Jurnal Pendidikan Matematika Universitas Lampung
Vol. 14, No. 1, 2026, pp. 1 – 19
https://jurnal.pbs.fkip.unila.ac.id/index.php/jpm/
ISSN: 2715-856X

# Development of an Ethnomathematics-Based LKPD on Local Cultural of Jihat Ninek Depati Intan Kemalo Sari on the Material Flat Shapes

Novita Sari*, Rilla Gina Gunawan

Department of Mathematics Education, Faculty of Tarbiyah and Teacher Training, Kerinci State Islamic Institute, Jambi, Indonesia

*Email: novitasa702@gmail.com

*corresponding author

ARTICLE INFO

**Article history**
Received: 10 March, 2026
Revised: 21 March, 2026
Accepted: 22 March, 2026
Published: 31 March, 2026

**Keywords**
ethnomathematics;
geometric shapes;
LKPD;
local culture;

ABSTRACT

This study aims to develop an ethnomathematics-based LKPD (student worksheet) based on the local culture of Jihat Ninek Depati Intan Kemalo Sari on the material flat shapes and to determine its level of validity and practicality. The method used in this study was Research and Development with the Plomp development model, which consists of the stages of initial investigation, development, and evaluation. A limited trial was conducted with 26 ninth-grade students at State Junior High School 14 Kerinci in the 2025/2026 academic year. The instruments used in this study included a validation sheet prepared by experts and a practicality questionnaire for teachers and students. The data were analyzed using the Aiken index to measure validity and percentage analysis to assess practicality. The results of this study indicate that the developed LKPD demonstrated a high level of validity, with an average score of 0.84, and a practicality level of 81%. However, this study is limited to the validity and practicality evaluation stages and does not include effectiveness testing. This limitation is due to time constraints and the scope of the research, which focuses on product development. Therefore, further research is recommended to examine the effectiveness of the developed LKPD in improving students' learning outcomes and mathematical understanding through broader implementation. The findings of this study suggest that ethnomathematics-based LKPD can serve as an alternative teaching material that is relevant and meaningful, as it integrates mathematical concepts with local cultural values, while also supporting the strengthening of the Pancasila Student Profile in mathematics learning.

**How to Cite:** Sari, N., & Gunawan, R. G. (2026). Development of an Ethnomathematics-Based LKPD on Local Cultural of Jihat Ninek Depati Intan Kemalo Sari on the Material Flat Shapes. *Jurnal Pendidikan Matematika Universitas Lampung*, *14*(1), 1-19. http://dx.doi.org/10.23960/mtk/v14i1.pp1-19

## INTRODUCTION

Mathematics is a subject taught from elementary school to university and plays a significant role in various aspects of life. Besides being a tool for solving quantitative problems, mathematics is also embedded in cultural practices. However, many students view mathematics as a difficult and uninteresting subject, which ultimately results in low motivation to learn (Monalisa et al., 2023). Difficulty understanding mathematical concepts often results in shallow understanding that is easily forgotten (Cholid et al., 2022; Rohim & Prayogi, 2023).

Problems in mathematics learning today are still characterized by the use of irrelevant learning resources and the failure to connect mathematical concepts to students' daily experiences. Mathematics learning, especially in the field of plane geometry, is often presented in a non-concrete manner, emphasizing formulas and procedures. This makes it difficult for students to understand the meaning of the concepts being studied (Nasution et al., 2024). This condition has an impact on low learning motivation and conceptual understanding of mathematics material (Mirna et al., 2023). Furthermore, One of the learning tools commonly used in schools is the *Lembar Kerja Peserta Didik* (LKPD), which in English is equivalent to a student worksheet. LKPD is a teaching material that contains structured tasks and activity guidelines designed to help students actively construct their understanding through step-by-step learning processes. However, in practice, many LKPD used in schools are still general in nature and have not utilized the potential of local culture as a contextual learning resource that is close to students' lives (Meika et al., 2025). In fact, the integration of local culture in mathematics teaching through the ethnomathematics method can make learning more meaningful and contextual. According to D'Ambrosio (2001), ethnomathematics is a way of connecting mathematical ideas with the cultural customs of a society. This helps students understand abstract concepts through real and relevant experiences (Marlissa et al., 2024).Therefore, it is necessary to develop of an ethnomathematics-based LKPD by utilizing the local culture of Jihat Ninek Depati Intan Kemalo Sari on the material flat shape as an effort to increase students' understanding, involvement, and motivation in learning mathematics.

One local tradition that can be adapted in the mathematics learning process is Jihat Ninek Depati Intan Kemalo Sari, a cultural concept that developed in Siulak Mukai Hamlet, Kerinci Regency, Jambi. This historical site, which has existed for approximately 300 years, carries spiritual values in the form of respect for ancestors and the community's belief in the balance of interactions between humans, nature, and the Creator (Sunliensyar, 2018). In addition, Jihat Ninek Depati Intan Kemalo Sari also reflects the philosophy of life of the local community that highly values order, togetherness, and harmony within society. These values are seen in the traditional geometric patterns present in the spatial structure, building shapes, and ornaments on the site, such as squares, rectangles, and the idea of symmetry that demonstrates order and balance (Turyani et al., 2024). These geometric patterns can be studied through an ethnomathematics approach as a context for teaching geometry about plane shape, thereby making the learning process more relevant and meaningful for students (Aini et al., 2025; Gunawan et al., 2022).

Figure 1. Jihat Ninek Depati Intan Kemalo Sari from Siulak Mukai in mathematics learning can create a relevant and impactful learning process for students. Jihat Ninek

Depati Intan Kemalo Sari is a cultural and spiritual site in the form of a luhah (tomb) of the ninek ancestors or first ancestors who hold an important position in the local community's customary system. The elements of local wisdom integrated within it, such as the layout of the customary area, geometric symbols on buildings and ornaments around the site, and the measurement and spatial division systems within the customary area, can be utilized as a context for mathematics learning activities focused on plane shapes in geometry (Widyaningrum & Prihastari, 2021). Through this approach, students not only learn abstract mathematical concepts, but are also able to understand the cultural and spiritual meanings inherited from their ancestors, so that learning mathematics becomes a means to foster an attitude of respect for local culture and maintain harmony between modern science and traditional traditions (Lubis et al., 2024).

