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THE DEVELOPMENT OF AN ACEH CULTURE-BASED ETHNOMATHEMATICS MODULE FOR ELEMENTARY SCHOOL

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Abstract

This study focuses on the development of an ethnomathematics module incorporating Aceh culture for Grade IV students at SDN 58 Banda Aceh. The aim is to create a culturally relevant learning resource that improves students' understanding of mathematical concepts, particularly quadrilaterals. Using the Research and Development (R&D) method with the ADDIE model, the study included a needs analysis, expert validation, and practicality assessments. The needs analysis revealed that existing materials lacked contextual relevance for students. The module meets the research objectives, with expert validation scores of 98.3% (media) and 90.55% (content), both categorized as *very feasible*. Practicality tests from teachers **(**93%**)** and students **(**91.8%**)** also show the module is *highly practical*, confirming its suitability for use in mathematics learning.The findings suggest that the Aceh culture-based ethnomathematics module is both feasible and practical for use in enhancing students' learning experiences

Keywords: Acheh Culture, Ethnomathematics, Module

Abstrak

Penelitian ini berfokus pada pengembangan modul etnomatematika yang menggabungkan budaya Aceh untuk siswa kelas IV SDN 58 Banda Aceh. Tujuannya adalah untuk menciptakan sumber belajar yang relevan secara budaya sehingga meningkatkan pemahaman siswa terhadap konsep matematika, khususnya segi empat. Menggunakan metode Research and Development (R&D) dengan model ADDIE, penelitian meliputi analisis kebutuhan, validasi ahli, dan penilaian kepraktisan. Analisis kebutuhan mengungkapkan bahwa materi yang ada kurang relevan secara kontekstual bagi siswa. Modul mendapat feedback positif dari para ahli, dengan validasi ahli media memperoleh skor 98,3% dan validasi ahli isi sebesar 90,55%, keduanya berkategori "sangat layak". Uji praktikalitas dengan guru dan siswa menunjukkan skor masing-masing sebesar 93% dan 91,8% yang menunjukkan tingginya kepraktisan modul. Temuan menunjukkan bahwa modul etnomatematika berbasis budaya Aceh layak dan praktis untuk digunakan dalam meningkatkan pengalaman belajar siswa.

***Kata kunci**: Budaya Aceh; Etnomatematika; Modul*

Ethnomathematics is an inter-disciplinary field of study that explores the relationship between culture and mathematics, emphasizing the appli-cation of mathematical concepts within specific cultural contexts. This field examines how mathematical ideas emerge, develop, and are utilized in various cultural traditions, shaping the way different societies approach mathematical thinking and problem-solving. According to d'Ambrosio, who is widely recognized as the Intellectual Father of the Ethnomathematical Pro-gram, "Ethnomathematics is practiced among cultural groups identified as

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national societies, indigenous communities, labor collectives, children of specific age groups, and professional classes. This perspective highlights the diverse manifestations of mathematical knowledge across cultural settings and underscores the importance of recognizing non-Western mathematical traditions in the broader discourse of mathematics education and research ((Khatimah et al., 2022); (Priyani, 2021)).

Ethnomathematics refers to a perspective on how mathematics is utilized in everyday life by various societal groups. It provides a lens through which mathematical concepts are seen as embedded within cultural practices and daily activities. Another perspective defines ethnomathematics as "a field of study that seeks to understand how mathematics is adapted from cultural traditions and serves as a means of expressing the relationship between culture and mathematics." This approach highlights the dynamic interaction between mathematical knowledge and cultural contexts, emphasizing that mathematical thinking is not limited to formal academic settings but is deeply rooted in the lived experiences of diverse communities ((Pathuddin et al., 2021); (Setyaningrum et al., 2024)).

According to Susanto et al. (2023) and also Musliana et al. (2024), ethnomathematics is a mathematical concept that is embedded within the culture of a specific group of people. This perspective emphasizes the study of mathematical ideas as they naturally emerge within cultural practices, traditions, and local knowledge systems. Ethnomathematics highlights the interconnectedness of mathematics and cultural heritage, demonstrating that mathematical thought is not solely a product of formal education but is also deeply rooted in the customs and everyday activities of various communities ((Acharya et al., 2021); (Firdaus & Hodiyanto, 2019); (Florentino et al., 2022); (Priyani, 2021)).

