. Despite its importance, many students perceive mathematics as difficult and abstract, particularly when learning materials are detached from real-life contexts. This condition negatively affects students' motivation and conceptual

understanding, especially at the senior high school level (Anggraini et al., 2022; Fikjayanti et al., 2023). Therefore, mathematics instruction requires learning materials that are contextual, student-centered, and closely related to student's lived experiences.

One promising approach to contextualizing mathematics learning is the integration of culture through ethnomathematics. Ethnomathematics views mathematical ideas as embedded in cultural practices, artifacts, and daily activities of a particular community. Numerous studies have demonstrated that cultural elements such as traditional architecture, crafts, batik motifs, musical instruments, and local markets contain rich mathematical concepts, particularly in geometry and transformation topics (Bustan et al., 2022; Kehi et al., 2022; Novitasari et al., 2022). By connecting mathematics to familiar cultural contexts, ethnomathematics helps students construct knowledge more concretely and meaningfully.

In the context of geometry, ethnomathematics has been widely applied to explore concepts such as transformations, spatial reasoning, and geometric patterns. For instance, studies have integrated cultural contexts into learning materials on geometric transformations and curved solid figures, showing positive impacts on students' understanding and engagement (Ainiyah & Loviana, 2024; Luthfi & Rakhmawati, 2022; Nurmaya, 2021). Similarly, ethnomathematical approaches using local cultural artifacts have been proven effective in enhancing students' problem-solving skills and cultural awareness (Rewatus et al., 2020; Mahlina et al., 2022).

Student Worksheets (LKPD) serve as an essential teaching material to support structured, guided, and student-centered learning. Well-designed LKPD encourage students to actively explore concepts, solve problems systematically, and reflect on their learning processes. However, many existing worksheets function merely as collections of routine exercises and lack meaningful guidance or contextual relevance (Hairani et al., 2022). Consequently, students often engage in procedural learning without developing deep conceptual understanding.

Recent research highlights the potential of ethnomathematics-based LKPD to address these limitations. Several studies have reported that ethnomathematics-oriented worksheets improve students' learning outcomes, conceptual understanding, and motivation by linking mathematical concepts with cultural contexts familiar to learners (Fairuz et al., 2020; Luthfi & Rakhmawati, 2022; Ulantina et al., 2023). Moreover, the integration of digital platforms such as Liveworksheets has further enhanced the interactivity and effectiveness of LKPD, particularly in supporting independent and flexible learning (Adrillian et al., 2024; Azmi & Ummah, 2024; Hermawan et al., 2025).

Although many studies have explored the development of ethnomathematics-based LKPD at the junior high school level and for various mathematical topics, research focusing on senior high school students, particularly Grade X and the use of local cultural contexts remains limited. Additionally, few studies have specifically addressed the systematic development of ethnomathematics-based worksheets as mathematics teaching materials aligned with students' needs and local culture in specific educational settings.

Therefore, this study aims to develop student worksheets containing ethnomathematics as mathematics teaching materials for Grade X students at SMAN 1 Tulungagung. The developed worksheets are designed to integrate local cultural elements into mathematics learning to enhance students' conceptual understanding, engagement, and appreciation of local culture. This study is expected to contribute practically to the development of contextual and

culturally responsive mathematics teaching materials and theoretically to the enrichment of ethnomathematics-based learning research at the senior high school level.

METHOD

1. Research Design

This study employed a Research and Development (R&D) approach aimed at producing a valid and practical instructional product in the form of ethnomathematics-based student worksheets (LKPD) for geometry learning. The development process focused on generating teaching materials that are pedagogically sound, culturally relevant, and suitable for Grade X senior high school students. The development procedure was conceptually aligned with the 4-D model (*define, design, develop, and disseminate*) and operationally implemented through structured stages resembling the ADDIE framework, namely analysis, design, and development. The dissemination stage was limited to classroom-level implementation due to the scope of the study.