**Figure 1.** Jihat Ninek Depati Intan Kemalo Sari from Siulak Mukai

To implement ethnomathematics in geometry teaching related to plane shapes, appropriate and contextually relevant learning tools are required. One highly useful learning tool, the Student Worksheet, serves as a teaching tool that provides guidance for activities and structured steps for completing assignments, thus helping students build a gradual and meaningful understanding of geometric concepts (Said et al., 2023). For effective implementation, the development of the student worksheet must be aligned with the Learning Objectives to be achieved and designed based on pedagogical principles that support active student engagement in the learning process.

The ethnomathematics-based *Lembar Kerja Peserta Didik* (LKPD), which integrates local culture into the material of plane shapes through the cultural context of Jihat Ninek Depati Intan Kemalo Sari, is one of the innovative efforts to connect mathematics learning with students' real-life experiences. LKPD, as a learning resource designed to guide students through structured activities, plays an important role in facilitating students' understanding of mathematical concepts. In this context, LKPD is equivalent to a student worksheet, as both refer to instructional materials that contain tasks, instructions, and activities aimed at supporting the learning process (Saltifa et al.,

2023; Sari et al., 2023). Other research also shows that integrating local culture into student worksheet plays a crucial role in connecting abstract mathematical concepts with students' real-life experiences, thereby making the learning process more meaningful (Zahra et al., 2025). Furthermore, research on regional culture-based teaching materials confirms that utilizing cultural context can enrich the learning experience and enhance appreciation of local wisdom (Luthfi & Rakhmawati, 2022).

However, previous studies still tend to emphasize general cultural contexts and have not specifically explored the richness of meaning contained in the Jihat Ninek Depati Intan Kemalo Sari cultural site. Most studies only use cultural elements as contextual examples and have not transformed them into a structured LKPD design that systematically integrates cultural philosophy, spatial organization, and geometric patterns into plane geometry learning (Pratiwi & Pujiastuti, 2020). In addition, these cultural elements have not been aligned with clear pedagogical frameworks and learning objectives, resulting in a lack of coherence in supporting students' conceptual understanding (Armanza & Asyhar, 2020).

Moreover, the context of Jihat Ninek Depati Intan Kemalo Sari is not only important from a local perspective but also holds significant scientific value. This cultural site represents a complex system of spatial structures, geometric patterns, symmetry, and proportional reasoning, which are fundamental concepts in mathematics, particularly in plane geometry (Asdar et al., 2025). The philosophical values embedded within it, such as balance, harmony, and order, reflect universal mathematical principles that can be studied academically. Therefore, this context provides an authentic representation of how mathematical concepts are embedded in real-life cultural practices and offers a meaningful way to bridge abstract mathematical ideas with students' experiential understanding (Utama et al., 2024).

Therefore, this study aims to Development of an Ethnomathematics-based LKPD on Local Cultural of Jihat Ninek Depati Intan Kemalo Sari on the Material Flat Shapes. By linking the concept of plane figures with geometric elements in the philosophy of the tradition, it is hoped that students will not only be able to understand mathematical concepts more deeply, but also experience a more meaningful learning process through the use of the local cultural contexts as a learning resource.

## METHOD

This research employed the Research and Development (R&D) method with the Plomp development model, which consists of three main stages: preliminary investigation, development, and evaluation (Plomp, 2013). This model was chosen because it is suitable for producing valid and practical learning tools through systematic

steps.

The research was conducted in the odd semester of the 2025/2026 academic year, with a limited trial of the learning tools at SMP Negeri 14 Kerinci (State Junior High School 14 Kerinci), located in Kayu Aro Barat District, Kerinci Regency, Jambi. The initial investigation phase was conducted in Siulak Mukai Hamlet, Kerinci Regency, Jambi, specifically to gather information related to the Jihat Ninek Kemalo Sari culture through interviews with local traditional leaders and educators. The research subjects in the limited trial included 26 ninth-grade students of SMP Negeri 14 Kerinci in the 2025/2026 academic year.

**Research Procedure**

This research procedure uses the Plomp development model, which consists of three main stages: Preliminary Investigation, Development, and Evaluation (Plomp, 2013), as described below.

1. Preliminary Investigation: The initial investigation stage analyzes learning needs and examines the cultural philosophy of Jihat Ninek Kemalo Sari and its relationship to the concept of geometric shapes. The results of this stage are used as the basis for designing ethnomathematics-based worksheet to suit student characteristics and the local cultural context.
2. Development: The development stage includes the preparation and design of an ethnomathematics-based worksheet prototype. The worksheet is designed by integrating geometric concepts of geometric shapes with the values of balance and order inherent in the Jihat Ninek Kemalo Sari culture. At this stage, expert validation is conducted as part of the development process to assess the feasibility of the worksheet before its pilot testing. The validation process was conducted by three validators: two mathematics education lecturers acting as subject matter experts and one learning media expert, and one mathematics teacher who provided assessments based on practical classroom learning experiences. The validation results were used as the basis for revisions before the limited trial.
3. Evaluation: The evaluation phase aims to assess the validity and practicality of the student worksheet. The validity of the student wokrsheet was determined through expert assessment using a validation sheet covering didactic aspects, material or content, language, and presentation, with indicators developed based on teaching materials development theory and LKPD characteristics. The practicality of the LKPD was determined through questionnaires administered to both teachers and students. The results were then analyzed in the form of percentages to assess the level of practicality of the LKPD.

This study is limited to the stages of validity and practicality testing and does not

include effectiveness testing. This limitation is due to the focus of the research, which is on developing and refining the learning product using the Plomp development model, particularly in ensuring the feasibility and usability of the developed LKPD. Effectiveness testing requires broader implementation, longer classroom intervention, and the use of an experimental research design to measure its impact on students' learning outcomes. Therefore, effectiveness testing is beyond the scope of this study and is recommended for future research.