Therefore, ethnomathematics can be defined as a field of study that seeks to understand mathematical concepts as they emerge within a specific cultural context. It emphasizes the integration of mathematical knowledge with cultural practices, illustrating how mathematical ideas are shaped by and embedded in diverse traditions and ways of life.

One of the key factors in successful learning lies in the instructional materials used in the teaching process. Instructional materials refer to any content designed to assist educators in facilitating effective teaching and learning. According to Utami et al. (2018), instructional materials are a collection of facts, concepts, principles, procedures, and generalizations that are specifically designed to enhance the learning process. These materials play a crucial role in structuring lessons, providing students with clear guidance, and supporting educators in delivering knowledge effectively ((Khatimah et al., 2022); (Priyani, 2021); (Utami et al., 2018)). Instructional materials should be aligned with the characteristics of the *Merdeka Curriculum*, which emphasizes flexibility in learning and grants teachers, students, and school greater autonomy in organizing the teaching and learning process. Students are encouraged to acquire knowledge from various sources, including local cultural traditions. According to Utami et al. (2018), one of the objectives of developing instructional materials is to provide content that aligns with curriculum demands while considering

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students' needs specifically, materials that are tailored to their characteristics and social environment. This approach ensures that learning resources are relevant, contextual, and capable of fostering deeper engagement with both academic content and real-world applications. Enhancing learning effectiveness requires continuous updates and innovations in instructional materials. Adapting them to evolving educational needs ensures relevance, engagement, and better support for diverse learning styles.

Learning modules can serve as an alternative teaching material that meets the needs of both students and teachers. According to Pambudhi and Retnowati (2017), learning modules can serve as an alternative instructional material that meets the needs of both students and teachers. A module is an instructional material designed in a structured manner, containing a set of planned learning activities aimed at helping students achieve specific learning objectives. Modules provide a systematic approach to learning, ensuring clarity, coherence, and effective knowledge acquisition.

According to Anggoro (2015), learning with modules encourages students to enhance their learning abilities, problem-solving skills, and creativity. In this context, the teacher's role is primarily as a facilitator and evaluator, guiding students while allowing them to take greater responsibility for their own learning process. By using learning modules, educators can assess the extent to which students develop creative mathematical thinking in problem-solving. This approach enables students to better understand the material and achieve learning objectives.

There remains a gap in the literature regarding Piaget's theory, children aged 7–11 are in the concrete operational stage, where they begin to think logically about concrete events and develop problem-solving skills based on hands-on experiences ((Pakpahan & Saragih, 2022); (Sudianto & Ismayanti, 2023)).

Children's thinking abilities are still limited to concrete situations. Therefore, teachers must be able to present abstract mathematical concepts in a more tangible form to facilitate students' understanding. One effective approach is to develop instructional materials that connect learning with real-life situations familiar to students, making mathematics more accessible and meaningful.

Based on the preliminary observations conducted in Grade IV at SD Negeri 58 Banda Aceh, the researcher found that students struggled to comprehend the material in their textbooks. Additionally, the mathematics learning process appeared monotonous and unengaging. This was evident as students showed a lack of concentration, engaged in other activities during lessons, and paid little attention to the teacher's explanations. The learning approach primarily consisted of passive listening to lectures, copying example problems, and solving mathematical exercises, limiting student engagement and active participation.

Based on the needs analysis conducted by the researcher. Considering three aspects student needs, teacher needs, and curriculum analysis the findings revealed several key insights.

The curriculum analysis indicated that SD Negeri 58 has not yet fully implemented the *Merdeka Curriculum* across all grade levels, with its application currently limited to Grades 4, 5, and 6. The student needs analysis

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highlighted the necessity for instructional materials that are more contextual and engaging to create a more enjoyable and less monotonous learning experience. This is further supported by survey results, which showed that 75% of students struggled to understand the topic of quadrilaterals.

Figure 1 explains the aspects that are missing in the current Mathematics textbook on quadrilaterals, particularly the lack of contextual examples, the overly brief explanations, and the limited engaging visuals.