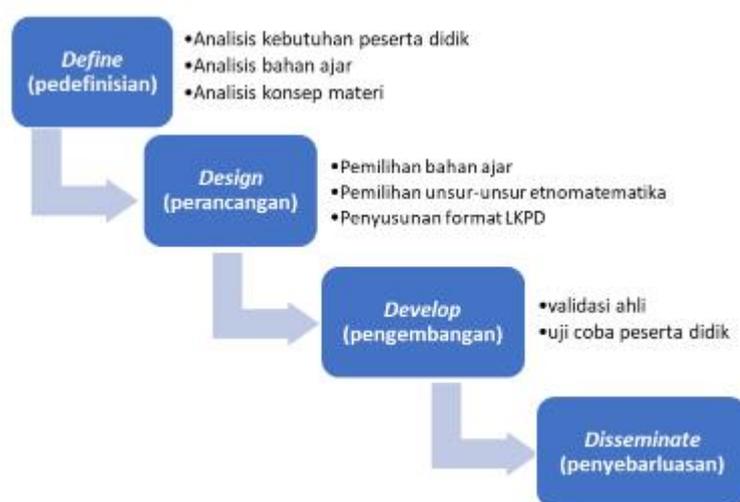


Figure 1. Model of LKPD Development (4-D Model)

2. Development Stages

a. Define Stage

At the define stage, a needs analysis was conducted to identify learning conditions and instructional challenges faced by Grade X students at SMAN 1 Tulungagung. This stage involved analyzing:

- Students' characteristics and learning needs,
- The geometry content, particularly lines and angles, and
- The availability and limitations of existing mathematics teaching materials.

The analysis revealed that current learning resources were predominantly textbook-oriented and lacked contextual and cultural integration, indicating the need for culturally responsive teaching materials.

b. Design Stage

During the design stage, the structure and content of the ethnomathematics-based LKPD were planned. This included:

- Selecting local cultural elements relevant to geometric concepts,
- Designing learning activities that connect mathematical concepts with cultural contexts,

- Structuring the LKPD to include learning objectives, guided activities, reflective questions, and evaluation tasks.

The worksheet design emphasized student-centered learning, encouraging exploration, discussion, and conceptual understanding through culturally meaningful examples.

c. Develop Stage

At the development stage, the LKPD draft was subjected to expert validation and limited field testing. Validation was conducted by content experts and media experts to assess the worksheet's content accuracy, instructional design, language clarity, and visual presentation. Revisions were made based on experts' feedback to improve the quality of the product.

After being declared valid, the revised LKPD was implemented in a limited trial involving Grade X students at SMAN 1 Tulungagung. This trial aimed to evaluate the practicality of the LKPD when used in real classroom settings.

3. Data Collection Techniques

The data collected in this study consisted of:

- a. Quantitative data, obtained from expert validation scores and student response questionnaires measuring practicality, and
- b. Qualitative data, derived from suggestions and comments provided by validators for product improvement.

Validation instruments were completed by content and media experts using a four-point rating scale, while practicality data were collected through student response questionnaires.

4. Data Analysis

Data analysis was conducted using descriptive qualitative and quantitative methods.

a. Validity Analysis

The validity of the LKPD was determined based on expert evaluation using a four-point scale: 1 = not valid, 2 = less valid, 3 = valid, 4 = very valid. The final validity score (S_a) was calculated using the following formula:

$$S_a = \frac{\text{Total score from expert validation}}{\text{maximum possible score}}$$

Table 1. Validity Criteria of Learning Materials

Score Range	Category
$3,5 \leq S_a < 4,0$	Very Valid
$2,5 \leq S_a < 3,5$	Valid
$1,5 \leq S_a < 2,5$	Less Valid
$1,0 \leq S_a < 1,5$	Not Valid

b. Practicality Analysis

The practicality of the LKPD was assessed using student response questionnaires based on a four-point Likert scale. The practicality level was determined by calculating

the percentage of positive responses, which were then classified according to the criteria shown in Table 2.

