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Student Responses to Culture-Based Mathematics Learning in the Indonesian and Thailand Education Curricula

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Abstract

The aim of this research was to assess how students in Indonesia and Thailand react to ethnomathematics problems within their respective cultures. The participants consisted of 50 students in grades 7 to 12 from Indonesia and Thailand. Descriptive analysis techniques were employed in this study. Data were gathered using questionnaires, tests, and interviews. Subsequently, qualitative descriptive data analysis techniques such as Data Reduction, Data Presentation, Drawing Conclusions, and Verification were applied to analyze the collected data. The results showed that students presented positive responses to the given ethnomathematical problems. From the results of the questionnaire, about 76% showed an average very positive response to ethnomathematics, while the remaining 24% of students showed a moderately positive response to ethnomathematics. From the interview, students stated that students assume that ethnomathematics is interesting and challenging. Students' answers to the ethnomathematics test showed that they were unable to understand ethnomathematics and tended to work on planning and finally got the wrong results. This is because students who pay less attention to their cultural environment tend to acquire procedural mathematics learning. Therefore, teachers are expected to be able to develop more realistic mathematics learning by linking mathematical concepts with the real world.

Keywords: Descriptive Qualitative, Ethnomathematics, Indonesia, Student Responses, Thailand

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INTRODUCTION

Mathematics education places a strong emphasis on students' capacity to comprehend and address real-life problems. Aligned with the National Council of Teachers of Mathematics (NCTM, 2020), seven standards have been established for the mathematics learning process. These standards include: (1) Acquiring and Comprehending Mathematics; (2) Acquiring and Employing Mathematical Processes; (3) Understanding Students and Designing for Mathematical Learning; (4) Facilitating Meaningful Mathematics; (5) Evaluating the Impact on Student Learning; (6) Social and Professional Contexts of Mathematics Teaching and Learning; and (7) Secondary Field Experiences and Clinical Practice. Among these seven standards, an indication of students' success in mathematics lies in their ability to grasp mathematical concepts, utilize these concepts, and employ their thinking skills to solve practical problems.

Realistic Mathematics Education (RME), a specialized instructional theory for mathematics originating in the Netherlands, prioritizes the incorporation of rich and authentic scenarios within the learning process (Van den Heuvel-Panhuizen & Drijvers, 2020). This approach emphasizes the integration of practical, real-world situations to enhance mathematical understanding and engagement among learners. In line with this perspective, the mathematics classroom is not seen as a space where

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teachers simply transmit mathematical knowledge to students; instead, it is viewed as an environment where students actively rediscover mathematical ideas and concepts through the exploration of real-world issues. Within the framework of realistic mathematics learning, students engage in an 'informal situation,' starting with authentic problems, then proceeding to rediscover and construct their own concepts with the guidance of the teacher, and ultimately applying these acquired concepts to everyday problems or other domains (Romadoni & Rudhito, 2016).

Realistic mathematics is fundamentally about connecting students with their environment, emphasizing the importance of students understanding mathematics within the framework of their culture. At the heart of ethnomathematics is the idea of grasping mathematical concepts through cultural lenses. Ethnomathematics encompasses the mathematics practiced by diverse cultural groups, including urban and rural communities, labor groups, specific age groups, indigenous peoples, and others (Rachmawati, 2012). This approach seeks to investigate how students learn, communicate, process, and ultimately apply mathematical ideas, concepts, and practices to address challenges in their daily lives. Pathuddin et al. (2021) describe ethnomathematics as the exploration of the intricate relationship between mathematics and culture.

Ethnomathematics holds significance as it serves as both an indicator of achievement in realistic mathematics learning and a predictor of students' success in mathematics. In the era of the fourth industrial revolution, as highlighted by Darmayasa et al. (2019), ethnomathematics becomes crucial as it can act as a bridge between advancements in information and communication technology and the cultural heritage passed down through generations of Indonesians. Additionally, a person's cultural background plays a pivotal role in shaping their mathematical abilities, as their actions are often influenced by what they observe, feel, or experience in their immediate environment (Darmayasa et al., 2019; Zusmelia & Ariesta, 2016). Nur et al., (2019) and Awaliyah (2019) stated that ethnomathematics should be regarded as a curriculum component with its own standards aimed at enhancing students' mathematical abilities. Moreover, in the perspective of Prahmana and D'Ambrosio (2020), ethnomathematics in Indonesia extends beyond cultural research and experimentation in mathematics learning across various schools; it also holds the potential for integration into the national mathematics education curriculum in the future.