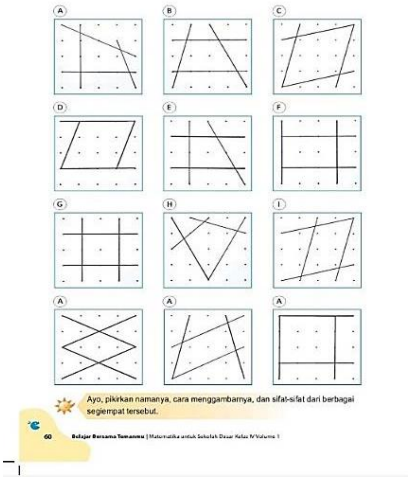

Figure 1. The grade IV Elementary School Mathematics Student Book

It is evident that the Mathematics student textbook for the quadrilateral topic lacks sufficient contextual examples, provides overly brief explanations, and contains limited engaging visual resources. These shortcomings make it difficult for students to understand the material, resulting in a monotonous and unengaging learning experience. Furthermore, the teacher needs analysis indicates that educators require supplementary instructional materials to support the learning process. This finding is reinforced by interviews with the Grade IV homeroom teacher, who stated that developing instructional materials is challenging due to its complexity and time-consuming nature. As a result, teachers have never developed additional learning materials, whether in the form of modules or other instructional resources.

Based on the issues outlined above, it is essential to introduce innovative approaches in mathematics education. One such approach is integrating mathematical concepts with cultural elements within instructional materials. This process of connecting mathematics learning with cultural aspects is known as ethnomathematics. Ethnomathematics offers a fresh perspective, demonstrating that learning mathematics extends beyond theoretical discussions in the classroom and can also be explored through local cultural contexts ((Ramadhani & Zainil, 2025); (Prahmana & D'Ambrosio, 2020); (Rakhmawati, 2016)). In the learning process, teachers are responsible for encouraging students to explore the diverse cultural knowledge they have acquired. By providing opportunities for all students to express their thoughts, teachers foster creative thinking and enable students to analyze mathematical concepts from their own cultural perspectives. Acehnese culture, for instance, can serve as a valuable medium for students to explore and understand mathematical concepts in a meaningful and contextualized manner. Acehnese culture is a unique and rich cultural heritage that remains well-preserved. Its traditional houses, characterized by distinctive architectural designs, and mosques adorned with intricate carvings rich in meaning and history, serve as strong symbols of Aceh's cultural identity ((Annisa, 2023); (Rahmi et al., 2023)).

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However, with the advancement of time and technology, students are becoming increasingly unfamiliar with their own culture. In reality, Acehnese culture contains numerous mathematical concepts that can be explored. For example, in the patterns of traditional Acehnese houses and the architectural design of the Baiturrahman Grand Mosque in Banda Aceh, various quadrilateral shapes can be identified.

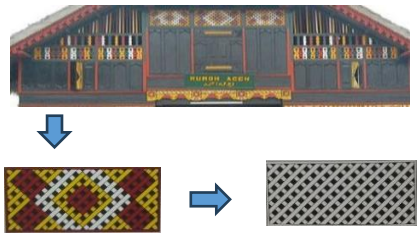

Figure 2. Rectangular Shapes on the Walls of Rumoh Aceh

Based on Figure 2, The Aceh Culture-Based Ethnomathematics Module serves as an alternative learning tool that makes mathematics both enjoyable and meaningful. By integrating mathematical concepts within the context of local culture, this module not only facilitates a deeper understanding of mathematical principles but also allows students to appreciate the richness of their own heritage.

Designed to be interactive, engaging, and systematic, the module features visual representations of Acehnese culture that relate to the topic of quadrilaterals. Additionally, it incorporates enjoyable student activities, creating a unique and meaningful learning experience. The introduction of this module is also an educational initiative aimed at preserving Acehnese culture. Beyond supporting academic learning, it fosters students' awareness of the importance of safeguarding and valuing their cultural heritage by connecting mathematical concepts with local traditions.

This aligns with the findings of Zuhra's research, which states that culture-based instructional materials serve as an effective solution to help students better understand mathematics. By incorporating cultural elements into learning resources, students can relate mathematical concepts to their everyday experiences, making the learning process more engaging and accessible (Ruhmi et al., 2019). The connection between mathematics and culture, derived from students' lived experiences, makes mathematics learning more meaningful and enjoyable. By relating mathematical concepts to familiar cultural contexts, students can better understand and appreciate the relevance of mathematics in their daily lives (Ruhmi et al., 2019).

This is also consistent with the research conducted by Khatimah et al. (2022) whose findings indicate that an ethnomathematics-based mathematics learning module has proven effective in teaching the topic of three-dimensional geometric shapes using the ethnomathematical context of Bugis culture. Previous studies demonstrate that integrating cultural elements into mathematics education can improve students' understanding and engage-ment. The validation results also show that the developed module is both valid and practical, supported by positive feedback from students and teachers, and followed by significant improvements in student learning outcomes (Khatimah et al., 2022).