**Data Analysis Techniques**

Data analysis techniques were carried out using validity and practicality tests for the student wokrsheet, as follows:

a. Validity Test

Data from the instrument validation were analyzed using quantitative descriptive methods using the Aiken index. The student wokrsheet assessment criteria were obtained based on a validation sheet using a scoring guideline with a 4-category Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The formula used is:

$$V = \frac{\sum s}{n(c-1)}$$

where:

$V$ = assessor agreement index regarding item validity
$s$ = assessor score minus the lowest score in the category
$n$ = number of assessors
$c$ = number of assessment categories

After calculations using this formula, conclusions were drawn based on the results obtained. The percentage criteria from these calculations are presented in Table 1 below (Putri et al., 2025).

**Table 1.** Validity Criteria

| NO | Score | Criteria |
|---|---|---|
| 1 | $V > 0{,}8$ | High validity |
| 2 | $0{,}4 \leq V < 0{,}8$ | Moderate validity |
| 3 | $V < 0{,}4$ | Low validity |

b. Practicality Test

Practicality data were determined based on the questionnaire completed by teachers and students using a scoring guideline with a 4-category Likert scale: 1 = strongly disagree, 2 = disagree, 3 = agree, and 4 = strongly agree. The data obtained were then analyzed using the percentage formula:

$$P = \frac{R}{SM} \times 100\%$$

where

$P$ = practicality percentage

$R$ = total score obtained

$SM$ = maximum score

After calculations using this formula, conclusions were drawn based on the results. The percentage criteria from these calculations are presented in Table 2 (Milala et al., 2022).

**Table 2.** Practicality Criteria

| No | Achievement Level (%) | Criteria |
|---|---|---|
| 1 | $85 \leq P \leq 100$ | Very practical |
| 2 | $75 \leq P < 85$ | Practical |
| 3 | $60 \leq P < 75$ | Quite practical |
| 4 | $55 \leq P < 60$ | Not very practical |
| 5 | $0 \leq P < 55$ | Not very practical |

## RESULTS AND DISCUSSION

### Results

This research resulted in a learning tool in the form of ethnomathematics-based *Lembar Kerja Pesera Didik* (LKPD) that highlight the local culture of Jihat Ninek Depati Intan Kemalo Sari on Material of plane shapes. The developed an LKPD not only aims to facilitate students' understanding of abstract mathematical concepts but also to link learning to local wisdom values, thus making the learning process more meaningful. This integration of culture into learning aligns with D'Ambrosio's (2001) view that ethnomathematics can be a means of connecting school mathematics with community cultural practices, so that students feel closer to the material being learned (Gunawan, Mukhaiyar, et al., 2022).

### Initial Investigation Phase

The initial investigation phase is the first stage in the Plomp development model. It aims to identify learning needs and formulate the foundation for designing learning tools that align with the curriculum, student characteristics, and the local cultural context. In this phase, information was gathered through analysis of curriculum documents, observations of the teaching and learning process, and direct observation with mathematics teachers at SMPN 14 Kerinci. The results are described as follows:

1. Curriculum Analysis: The curriculum analysis was conducted by reviewing the Independent Curriculum documents, particularly the Learning Outcomes (CP) and Learning Objectives (TP) in ninth-grade mathematics related to plane geometry. The analysis shows that the learning objectives highlight students' abilities to understand

the basic principles of plane geometry, calculate the perimeter and area of various geometric shapes, and relate these concepts to problems frequently encountered in everyday life. Furthermore, the learning process aims to strengthen the Pancasila Student profile, particularly in critical and creative thinking. Considering these learning objectives, it is crucial to have teaching materials that support active, contextual, and meaningful learning activities for students.

2. Student Analysis: The student analysis focused on general characteristics related to student worksheet creation, rather than evaluating individual cognitive abilities. Based on observations of the learning process and information from teachers, ninth-grade students at SMP Negeri 14 Kerinci exhibit diverse academic abilities and require gradual support to understand mathematical concepts. Students are more likely to understand material better when presented with concrete examples, images, and relevant situations, as well as through activities that encourage exploration and discussion. Therefore, student worksheets are designed with structured steps and empower students to construct their own understanding.
3. Material Analysis: The material analysis covered the topic of plane geometry, which includes isosceles triangles, rectangles, rhombuses, and semicircles, with an emphasis on the concepts of shape, perimeter, and area. Research on local culture indicates that the Jihat Ninek Depati Intan Kemalo Sari site possesses various ethnomathematic elements, including geometric patterns in roof and door carvings, symmetry, and ideas about spatial order and balance. These elements are directly related to the concept of plane geometry and can be used as context for mathematics learning. Integrating local culture aligns with the principles of contextual education, which emphasize the relationship between mathematics and everyday life (Habibi, 2025), and the concept of ethnomathematics, which considers mathematics as a cultural product of value to students (Gustia & Putra, 2024). Therefore, the material on plane shapes is considered suitable for development in an ethnomathematics-based worksheet format.

Based on the results of the initial investigation phase, it can be concluded that the development of an LKPD (*Lembar Kerja Peserta Didik*) based on the local ethnomathematics of Jihat Ninek Depati Intan Kemalo Sari culture in plane geometry material is essential to support relevant, meaningful, and student-centered mathematics learning for grade IXB students. Curriculum analysis indicates that mathematics learning in the Independent Curriculum emphasizes conceptual understanding, contextual problem-solving skills, and strengthening the Pancasila Student Profile, thus requiring teaching materials that encourage active student involvement (Nurani & Susanti, 2025). The results of the student analysis indicate diverse characteristics. The diverse

characteristics of students, which require gradual guidance through visual activities, demonstrate the importance of worksheets with structured activity steps. Furthermore, the analysis of the local culture of Jihat Ninek Depati Intan Kemalo Sari revealed ethnomathematics elements relevant to the concept of plane shapes, such as geometric patterns, symmetry, and the principles of balance and spatial order, which can make learning more meaningful and relevant to students' experiences. Therefore, the results of this initial investigation phase serve as the foundation for entering the development phase, namely the design and development of ethnomathematics-based student worksheets in accordance with the research objectives.