Table 2. Criteria for Students' Response Percentage

Score Range	Category
$75\% \leq x < 100\%$	Very Good
$50\% \leq x < 75\%$	Good
$25\% \leq x < 50\%$	Less Good
$0\% \leq x < 25\%$	Not Good

RESULTS AND DISCUSSION

The results of this study describe the development and evaluation of ethnomathematics-based student worksheets (LKPD) using the 4-D development model, which consists of the define, design, develop, and disseminate stages. The findings focus on the validity, practicality, and effectiveness of the developed LKPD as mathematics teaching materials for Grade X students at SMAN 1 Tulungagung.

1. Define Stage

The define stage in the development of the ethnomathematics-based Student Worksheets (LKPD) aimed to systematically identify learning needs, instructional conditions, and contextual factors influencing geometry learning at SMAN 1 Tulungagung. Classroom observations and semi-structured interviews with mathematics teachers revealed that instructional practices were still largely dependent on textbook-based learning aligned with the 2013 curriculum. Learning activities predominantly involved lectures, teacher-led explanations, and routine assignments, with minimal integration of contextual or culturally relevant materials. This instructional approach limited opportunities for students to actively construct mathematical understanding or relate abstract concepts to real-life situations.

An in-depth analysis of students' cognitive, motivational, and socio-cultural characteristics indicated a strong need for learning materials that were interactive, contextually rich, and capable of fostering higher-order thinking skills, particularly in geometry topics such as lines, angles, and transformations. Students exhibited difficulties in visualizing geometric concepts and applying them in problem-solving contexts, reflecting the gap between theoretical instruction and practical application. Consequently, the learning objectives of the LKPD were designed to facilitate meaningful learning by connecting geometric concepts with local cultural elements, such as Batik Reog Kendang Tulungagung motifs, which are familiar to students and embedded in daily practices.

The worksheets were structured to guide students in identifying mathematical properties inherent in cultural artifacts, engaging in guided exploration activities, reflecting on problem-solving strategies, and completing structured exercises that promote analytical and critical thinking. By contextualizing geometry learning within ethnomathematical frameworks, the LKPD aimed to enhance students' conceptual understanding, improve problem-solving competence, and foster engagement and motivation. This approach aligns with previous research highlighting the effectiveness of culturally responsive learning materials in improving comprehension, motivation, and active participation in mathematics learning (Fairuz et al., 2020; Luthfi & Rakhmawati, 2022; Mahlina et al., 2022).

2. Design Stage

Based on the needs analysis, LKPD was selected as the instructional medium due to its ability to support structured and student-centered learning. The worksheets were designed by integrating ethnomathematics with problem-solving activities. Local cultural elements from Tulungagung, particularly geometric patterns found in traditional batik motifs, were incorporated as contextual representations of mathematical concepts.

The LKPD was designed to include learning objectives, contextual problem situations, guided exploration activities, reflection questions, and evaluation tasks. This structure was intended to facilitate the gradual construction of students' mathematical understanding while maintaining meaningful connections to familiar cultural contexts. The integration of local cultural elements aimed to enhance the relevance of geometry learning to students' daily experiences and to support conceptual understanding by linking abstract concepts with culturally familiar representations. The resulting initial LKPD prototype served as the basis for expert validation and subsequent revision.



Figure 2. Product Design LKPD

3. Develop Stage

a. Validity of the LKPD

At the develop stage, the LKPD prototype was evaluated through expert validation to assess its suitability as a mathematics teaching material. The validation process involved material experts and media experts, who assessed several aspects, including content accuracy, clarity of language, appropriateness of ethnomathematical contexts, and instructional design.