Based on these findings, it can be concluded that ethnomathematics-based learning modules effectively facilitate students' comprehension of mathematical concepts while creating learning experiences that are enjoyable, meaningful, and culturally relevant.

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Although previous studies have shown that ethnomathematics-based learning modules can enhance students' understanding, engagement, and cultural appreciation, but these studies have primarily focused on general mathematical topics**.** However, there is still a lack of research that specifically develops an ethnomathematics-based materials for the quadrilateral topic**,** particularly those that address gaps in existing textbooks such as limi-ted contextual examples, overly brief explanations, and minimal engaging visuals.

The novelty of the present study lies in designing a culturally integrated quadrilateral learning module that not only strengthens conceptual understanding but also enriches students' learning experiences through contextual, meaningful, and visually engaging materials.

METHODS

This study employs a Research and Development (R&D) approach, aiming to produce a learning module based on ethnomathematics. This research used ADDIE model, consist of five stages: analysis, design, development, implementation, and evaluation. Figure 4. represents ADDIE model that used in this research cycle.

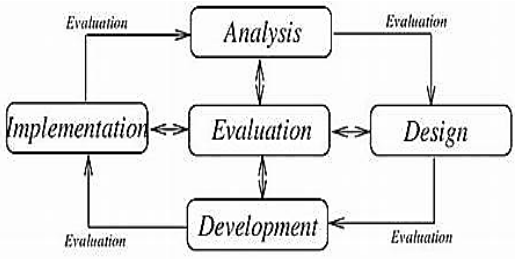

Figure 4. ADDIE Model

1. Analysis

The analysis stage is conducted to assess the learning environment and student conditions, highlighting the need for the development of an ethnomathematics module based on Acehnese culture. In this phase, the researcher analyzes needs by conducting field observations, reviewing the curriculum, distributing question-naires to students, and interviewing the classroom teacher.

The findings indicate that SDN 58 Banda Aceh has not yet fully implemented the *Merdeka* curriculum across all grade levels. Additionally, students struggle to understand quadrilateral concepts, as supported by questionnaire results showing that 75% of students face difficulties due to the lack of contextual and engaging content in their textbooks.

Furthermore, interviews with the teacher reveal that developing teaching materials is perceived as complex and time-consuming, preventing the teacher from creating instructional materials in the form of modules or other teaching resources.

2. *Design*

The second stage is the design phase. This phase begins with developing a product design based on the findings from the analysis phase. This module is designed in alignment with the *Merdeka* curriculum, and also includes several academic journals as references to guide the development of the ethnomathematics module rooted in Acehnese culture. Then, in this phase also arranged data collection instruments.

3. *Development*

At this stage, the focus is on making an ethnomathematics module based on Acehnese culture, transforming the previously developed design

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into a tangible product. The development phase involves several key activities, 1) Developing the Acehnese Culture-Based Ethnomathematics Module; 2) Conduct media and content validity test by validators until get a valid module.

4. *Implementation*

After undergoing several stages to identify the weaknesses of the Acehnese culture-based module developed by the researcher, the revised module adjusted based on feedback and critiques from validators is subsequently evaluated by teachers through a teacher practicality questionnaire.

Additionally, students assess the module using a student practicality questionnaire. This process ensures that both teachers and students can effectively utilize the final version of the Acehnese culture-based ethno-mathematics module developed by the researcher.

5. *Evaluation*

The evaluation stage is the final phase in the development of the ethnomathematics module. At this stage, the researcher conducts a final revision of the module based on the results of the previous product trials. If the teacher and student practicality questionnaires indicate that the product is practical for use, it can be concluded that the development process is complete. However, if the product is not yet fully refined, the trial results will serve as the basis for further improvements. This process ensures that the final version of the Acehnese culture-based ethnomathematics module is highly suitable for use.

The subjects of this study are as follows:

a. Four expert lecturers: two media experts to provide feedback on the instructional media and two subject matter experts to provide feedback on the content.
b. A fourth-grade mathematics teacher from SDN 58 Banda Aceh.
c. Students of fourth grade in SDN 58 Banda Aceh

The data collection instrument of this research consist of content validation sheets, media validation sheet, and practicality questionnaire for teacher and students. Validation sheets was used to obtain data on validators' assessments of the feasibility of the developed module, serving as a benchmark for researchers in revising the module. Beside that, the practicality questionnaire was used to get feedback from users (teacher and student) to ensure that suitable for use in learning activity. All the instruments was arranged by a Likert scale.