**Development**

1. Initial Design: The initial design phase of the LKPD included the preparation of the cover design and layout using Microsoft Word, showcasing the cultural elements of Jihat Ninek Depati Intan Kemalo Sari, an ancestral site in Siulak Mukai Hamlet, Kerinci. The initial design also included an introduction on each page linking local culture to ethnomathematics, such as geometric patterns in plane shapes, to connect cultural heritage with modern mathematical concepts. The design of the front page of the LKPD and the layout of each page can be seen in Figure 2.


**Figure 2.** Front Cover and Pages

2. Format Selection: The developed LKPD format includes a front cover and an introduction that presents an overview of the local culture of Jihat Ninek Depati Intan Kemalo Sari. Material related to plane shapes is developed by connecting geometric ideas with the ethnomathematics context of Jihat Ninek Depati Intan Kemalo Sari, thus reinforcing relevant and meaningful learning.

## Evaluation

This evaluation involved two steps: product validation by lecturers and mathematics teachers, and practicality testing by students and teachers.

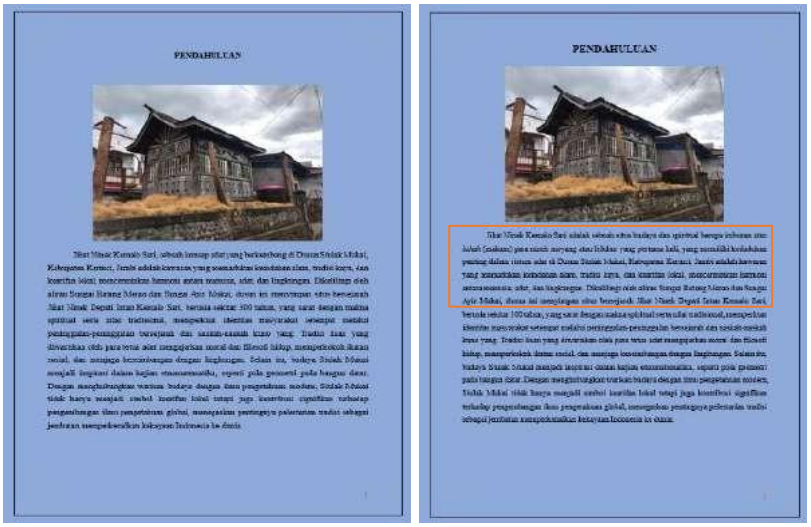
1. Expert Validation: The validation process involved three expert validators. The validation results are shown in Table 3.

**Table 3.** Validation Test Results

| Assessment Items | Lecturer 1 | Lecturer 2 | Teacher | ∑s | V |
|---|---|---|---|---|---|
| Didactic Aspect | 3 | 3 | 4 | 7 | 0,78 |
| Material/Content Aspect | 3 | 4 | 4 | 8 | 0,89 |
| Language Aspect | 4 | 3 | 3 | 7 | 0,78 |
| Presentation Aspect | 3 | 4 | 4 | 8 | 0,89 |
| **Average** | | | | | **0,84** |

Based on the validation sheet analysis, the average score for all aspects of the Kerinci culture-based LKPD was 0.84, based on the high validity criteria used (Putri et al., 2025). This score falls within the high validity category; therefore, the developed LKPD can be declared valid and feasible for use. After the validation process conducted by the validators, several suggestions and recommendations were obtained, which were then used as references to revise and improve the LKPD before proceeding to the trial phase.

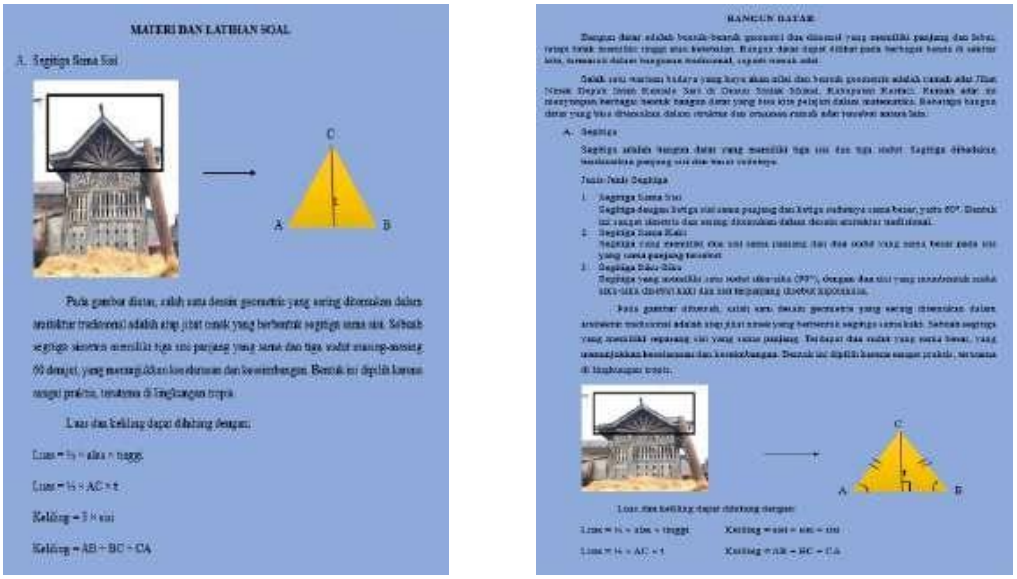
a. Improvements to the introduction still do not include an explanation of Jihat Ninek Depati Intan Kemalo Sari. A brief description should be added to help readers understand the cultural context being addressed. An example of the improvements can be seen in Figure 3.