Table 3. Validation Results of the Ethnomathematics-Based LKPD

No	Aspect	CVI	Category
1	LKPD format	0,9	Very Valid
2	Language	0,68	Valid
3	Content	1	Very Valid
Average		0,86	Very Valid

Table 3, the average Content Validity Index (CVI) of the ethnomathematics-based Student Worksheets (LKPD) was 0.86, indicating that the product falls within the "very valid" category. The format and content aspects received very valid ratings, confirming that the structure, organization, and alignment of the worksheets with learning objectives were

appropriate and pedagogically sound. The language aspect was rated as valid, suggesting that minor revisions were necessary to improve clarity, readability, and accessibility for Grade X students.

These results indicate that integrating ethnomathematical contexts into LKPD can produce instructional materials that are both conceptually accurate and educationally effective. The inclusion of culturally contextualized problems, such as patterns from Batik Reog Kendang Tulungagung, ensures that abstract mathematical concepts are linked to familiar cultural experiences, thereby facilitating meaningful learning. These findings are in line with previous research demonstrating that ethnomathematics-based worksheets satisfy content validity requirements and are suitable for supporting mathematics learning at the secondary school level (Fairuz et al., 2020; Luthfi & Rakhmawati, 2022; Rewatus et al., 2020).

In addition to quantitative validation, qualitative feedback from expert validators emphasized the need to simplify sentence structures, enhance visual presentation, and strengthen the integration between mathematical problems and cultural contexts. Revisions were applied accordingly, improving the instructional clarity, visual appeal, and overall usability of the LKPD. These adjustments ensured that the worksheets were not only valid in content but also practical and engaging for classroom implementation, providing a solid foundation for the subsequent phases of development and student testing.

b. Practicality of the LKPD

The practicality of the ethnomathematics-based LKPD was assessed through response questionnaires administered to mathematics teachers and Grade X students following classroom implementation. The evaluation aimed to determine the ease of use, clarity of presentation, and engagement potential of the worksheets in supporting learning activities. The results are presented in Table 4.

Table 4. Practicality Results Based on Teacher and Student Responses

No	Respondent Group	Percentage	Category
1	Teacher response	92%	Very Good
2	Student response	86%	Very Good
	Average	89%	Very Good

Table 4, the overall practicality score of the ethnomathematics-based Student Worksheets (LKPD) reached 89%, categorized as very good. This finding indicates that the LKPD was user-friendly, well-structured, and capable of maintaining student engagement throughout the learning process. The worksheets were designed to provide clear step-by-step guidance, incorporating guided exploration activities, reflection questions, and structured problem-solving tasks, which facilitated both independent and collaborative learning.

Feedback from mathematics teachers indicated that the LKPD effectively supported classroom instruction by providing a systematic framework for implementing problem-solving strategies. Teachers observed that students were more actively involved in discussions, engaged in analytical thinking, and demonstrated higher levels of participation compared with conventional textbook-based instruction. Teachers also emphasized that the worksheets' integration of culturally familiar contexts helped bridge the gap between abstract geometric concepts and students' daily experiences, making learning more meaningful and motivating.

From the students' perspective, the LKPD was perceived as engaging, interactive, and beneficial for understanding geometry concepts, especially lines, angles, and transformations, within the context of local culture. The inclusion of geometric patterns from Batik Reog Kendang Tulungagung enabled students to relate abstract mathematical principles to tangible cultural artifacts, enhancing both conceptual comprehension and cognitive retention. These findings are consistent with previous research suggesting that culturally contextualized learning materials, particularly ethnomathematics-based worksheets, improve usability, foster student motivation, and strengthen engagement in mathematics learning (Hairani et al., 2022; Ulantina et al., 2023; Mahlina et al., 2022). Overall, the practicality analysis confirms that the developed LKPD is highly applicable, facilitating meaningful, culturally responsive, and student-centered learning in the geometry classroom.

c. Effectiveness of the LKPD

The effectiveness of the ethnomathematics-based LKPD was evaluated through a post-test administered to 32 Grade X students after completing learning activities using the worksheets. The results are summarized in Table 5.