The data analysis technique used in this research is quantitative descriptive analysis. The validity and practicality level of the Aceh culture-based ethnomathematics module can be calculated using the following formula:

$$V \text{ or } P = \frac{\sum x_i}{\sum x} \times 100\% \qquad (1)$$

With V is score of validity, P is score of practicality, $\sum x_i$ is total score from validator/teacher/student, and $\sum x$ is maximum score. After that, the score of validity and practicality was categorized as the Table 1.

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Table 1. Rubric for categorization of validity and practicality

Percentage Range (%)	Validity Category	Practicality Category
81% ≤ Skor ≤ 100%	Very Valid	Very Practical
61% ≤ Skor ≤ 80%	Valid	Practical
41% ≤ Skor ≤ 60%	Fairly Valid	Fearly Practical
21 % ≤ Skor ≤ 40%	Less Valid	Less Practical
0%≤ Skor ≤ 20%	Not Valid	Not Practical

RESULTS AND DISCUSSION

The development of the Aceh culture-based ethnomathematics module are based on the ADDIE development model procedure, as follows:

1. ***Analysis***

At this stage, the researcher first conducts an analysis of the needs of students and teachers. Needs analysis is an activity carried out to determine learning needs and identify problems. This analysis phase aims to identify issues students face during the teaching and learning process. The needs analysis is conducted based on three aspects, as follows:

a) Curriculum Analysis

Based on the interview with the school principal, it was found that SD Negeri 58 Banda Aceh has not yet fully implemented the *Merdeka* curriculum. Only grades 4, 5, and 6.

b) Student's Need Analysis

Based on classroom observations in grade IV, it was found that students had difficulty understanding the material in the textbooks. This finding is supported by the survey results, which can be seen in Figure 5.

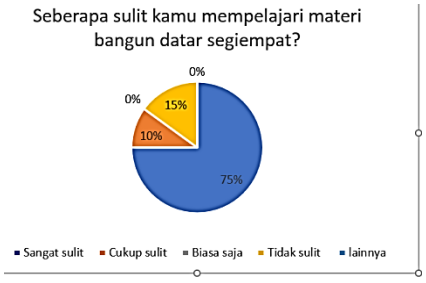

Figure 5 Difficulty in learning quadrilaterals

Based on Figure 5, 75% of student's experience difficulty in understanding the quadrilateral material. Additionally, the researcher observed that the mathematics learning process tends to be monotonous and unengaging.

c) Result of Teacher Need Analysis

Based on the results of the teacher needs analysis, it was found that teachers rely solely on printed textbooks as the primary learning resource and strongly require additional teaching materials to support the learning process. This finding is reinforced by an interview with a grade IV teacher, who stated that developing teaching materials is challenging due to its complexity and the significant amount of time required.

Based on the analysis above, the researcher aims to develop an Aceh culture-based ethnomathematics module for quadrilateral material with engaging, enjoyable, and contextual learning. Learning mathematics through their own culture is expected to make the learning process more meaningful.

2. Design

Based on the analysis results, the researcher will proceed with developing the ethnomathematics module following the established guidelines and module components.

a. Cover

The cover page illustrates the content that will be discussed in the Aceh culture-based ethnomathematics module.

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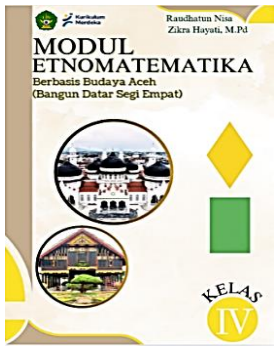

Figure 6. Cover

b. Preface

The preface contains a brief introduction to the module's content, the purpose of its development, and the expected benefits for students.

Figure 7. Preface

c. Table of Contents

The table of contents includes all the main sections of the module, arranged systematically and sequentially to help students understand the structure and content of the module more easily.

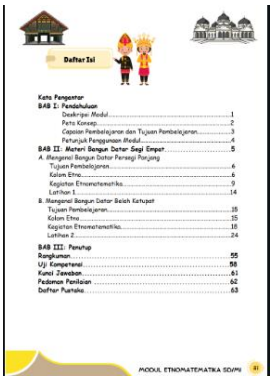

Figure 8. Table of Content

d. Module Introduction

The module description provides a brief overview of the content, objectives, and target audience of the Aceh culture-based ethnomathematics module.