(a) (b)

**Figure 3.** (a) Introduction Before Revision and (b) Introduction After Revision

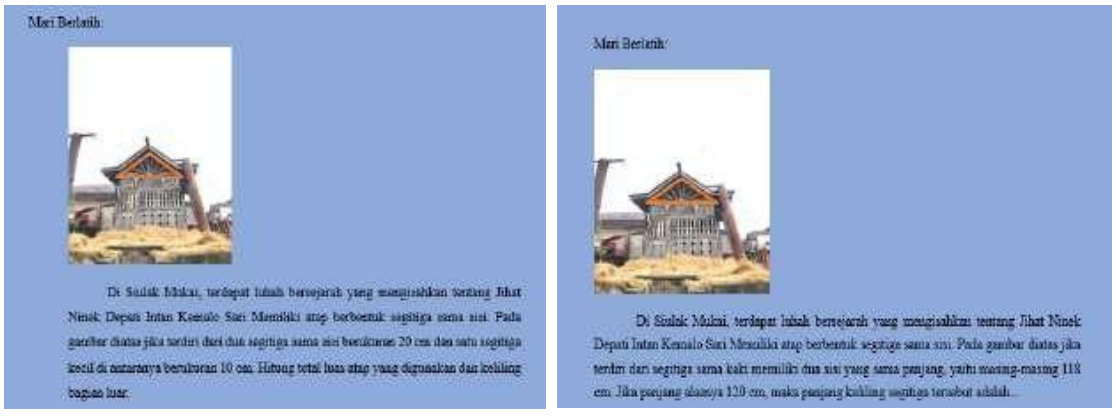
b. Improvements to the material and practice questions were made by replacing or adding topics on plane shapes, along with an introduction to the concept of triangles, including equilateral triangles, isosceles triangles, and right triangles. An example of the improvements can be seen in Figure 4.




(a) (b)

**Figure 4.** (a) Plane Shape Before Revision and (b) Plane Shape After Revision

c. Improvements to the flat shape of an equilateral triangle need to be taken into account, whether it really is an equilateral triangle or was originally an arbitrary triangle or isosceles. Apart from that, in Let's practice, realistic measurements should be used and presented in full so that it is clearer. An example of improvement can be seen in Figure 5.

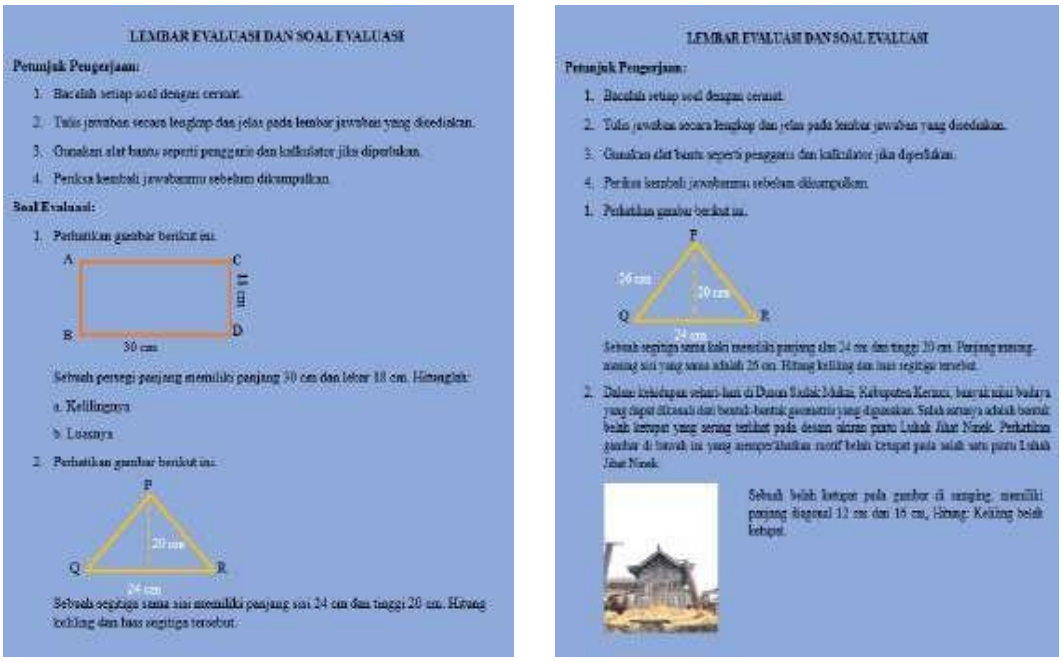



(a) (b)

**Figure 5.** (a) Let's Practice Before Revision and (b) Let's Practice After Revision

d. Improvements were made by replacing the word problems with just two problems on

the evaluation sheet. An example of the improvements can be seen in Figure 6.




(a) (b)

**Figure 6.** (a) Evaluation Questions Before Revision and (b) Evaluation Questions After Revision

## Practicality Test

After the product was declared valid, the subsequent stage involved conducting a pilot test with students. The pilot test was conducted in a single class consisting of 26 students over two meetings. Each meeting addressed two subtopics, and the student response questionnaire was administered at the end of the second meeting. This practicality test aimed to examine students' perceived benefits after using the ethnomathematics-based LKPD. The results of the practicality test, derived from the student response questionnaire, are presented in Table 4.

**Table 4.** Practicality Test Results

| Respondents | Total Score | Ideal Score | $P = \frac{R}{SM} \times 100\%$ |
|---|---|---|---|
| Students | 1.260 | 1.456 | 87% |
| Teachers | 42 | 56 | 75% |
| Practicality Results | | | 81% |

Based on the results in Table 2, the practicality level of the LKPD reached 81%, which falls into the "practical" category (Milala et al., 2022). Furthermore, based on the results presented in Tables 1 and 2, it can be concluded that the ethnomathematics-based LKPD on local culture of Jihat Ninek Depati Intan Kemalo Sari on material flat shapes has met

the criteria of validity and practicality.

**Discussion**

The study shows that the validity of the student worksheet (LKPD) based on the local cultural ethnomathematics of Jihat Ninek Depati Intan Kemalo Sari on the material of flat shapes was obtained from the validator's assessment with an average validation score of 0.84, which is included in the high validity category. This validity indicates that this worksheet has met the eligibility standards in terms of didactic aspects, material content, language, and presentation (Ariani et al., 2025). The learning activities contained in the worksheet are arranged systematically and contextually by connecting the concept of plane geometry with local culture, so that it is in line with the learning objectives set in the Independent Curriculum and encourages active and student-centered learning. Improvements made based on suggestions from validators, such as adding explanations regarding the cultural context and improvements to the triangle material, further strengthen the conceptual accuracy and clarity of the worksheet presentation in accordance with the criteria for valid learning tools (Putri et al., 2025). The revised LKPD developed in this study is feasible to be used and can be accessed through the following Google Drive link. https://drive.google.com/drive/folders/1-NH8GjK7lkKkZuagmScwS2_AgXH9JLXU.