Table 5. Student Learning Mastery Results

No	Description	Number of Students
1	Students achieving mastery	27
2	Students not achieving mastery	5
Total students		32
Mastery percentage		84.38%

Table 5 show 27 out of 32 students achieved scores above the Minimum Mastery Criterion (KKM), resulting in a learning mastery percentage of 84.38%. This finding indicates that the ethnomathematics-based Student Worksheets (LKPD) developed in this study were effective in enhancing students' understanding of key geometry concepts, including lines, angles, and geometric transformations, as well as in improving their mathematical problem-solving abilities. The integration of culturally contextualized problems provided students with meaningful opportunities to relate abstract mathematical concepts to familiar elements from their local culture, particularly the patterns and motifs of Batik Reog Kendang Tulungagung.

Classroom observations further demonstrated increased student engagement and active participation. Students were more involved in discussions, demonstrated higher levels of inquiry through questions, and collaborated more effectively during group activities. The visual and contextual integration of local cultural motifs enhanced both the attractiveness of the worksheets and students' focus, thereby fostering positive attitudes toward mathematics learning. This dual impact on cognitive and affective domains underscores the importance of culturally responsive instructional materials in supporting both conceptual mastery and learner motivation.

These findings are consistent with previous research indicating that ethnomathematics-based worksheets can improve students' learning outcomes, stimulate critical thinking, and strengthen problem-solving skills (Mahlina et al., 2022; Ulantina et al., 2023). Furthermore, the combination of guided problem-solving steps, structured exercises, and culturally relevant contexts facilitated a more comprehensive learning experience by bridging theoretical knowledge with practical, culturally situated applications. Overall, the results support the notion that integrating local cultural elements into mathematics education not only enhances

conceptual understanding but also promotes student engagement, motivation, and appreciation for culturally meaningful learning experiences (Silvia & Mulyani, 2019).

4. Disseminate Stage

The disseminate stage was conducted on a limited scale by distributing the validated LKPD to Grade X students and mathematics teachers at SMAN 1 Tulungagung. The main objective of this stage was to assess the feasibility of classroom-level implementation rather than large-scale distribution.

The results confirmed that the LKPD met the criteria for validity, practicality, and effectiveness as mathematics teaching materials. The integration of local cultural contexts, such as Batik Reog Kendang Tulungagung motifs, enhanced the meaningfulness of learning and helped students understand geometry concepts, particularly lines, angles, and transformations, in a more concrete and contextualized manner. Teachers reported that the worksheets provided a valuable alternative to conventional worksheets, supporting active, engaging, and context-based learning in the classroom.

Overall, the findings indicate that the ethnomathematics-based student worksheets developed using the 4-D model meet high quality standards in terms of validity, practicality, and effectiveness. Expert evaluations confirmed that the worksheets are pedagogically sound and conceptually appropriate, while responses from both teachers and students demonstrated that the LKPD is easy to use, engaging, and supportive of classroom learning. In addition, students' learning outcomes showed a high level of mastery, indicating that the worksheets effectively facilitate the understanding of geometric concepts and problem-solving skills.

These findings strengthen the argument that integrating local cultural contexts into mathematics teaching materials can significantly enhance students' conceptual understanding and learning engagement. By embedding ethnomathematical elements within structured learning activities, the developed LKPD not only serves as a contextual and culturally responsive instructional resource for Grade X mathematics learning but also contributes theoretically to the growing body of research on ethnomathematics-based instruction at the senior high school level.

CONCLUSION

The ethnomathematics-based student worksheets (LKPD) developed for Grade X mathematics at SMAN 1 Tulungagung demonstrated high quality in terms of validity, practicality, and effectiveness. Expert validation indicated a very valid rating (CVI = 0.86), confirming the adequacy of content, language, presentation, and integration of relevant local cultural elements related to lines and angles. Practicality assessments based on teacher and student responses yielded an average score of 89–95%, showing that the LKPD is easy to use, clearly presented, engaging, and supportive of classroom learning. Teachers reported that the worksheets facilitated instruction and promoted active student participation, while students appreciated the contextualized learning activities that connected abstract geometric concepts with familiar cultural experiences.