3. Development

After making the Aceh culture-based ethnomathematics module based on design phase, then continue with validity test by experts. The following are the results of the validity test by experts.

Validity Test By Media Expert

The validity test was conducted by two expert lecturers. They Are Mulia, S.Pd.I., M.Ed. and Nazliati, M.Ed.The result of validity test by media experts can be seen in Table 1.

Table 1. Result of validity test by media experts

No	Indicator	Validity Result	Category
1	Module format	85%	Very Valid
2	Module organization	94,28%	Very Valid
3	Module appeal	93,33%	Very Valid
4	Font shape and size	95%	Very Valid
5	Module consistence	100%	Very Valid

Based on the Table 1, the overall percentage of media validity reached 94.13%, indicating that the Aceh culture-based ethnomathematics module is highly suitable for student learning.

Validasi Test By Content Expert

The validity test was conducted by two expert lecturers. They are Azmil Hasan Lubis, M.Pd. and Durratul Husna, S.Pd. The result of validity test by content experts can be seen in Table 2.

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Table 2. Result of validity test by content experts

No	Aspect of Validity	Validity Result	Category
1	Introduction	90%	Very Valid
2	Content	87%	Very Valid
3	Conclusion	96%	Very Valid

The overall percentage of content feasibility reached 90.55%, indicating that the Aceh culture-based ethnomathematics module is highly suitable for student learning.

a) Product Revise

Based on the validation results from media and content experts for the developed Aceh culture-based ethnomathematics module, the next step is for the researcher to revise the module according to the suggestions and comments provided by the validators, which include:

Validation of Media Expert

After the evaluation by the media experts, they gived comments and suggestions to revised. The result of the revition can be seen Table 3 and 4.

Table 3. Revition based on comments and suggestions of Media Expert 1

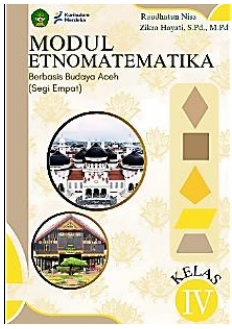
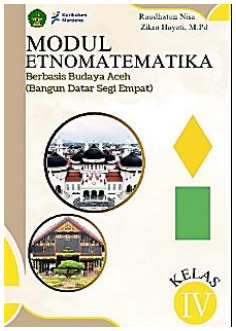
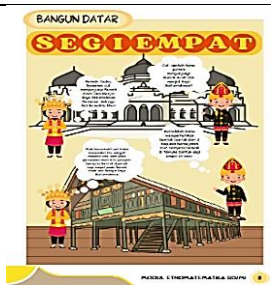
No	Aspect	Before revised	After Revised	Description
1	Font Type and Size			Before the revision, the font used was Times New Roman with a size of 12. According to Validator 1, this font and size were not suitable for elementary school students. There-fore, the researcher changed the font to Comic Sans with a size of 14.
	Cover			Before the revision, the cover design predomi-nantly used soft colors. The validator suggested replacing some of these soft colors with brighter ones, such as yellow and green. Addi-tionally, the validator recommended removing some plane shape images and eliminating the floral background.

Table 4. . Revition based on comments and suggestions of Media Expert 2

No	Aspect	Before revised	After Revised	Description
1	Introduction Section			Before the revision, the proportion of images and text in the intro-duction section was not well-balanced. Validator 2 suggested adjusting the layout of the images and text and replacing the soft colors with brighter ones.

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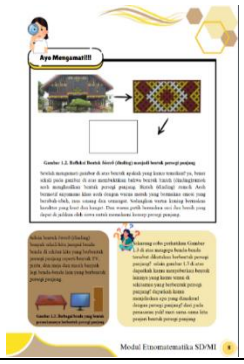
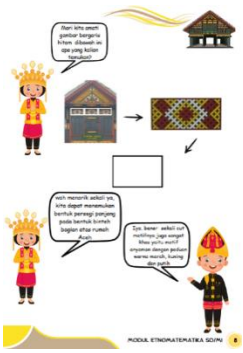
No	Aspect	Before revised	After Revised	Description
2	Picture Element			Before the revision, the placement of image elements was considered less appealing and not strongly related to Acehnese culture. Therefore, the validator suggested replacing them with images that better reflect Acehnese culture. Additionally, the validator recommended consistently including images of *Cut* and *Teuku* figures on each page and replacing images of uncovered children with ones wearing hijabs.
3	The Instruction Using Modul			Before the revision, the wording of the module usage instructions was too lengthy and complex, making it difficult for students to understand. Therefore, the validator suggested simplifying the sentences, incorporating images, and using concise, clear, and straightforward language.
4	Zoom Picture			Before the revision, the image of *Rumoh Aceh* was not zoomed in. The validator suggested enlarging the image to help students better understand its details and significance.