Furthermore, the validity of the student wokrsheet also demonstrates the application of the principle of constructive alignment, namely the alignment between learning objectives, activities, and assessments. The assessments contained in the LKPD are designed to authentically assess students' conceptual understanding, while learning activities encourage students to construct knowledge through real-life experiences and social interactions (Armanza & Asyhar, 2020). The design of this student wokrsheet is based on the constructivist theory of Piaget and Vygotsky, which asserts that effective learning occurs when students actively develop knowledge from meaningful contexts (Arafah et al., 2023). Thus, the student wokrsheet is not only valid in terms of content but also pedagogically and theoretically valid in supporting relevant and culturally relevant mathematics learning.

Furthermore, the practicality test showed that the student worksheet achieved a practical score of 81%. The practicality of the LKPD was reflected in the positive responses from both teachers and students, indicating that it was easy to use, provided clear activity instructions, presented a systematic learning sequence, and featured an attractive and comprehensible design, thereby supporting the learning process (Pangestuti et al., 2025). A learning tool can be considered practical if it is easy to implement in the classroom and helps teachers and students conduct the teaching and learning process effectively (Ulya et al., 2025). Furthermore, the presentation of contextual problems that

connect the concept of plane shapes with the cultural traditions of Jihat Ninek Depati Intan Kemalo Sari makes the learning process more meaningful and increases student motivation and participation. This aligns with research findings showing that ethnomathematics-based LKPD can increase student enthusiasm for learning and active engagement because it offers learning experiences related to everyday life (Cahya & Siregar, 2023).

Theoretically, the results of this study reinforce D'Ambrosio's (2001) view that ethnomathematics can be a bridge between school mathematics and community cultural practices. The integration of Jihat Ninek Depati Intan Kemalo Sari's cultural elements in learning about plane shapes proves that students find it easier to connect new knowledge with cultural experiences they are already familiar with. This emphasizes that ethnomathematics not only functions as a medium for contextualizing concepts but also as a means to preserve local cultural values amidst modern learning. According to (Blegur, 2023; Iriandre et al., 2025) who stated that cultural activities such as counting, measuring, designing, and explaining are forms of universal mathematical activities that can be used as learning resources. Thus, ethnomathematics-based LKPD not only strengthens students' academic abilities but also contributes to the preservation and introduction of local cultural values.

This kind of culture-based learning also contributes to strengthening the Pancasila student profile, particularly in the dimensions of faith, global diversity, and mutual cooperation. Learning within the Independent Curriculum should develop students' full potential, encompassing knowledge, skills, and character (Ferdi et al., 2025; Kemendikbudristek, 2022). As students learn the values embodied in the Jihat Ninek Depati Intan Kemalo Sari culture, they learn to appreciate ancestral traditions, foster a love for local culture, and understand the connection between cultural values and knowledge. Thus, ethnomathematics-based LKPD serve not only as a cognitive learning medium but also as a means of character development, in line with the spirit of the Independent Curriculum (Adinda et al., 2025).

However, its implementation faces several challenges that require attention. First, not all students are deeply familiar with the Jihat Ninek Depati Intan Kemalo Sari culture, so teachers need to provide an introduction before linking it to mathematical concepts. Second, some teachers are not yet accustomed to integrating culture into learning, requiring training and mentoring to optimize the use of student worksheets. Third, limited learning time prevents comprehensive exploration of ethnomathematics. This obstacle was also found in similar studies, where the implementation of ethnomathematics in schools often requires adaptation of the curriculum and learning strategies to suit the local context and the available time (Bustaren et al., 2025).

In general, the advantages of the developed student wokrsheet include: (1) an attractive design with a combination of colors, images, and illustrations of local culture; (2) it facilitates teacher implementation; (3) it connects the concept of geometric shapes with the cultural values of Jihat Ninek Depati Intan Kemalo Sari; and (4) it meets the criteria of validity and practicality after undergoing validation and testing. However, this study has limitations because the testing was only conducted in one class with 26 students. In addition, this research did not include effectiveness testing. Therefore, further research is needed involving a wider range of subjects and testing in diverse school contexts, as well as examining the effectiveness of the developed of an LKPD in improving students' learning outcomes and mathematical understanding to obtain more comprehensive results and stronger generalizations.

## CONCLUSION

Based on the research results, it can be concluded that the development of local culture-based ethnomathematics of Jihat Ninek Depati Intan Kemalo Sari on the material of plane figures has been successfully implemented in accordance with the research objectives stated in the introduction. The designed LKPD meet the standards of validity and practicality, as seen from the validation results by experts with an Aiken index reaching 0.84 (in the high validity category) and the results of the practicality test reaching 81% (in the practical category), so they are suitable for application as a mathematics learning tool. The integration of local cultural elements in the LKPD can connect abstract plane figure concepts with students' cultural experiences, making the learning process more contextual, meaningful, and increasing students' active involvement and contributing to strengthening the Pancasila Student Profile in accordance with the principles of the Independent Curriculum. These findings pave the way for further development of ethnomathematics-based LKPD on other mathematics materials and various levels of education, and encourage further research to test their effectiveness in improving learning outcomes, critical thinking skills, and students' appreciative attitudes towards local culture with a wider range of subjects.