Effectiveness was evidenced by post-test results, where 84.38% of students achieved mastery, surpassing the minimum criterion, indicating that the worksheets effectively supported students' conceptual understanding and problem-solving skills. Observations further revealed increased engagement, critical thinking, and collaborative learning, enhanced by the integration

of local cultural motifs such as Batik Reog Kendang Tulungagung. Overall, the developed LKPD serves as a culturally responsive and pedagogically sound instructional resource, offering both practical and theoretical contributions to mathematics education. It provides a viable alternative to conventional worksheets by promoting meaningful learning, fostering students' appreciation of local culture, and enhancing their analytical and problem-solving abilities in geometry.

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REFERENCES

- Adinda, S. B., Firdaus, H. P. E., & Fatqurhohman, F. (2024). Pengembangan LKPD berbasis etnomatematika pada arsitektur Pura Mandhara Giri Semeru Agung. *Mandalika Mathematics and Educations Journal*, 7(2), 691–704. <https://doi.org/10.29303/jm.v7i2.9218>
- Adrillian, H., Rahmawati, N. D., & Sugiyono, E. (2024). Pengembangan e-LKPD berbantuan Liveworksheets terhadap kemampuan numerasi peserta didik jenjang SMK pada materi trigonometri kelas X. *Jurnal Riset dan Inovasi Pembelajaran*, 4(2), 1079–1093. <https://doi.org/10.51574/jrip.v4i2.1815>
- Ainiyah, N., & Loviana, S. (2024). Pengembangan lembar kerja peserta didik (LKPD) berbasis etnomatematika pada materi transformasi. *Al-'Adad: Jurnal Tadris Matematika*, 3(2), 243–256. <https://doi.org/10.24260/>
- Anggraini, R. D., Murni, A., & Gunawan, T. (2022). Pengembangan perangkat pembelajaran menggunakan problem-based learning pada materi SPLTV untuk memfasilitasi kemampuan pemecahan masalah matematis. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 6(3), 3136–3147. <https://doi.org/10.31004/cendekia.v6i3.1658>
- Azmi, R. D., & Ummah, S. K. (2024). Penyusunan LKPD interaktif berbantuan Liveworksheets bagi guru SMP. *JAPI (Jurnal Akses Pengabdian Indonesia)*, 9(1), 67–74. <https://doi.org/10.33366/japi.v9i1>
- Bai, L., Yang, B., & Yuan, S. (2023). Evaluating education effects of online learning for local university students in China: A case study. *Sustainability*, 15(13). <https://doi.org/10.3390/su15139860>
- Bustan, A. W., Salmin, M., & Talib, T. (2022). Transformasi geometri pada batik Malefo. *Jupitek*, 4(2), 87–94. <https://doi.org/10.30598/jupitekvol4iss2pp87-94>
- Dhena, G. V. A., Kua, M. Y., Dolo, F. X., & Laksana, D. N. L. (2024). Pengembangan lembar kerja peserta didik (LKPD) IPAS berbasis praktikum sederhana bagi siswa kelas IV SD. *Jurnal Muara Pendidikan*, 9(1), 55–64. <https://doi.org/10.52060/mp.v9i1.1908>