Validation of Content Expert

After the evaluation by the content experts, they gived comments and suggestions to revised. The result of the revition can be seen Table 5 and 6.

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Table 5. Revition based on comments and suggestions of Content Expert 1

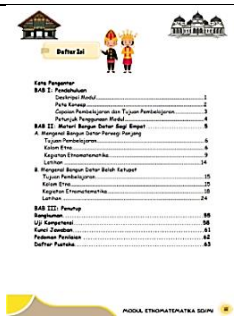
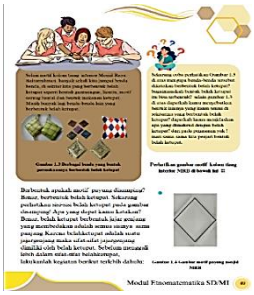
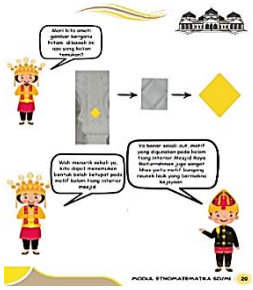
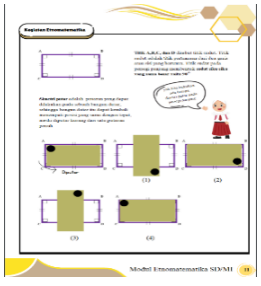
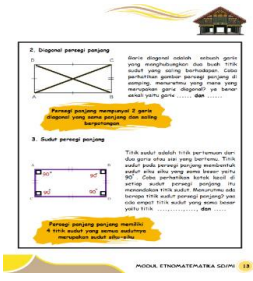
No	Aspect	Before revised	After Revised	Description
1	Table of Content			Before the revision, the table of contents in the module did not include dotted leader lines connecting to page numbers, and the pages were not num-bered. Therefore, the validator suggested adding page numbers and dotted leader lines to make it easier for students to locate specific sections in the module.
	Concept Part			Before the revision, the material section used exces-sively long sentences. Ac-cording to the validator, this was not suitable for fourth-grade elementary school students, as they tend to prefer visual content over lengthy paragraphs. There-fore, the validator suggested simplifying the language and emphasizing images to make the material easier for students to understand.

Table 6. Revition based on comments and suggestions of Content Expert 2

No	Aspect	Before revised	After Revised	Description
1	Column of ethno-mathema-tics part			Before the revision, the *etno story* column was too lengthy, and the sentences were difficult for elemen-tary school students to understand. Therefore, the validator suggested simpli-fying the story and using language that is easier for elementary school children to comprehend.
2	Ethnoma-tematics Activi-ties			Before the revision, the ethnomathematics activities were disorganized, and the content did not encourage students to understand the material, as it only presented information. Therefore, the validator suggested arran-ging the properties of the geometric shapes in a logical sequence and providing activities that would help students better understand the material, rather than just memorizing it.

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After revising the Aceh culture-based ethnomathematics module, it was evaluated by two grade 4 teachers and 20 grade 4 students at SD Negeri 58 Banda Aceh through a questionnaire.

Results of the Practicality Test by Teachers

The Aceh culture-based ethnomathematics module was assessed by two teachers of grade IV. The results of the practicality test by teacher can be seen in Figure 9.

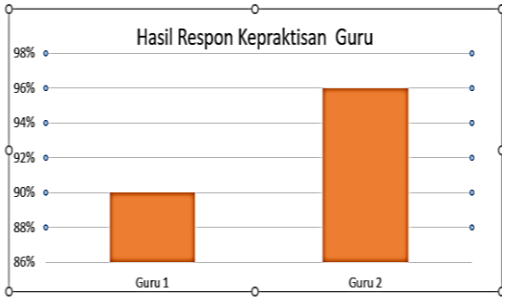

Figure 9. Results of the practicality questionnaire by teacher

Based on Figure 9, the percentage results from the practicality questionnaire responses by the teachers regarding the Aceh culture-based ethnomathematics module, Teacher 1 obtained a score of 100% with a "very practical" rating, and Teacher 2 received a score of 96% with a "very practical" category. Therefore, the overall practicality score from the teachers' responses to the module is 93%, classified as "very practical." Thus, based on the teachers' responses regarding the practicality of the Aceh culture-based ethnomathematics module developed by the researcher, it shows that the module is practical for use.