## REFERENCE

Adinda, S. B., Firdaus, H. P. E. F., & Fatqurhohman. (2025). Pengembangan LKPD berbasis etnomatematika pada arsitektur pura mandhara giri semeru agung melalui transformasi geometri. *Mandalika Mathematics and Education Journal*, 7, 691–704. https://doi.org/10.29303/jm.v7i2.9218

Aini, I. N., Prihaswati, M., & Suprayitno, I. J. (2025). Media pembelajaran interaktif pendekatan etnomatematika budaya jawa terhadap hasil belajar siswa materi geometri. *Jurnal Pengabdian Masyarakat dan Riset Pendidikan*, 4(1), 4398–

4408. https://doi.org/10.31004/jerkin.v4i1.482

Arafah, A. A., Sukriadi, & Samsuddin, A. F. (2023). Implikasi teori belajar konstruktivisme pada pembelajaran matematika. *Jurnal Pendidikan MIPA*, 13(2), 358–366. https://doi.org/10.37630/jpm.v13i2.946

Ariani, D., Nadila, Rahayuningsih, V. P., Andriyani, Y., & Revita, R. (2025). Uji validitas LKPD berbasis *problem based learning* untuk memfasilitasi kemampuan pemecahan masalah siswa SMP/MTS pada materi bangun ruang sisi datar limas. *Jurnal Pendidikan Sosial dan Humaniora*, 4(3), 5825–5836.

Armanza, R., & Asyhar, B. (2020). Pemahaman konseptual dan prosedural siswa SMA/MA dalam menyelesaikan soal program linier berdasarkan tipe kepribadian. *Jurnal Tadris Matematika*, 3(2), 163–176. https://doi.org/10.21274/jtm.2020.3.2.163-176

Asdar, Shalsyabila, Z., Busran, N. L., Angraini, M. A., Ramadani, C., & Hidayat, M. A. (2025). Etnomatematika pada menhir kalimbuang bori: geometri dan simetri dalam warisan budaya toraja. *Proximal*, 8, 1265–1272. https://doi.org/10.30605/proximal.v8i4.7637

Blegur, I. K. S. (2023). Matematika dan budaya: rancangan masalah pola bilangan dengan menggunakan tenun ikat amarasi barat. *Mandalika Mathematics and Education Journal*, 5, 123–135.

Bustaren, B. C. R., Priatna, N., Putri, N. S., & Ulfa, N. (2025). Analisis perspektif guru matematika SMP di kabupaten bogor terhadap STEM *challenge* sebagai asesmen dalam pembelajaran matematika. *Afore: Jurnal Pendidikan Matematika*, 4(1), 110–124. https://doi.org/10.57094/afore.v4i1.2901

Cahya, N., & Siregar, B. H. (2023). Pengembangan LKPD berbasis etnomatematika untuk meningkatkan kemampuan pemecahan masalah matematis siswa. *Jurnal Cendekia: Jurnal Pendidikan Matematika*, 7(3), 147-165. https://doi.org/10.33603/e.v10i1.8532

Cholid, Ahmadi, & Oktaviani, D. N. (2022). Analisis pemahaman konsep matematis pada siswa kelas X pada materi perbandingan trigonometri menggunakan model pembelajaran discovery learning. *Teorema: Teori dan Riset Matematika*, 7(1), 89–100. https://doi.org/10.25157/teorema.v7i1.5720

D'Ambrosio, U. (2001). What is ethnomathematics and how can it help children in schools?. *Teaching Children Mathematics*, 7(6), 308–310.

Ferdi, Thomas, & Falando, N. (2025). Evaluasi implementasi kurikulum merdeka dalam meningkatkan kreativitas dan kemandirian siswa. *Jurnal Pendidikan Indonesia: Teori, Penelitian dan Inovasi*, 5(3), 77–83.

Gunawan, R. G., Jamaris, J., Solfema, Oktariza, F., & Erita, S. (2022). An Ethnomathematics Exploration: The Beads Basket Craft Context for Mathematics Learning. *Edumatika : Jurnal Riset Pendidikan Matematika*, 5(2), 122–133. https://doi.org/10.32939/ejrpm.v5i2.1663

Gunawan, R. G., Mukhaiyar, & Ananda, A. (2022). Preferensi perilaku membolos dan alternatif pemecahannya pada siswa SMK humaniora kerinci. *At-Tarbawi: Jurnal Pendidikan, Sosial dan Kebudayaan*, 9(2), 194–209.

https://doi.org/10.32505/tarbawi.v9i2.5075

Gustia, R., & Putra, A. (2024). Aktivitas etnomatematika pada tari sekapur sirih di kerinci. *Venn: Journal of Sustainable Innovation on Education, Mathematics and Natural Sciences*, 3(1), 1–10. https://doi.org/10.53696/2964-867X.133

Habibi, M. I. (2025). Integrasi budaya dalam pembelajaran matematika : tinjauan pustaka sistematis tentang pendekatan etnomatematika. *Jendela Aswaja (JEAS)*, 6(2), 438–451.

Iriandre, R. A. P., Maharani, S., Darmadi, & Romandoni, H. R. (2025). Exploring ethnomathematics in junior high schools: indonesia ' s contribution and research clusters in enhancing 21st century skills. *Al-Ishlah: Jurnal Pendidikan*, 17(1), 1755–1765. https://doi.org/10.35445/alishlah.v17i1.5549

Kemendikbudristek. (2022). Dimensi , Elemen , dan Subelemen Profil Pelajar Pancasila.

Lubis, A. P., Sirait, C. D., Mailani, E., May, L. C., Ketaren, M. A., & Maharaja, S. (2024). Efektivitas pembelajaran matematika berbasis etnomatematika untuk penguatan nilai budaya. *Jurnal Matematika, Ilmu pengetahuan Alam, Kebumian dan Angkasa*, 2(5), 229–235. https://doi.org/10.62383/algoritma.v2i5.242

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, 07(1), 98–109. https://doi.org/10.31004/cendekia.v7i1.1877

Marlissa, I., Juandi, D., & Turmudi. (2024). Persepsi etnomatematika dalam pembelajaran matematika. *Jurnal Inovasi Pendidikan Matematika*, 7(1), 148–159. https://doi.org/10.31851/indiktika.v7i1.16993

Meika, I., Fitriyani, & Pratidiana, D. (2025). Pengembangan bahan ajar digital berbantuan flip PDF professional pada materi peluang untuk siswa SMA. *Math Educa*, 9(2), 106–120.