- Fairuz, F. R., Fajriah, N., & Danaryanti, A. (2020). Pengembangan LKPD materi pola bilangan berbasis etnomatematika Sasirangan di kelas VIII sekolah menengah pertama. *Jurnal Pendidikan Matematika*, 8(1), 29–38. <https://dx.doi.org/10.20527/edumat.v8i1.8343>
- Hairani, G. R., Safruddin, & Setiawan, H. (2022). Pengembangan lembar kerja peserta didik berbentuk cerita bergambar. *Journal of Classroom Action Research*, 4(1), 142–148. <https://doi.org/10.29303/jcar.v4i1.1805>
- Hermawan, L. I., Fatqurhohman, F., & Ismiyati, E. (2025). E-LKPD culturally responsive teaching dengan Liveworksheets dan Quizizz paper mode untuk meningkatkan hasil belajar trigonometri. *SCIENCE: Jurnal Inovasi Pendidikan Matematika dan IPA*, 5(2), 846–856. <https://doi.org/10.51878/science.v5i2.5716>
- Hindarto, C. R., & Sulistyani, N. (2024). Pengembangan media pembelajaran Desmos Classroom Activity untuk meningkatkan pemahaman konsep transformasi geometri menggunakan konteks Grebeg Maulud. *Jurnal Pendidikan Matematika*, 6(1). <https://doi.org/10.30822/asimtot.v6i01.4019>
- Kehi, S., Son, A. L., & Simarmata, J. E. (2022). Studi etnomatematika: Makna simbolik dan konsep matematika pada rumah adat Hamanas Malaka. *PRISMA*, 11(2), 585. <https://doi.org/10.35194/jp.v11i2.2587>
- Khafida, I. L., & Ismono, I. (2021). Pengembangan LKPD inkuiri berbasis hands-on dan minds-on activity untuk meningkatkan HOTS pada materi laju reaksi. *UNESA Journal of Chemical Education*, 10(1), 38–47. <https://doi.org/10.26740/ujced.v10n1.p38-47>
- Luthfi, H., & Rakhmawati, F. (2022). Pengembangan lembar kerja peserta didik (LKPD) berbasis etnomatematika pada materi bangun ruang sisi lengkung kelas IX. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 7(1), 98–109. <https://doi.org/10.31004/cendekia.v7i1.1877>
- Mahlina, O., Ansori, H., & Suryaningsih, Y. (2022). Pengembangan lembar kerja peserta didik berbasis etnomatematika pasar terapung pada materi aritmatika sosial untuk siswa kelas VII SMP. *JURMADIKTA*, 2(2), 1–10. <https://doi.org/10.20527/jurmadijta.v2i3.1260>
- Ma'wa, A., Hapipi, H., Turmuzi, M., & Azmi, S. (2021). Pengembangan LKPD berbasis PBL untuk meningkatkan kemampuan pemecahan masalah siswa kelas VIII pada materi sistem persamaan linear dua variabel. *Griya Journal of Mathematics Education and Application*, 1(4), 631–640. <https://doi.org/10.29303/griya.v1i4.114>
- Novitasari, D., Sridana, N., & Tyaningsih, R. Y. (2022). Eksplorasi etnomatematika dalam alat musik gendang beleq suku Sasak. *Indiktika: Jurnal Inovasi Pendidikan Matematika*, 5(1), 16–27. <https://doi.org/10.31851/indiktika.v5i1.7970>
- 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>
- Rewatus, A., Leton, S. I., Fernandez, A. J., & Suciati, M. (2020). Pengembangan lembar kerja peserta didik berbasis etnomatematika pada materi segitiga dan segiempat. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 4(2), 645–656. <https://doi.org/10.31004/cendekia.v4i2.276>
- Ulantina, Y. A., Sridana, N., Lu'luilmaknun, U., & Soepriyanto, H. (2023). Efektivitas LKPD berbasis budaya lokal dalam materi himpunan kelas VII di SMPN 9 Mataram. *Jurnal Ilmiah Profesi Pendidikan*, 8(4), 2302–2307. <https://doi.org/10.29303/jipp.v8i4.1782>

Zagoto, M. M., & Dakhi, O. (2018). Pengembangan perangkat pembelajaran matematika peminatan berbasis pendekatan saintifik untuk siswa kelas XI sekolah menengah atas. *Jurnal Review Pendidikan dan Pengajaran (JRPP)*, 1(1), 157–170. <https://doi.org/10.31004/jrpp.v1i1.884>