Results of the Practicality Test by Students

The Aceh culture-based ethnomathematics module was assessed by 20 grade IV students at SD Negeri 58 Banda Aceh. The results of the practicality test by students can be seen in Figure 10.

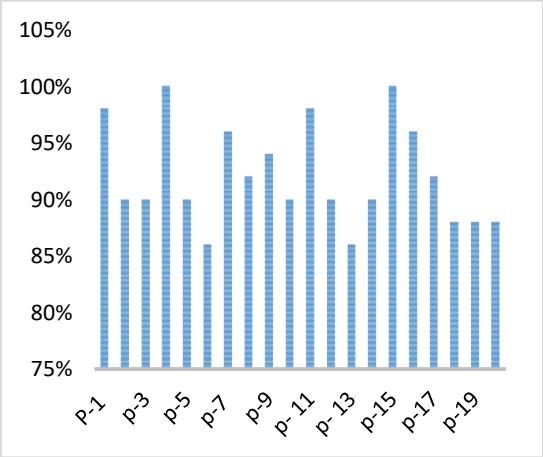

Figure 10. Results of the practicality test by student

Based on Figure 10, the percentage results from the students' practicality questionnaire responses regarding the Aceh culture-based ethnomathematics module, it was found that the overall practicality score from the students is 91.8%, classified as "very practical." Thus, based on the students' responses regarding the practicality of the Aceh culture-based ethnomathematics module developed by the researcher, it shows that the module is practical for use.

Ethnomathematics research in Indonesia has grown substantially, with many studies integrating cultural elements such as batik motifs, traditional houses, dances, and regional crafts into the teaching of mathematical concepts at the elementary level. These studies generally adopt a broad national approach**,** highlighting cultural practices from various regions including Java,

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Bali, Sunda, and others to demonstrate how local knowledge systems can support mathematics learning. However, despite this diversity, most research remains generalized**,** focusing on well-documented cultural artifacts or widely recognized traditions.

A notable limitation in previous research is the lack of deep, localized exploration of specific cultural contexts. While Balinese and Javanese ethnomathematical representations are frequently cited, the mathematical ideas embedded in Acehnese cultural practices have received far less attention. Prior studies often overlook the distinct symbolic systems, spatial representations, traditional measurement tools, and geometric structures present in Acehnese arts and daily activities.

This gap highlights the need for ethnomathematics research that goes beyond generalized Indonesian cultural elements to focus on context-rich, community-specific knowledge systems**.** As noted by some researchers ((Bidiyah et al., 2024); (Putri et al., 2023); (Liesandra & Nurafni, 2022); (Sugiono, 2020)).

This research can emphasize localized education that reflects Acehnese community values and learning styles, potentially using local dialects and practices. Overall, the narrative highlights the potential of my research to provide a unique contribution to ethnomathematics by focusing on Aceh's rich cultural heritage ((Amalia & Herawati, 2025); (Hayati, Munawwarah, et al., 2025); (Ulya & Hayati, 2020)).

Many studies on ethnomathematics have addressed the integration of cultural practices from various regions in Indonesia into mathematics education ((Hayati, Oviana, et al., 2025); (Jannah et al., 2025)), focusing on broader cultural examples. For instance, research has illustrated the application of Balinese and Javanese cultural elements in teaching mathematics, but often neglects specific local contexts, such as Aceh. My research can focus on deriving mathematical concepts from unique Acehnese arts, crafts, and daily practices. This can fill the gap in localized ethnomathematics content, emphasizing the distinct mathematical representations inherent in Acehnese cultural symbols ((Said et al., 2024); (Putri et al., 2023)).

CONCLUSION AND RECOMMENDATION

The results of the feasibility test show that the media expert achieved a percentage of 98.3%, classified as "very feasible," and the content expert achieved a percentage of 90.55%, also classified as "very feasible." The results of the practicality test show that the teachers' practicality questionnaire responses achieved a percentage of 93%, classified as "very practical," and the students' practicality questionnaire responses achieved a percentage of 91.8%, also classified as "very practical." It is recommended, learning ethnomathematics module can serve as an alternative teaching material that meets the needs of both students and teachers. Based on the result of this research, the next research should be continued to effectivity test. So this research can be used to solved the mathematics learning problem.

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