Milala, H. F., Endryansyah, Joko, & Agung, A. I. (2022). Keefektifan dan kepraktisan media pembelajaran menggunakan adobe flash player. *Jurnal Pendidikan Teknik Elektro*, 11(02), 195–202. https://doi.org/10.26740/jpte.v11n02.p195-202

Mirna, Mudjiran, Rohadatul, A., & Murni, D. (2023). Analisis pengaruh motivasi belajar terhadap pemahaman konsep matematis peserta didik. *Jurnal Muara Pendidikan*, 8(1), 96–107.

Monalisa, T., Nurusliah, & Oktafia, M. (2023). Pengembangan video tutorial menggunakan geogebra pada materi geometri. *Journal of Practice Learning and Educational Development*, 3(2), 139–147. https://doi.org/10.58737/jpled.v3i2.132

Nasution, E. Y. P., Suci Ika Putri, S., & Laswadi. (2024). Pengembangan LKPD berbasis geogebra pada materi dimensi tiga untuk mengembangkan pemahaman konsep matematis siswa. *Proximal: Jurnal Penelitian Matematika dan Pendidikan Matematika*, 7(2), 623–633. https://doi.org/10.30605/proximal.v7i2.3761

Nurani, D. A., & Susanti, E. (2025). Analisis implementasi pembelajaran menggunakan kurikulum merdeka belajar di kelas IV dalam pembelajaran matematika sekolah

dasar negeri 2 tanjung aman tahun ajaran 2024/2025. *Jurnal Griya Cendikia*, 10(2), 601–615. https://doi.org/10.47637/griyacendikia.v10i2.2008

Pangestuti, U. T., Sulistyaningsih, D., & Purnomo, E. A. (2025). Pengembangan E-LKPD berbasis CORE pendekatan etnomatematika pada materi relasi dan fungsi siswa kelas VIII. *Jurnal Ilmiah Profesi Pendidikan*, 10, 1002–1013. https://doi.org/10.29303/jipp.v10i2.3293

Plomp, T. (2013). *Educational Design Research: An Introduction*. Institute for Curriculum Development.

Pratiwi, J. W., & Pujiastuti, H. (2020). Eksplorasi etnomatematika pada permainan tradisional kelereng. *Jurnal Pendidikan Matematika Raflesia*, 5(2), 1–12. https://doi.org/10.33369/jpmr.v5i2.11405

Putri, A. A., Khairunisa, R. P., Amanda, S., Ramadhani, S., & Revita, R. (2025). Uji validitas LKPD berbasis *contextual teacing learning* untuk meningkatkan kemampuan pemecahan masalah siswa pada materi aritmatika sosial. *Phytagoras: Jurnal Pendidikan Matematika*, 2(3), 203–210. https://doi.org/10.70692/3wqctx13

Rohim, A., & Prayogi, B. T. (2023). Analisis kesulitan siswa dalam menyelesaikan soal aljabar ditinjau dari kemampuan berpikir logis. *Inspiramatika*, 9(1), 65–75. https://doi.org/10.52166/inspiramatika.v9i1.4446

Said, F. F., Susanto, A., & Utami, N. P. (2023). Pengembangan lembar kerja peserta didik (LKPD) berbantuan canva yang efektif. *Jurnal Ilmiah Soulmath: Jurnal Edukasi Pendidikan Matematika*, 11(1), 85–98. https://doi.org/10.25139/smj.v11i1.6020

Saltifa, I., Putri, R., & Gunawan, R. G. (2023). Pengembangan e-module interaktif menggunakan sigil pada materi pola bilangan. *Jurnal Ilmiah Pendidikan Matematika Al Qalasadi*, 7(2), 219–228. https://doi.org/10.32505/qalasadi.v7i2.5915

Sari, S. M., Yulia, P., & Rusliah, N. (2023). Aspek etnomatematika pada anyaman bambu desa bunga tanjung kabupaten kerinci. *Pythagoras: Jurnal Program Studi Pendidikan Matematika*, 12(1), 36–48. https://doi.org/10.33373/pythagoras.v12i1.5029

Sunliensyar, H. H. (2018). Asosiasi gundukan tanah, sungai, dan menhir di pusat wilayah adat tanah sekudung, baratlaut lembah kerinci, dataran tinggi jambi (kajian fenomenologi). Amerta, 36(2), 115. https://doi.org/10.24832/amt.v36i2.115-131

Turyani, I., Suharini, E., & Atmaja, H. T. (2024). Norma dan nilai adat istiadat dalam kehidupan sehari-hari di masyarakat. *Sosial: Jurnal Ilmiah Pendidikan IPS*, 2(2), 234–243. https://doi.org/10.62383/sosial.v2i2.224

Ulya, N. R., Rona, A., Widari, A., & Fadila, A. A. (2025). Peran sarana dan prasarana dalam mewujudkan lingkungan belajar yang efektif. *Proceedings Series on Social Sciences & Humanities*, 24(40), 99–105. https://doi.org/10.30595/pssh.v24i.1579

Utama, C., Ulya, M. Y. N., Miranda, V. J. Y., Oktavella, V. R. D., Jannah, Tsaniya Ro, I., & Larasati, F. (2024). Implementasi project based learning untuk

meningkatkan kemampuan berpikir matematis siswa sekolah dasar pada materi bangun datar terintegrasi STEM. *Pendas: Jurnal Ilmiah Pendidikan Dasar*, 09, 386–398. https://doi.org/10.23969/jp.v9i3.18729

Widyaningrum, R., & Prihastari, E. B. (2021). Integrasi kearifan lokal pada pembelajaran di sd melalui etnomatematika dan etnosains (ethnomathscience). *Jurnal Pengabdian kepada Masyarakat*, 5(2), 335–341. https://doi.org/10.31849/dinamisia.v5i2.5243

Zahra, N. A., Rohman, F., Handayani, I., Nurhanurawati, N., & Oktaviani, S. (2025). Pengembangan LKPD berbasis model *discovery learning* terintegrasi etnomatematika pola tapis lampung untuk melatih *critical thinking* peserta didik sekolah dasar. *Jurnal Caksana: Pendidikan Anak Usia Dini*, 8(1), 396–409. https://doi.org/10.31326/jcpaud.v8i1.2231