One of the most significant components of learning mathematics is students' ability to interpret mathematics in their own culture (Fouze & Amit, 2018). However, other changes, such as technical advancements and the digital era, have altered students' perceptions of traditional culture. Several ethnomathematics investigations have been conducted in Indonesia (Risdiyanti & Prahmana,; Supiyati et al., 2017; Wulantina & Maskar, 2019). Risdiyanti and Prahmana (2017) investigated the ideas of number operation and 2D forms in traditional games in Yogyakarta. Researchers also investigated geometry in Sasaknese architecture (Supiyati et al., 2019) and geometry in Lionese traditional dwellings. Furthermore, Wulantina & Maskar, (2019) discovered that students' responses to Lampungnese ethnomathematics-based mathematics teaching materials were characterized as good.

Furthermore, Simanjuntak and Imelda (2018) discovered that realistic mathematics teaching in the setting of Batak Toba culture was well received by pupils.

Southeast Asian countries with a strong cultural heritage include Indonesia and Thailand. Ethnomathematics methods are growing in these two countries because of their cultural variety. Prahmana and D'Ambrosio (2020) assert that ethnomathematics in Indonesia goes beyond mere cultural research and experimental implementation in a limited number of schools. They propose that ethnomathematics has the potential to be formally incorporated into the Indonesian mathematics education curriculum in the future. Suryanatha and Apsari (2013), for example, investigated the modulo idea found in the Bali naming system. In addition, Puspadewi and Putra (2014) investigated ethnomathematics in Bali woven crafts and its relationship to learning. In woven crafts, mathematical components include the concept of tiles, parallel lines, and angles.

The exploration of ethnomathematics in Thailand has extended to the realm of formal education, including its integration into school curricula. For instance, Suryana et al., (2022) delved into ethnomathematics regarding the five tones in Thailand music. Their study revealed that Thai tones could serve as a valuable subject for ethnomathematical investigations, particularly in the realm of mathematics learning related to curves and functions. This highlights the potential for exploring and applying culture-based mathematics in both Indonesian and Thailand educational settings. However, it is crucial to acknowledge that practical challenges and obstacles exist in implementing ethnomathematics in educational practices (Mania & Alam, 2021). Although previous research has made strides in incorporating ethnomathematics (Mauluah & Marsigit, 2019). There is a need to delve deeper into the specific challenges encountered. These challenges can be recognized as limitations in previous research, creating an opportunity to bridge theoretical gaps in the current study. Explicitly outlining the novel contributions of the present research in overcoming or addressing these challenges will enhance the utility and distinctiveness of the study compared to previous research. This approach ensures that the current research adds value by addressing and building upon the limitations and theoretical gaps identified in prior studies.

Because of the importance of ethnomathematics in learning, as well as the many obstacles that occur in the application of ethnomathematics, especially in countries rich in culture such as Indonesia and Thailand, according to researchers it is important to conduct research on "Student Responses to Culture-Based Mathematics Learning in the Indonesian and Thai Education Curriculum". Researchers hope that this research will be able to explore the perspectives of students in Indonesia and Thailand regarding the role of ethnomathematics and increase teachers' understanding of the importance of ethnomathematics in learning to increase the success of learning mathematics at school. The objectives to be achieved from this research are to find out the responses of Indonesian and Thailand students about ethnomathematics learning and to find out the opinions of Indonesian and Thailand students regarding how to achieve efficient ethnomathematics learning.

METHODS

Research Design, Site and Access, Sampling, and Participants

The research design employed in this study is descriptive qualitative. Qualitative descriptive research aims to offer a comprehensive summary of events encountered by individuals or groups in everyday language (Lambert & Lambert, 2013). Consequently, the focus of this study is on understanding students' reactions to ethnomathematical challenges within the educational context of Indonesian and Thai cultures. The choice of a descriptive qualitative approach is grounded in its ability to delve deeply into a phenomenon by collecting highly detailed data, thereby showcasing the importance of data depth and specificity. This article documents how students engage with mathematics within the cultural frameworks of Indonesia and Thailand.

This study comprised a sample of 50 middle and high school students from Indonesia and Thailand, spanning grades 7 to 12. The rationale behind selecting a diverse group with varying grade levels was to capture a comprehensive perspective on ethnomathematical understanding and its potential variations across different educational stages. By including students from these specific grade levels, the study aimed to explore potential developmental differences in students' responses to geometric material embedded in Indonesian and Thailand cultural contexts. To safeguard the rights of the participants, pseudonyms were employed to conceal the identities of individuals, places, and research sites, as recommended by previous studies (Habibi et al., 2018; Mukminin et al., 2017). The focus of the study material was on geometric concepts intertwined with aspects of Indonesian and Thailand cultures, specifically the two-dimensional shape and the concept of line and function.

Data Collection

Questionnaires are given to students online via Google Form to obtain data regarding students' responses to mathematical concepts in Indonesian and Thailand cultures. This questionnaire consists of 10 questions specially designed to assess students' opinio Online questionnaires distributed via Google Form were utilized to collect data on students' responses to mathematical concepts within Indonesian and Thailand cultures. This questionnaire, comprising 10 purposefully designed questions, sought to evaluate students' opinions. It was exclusively developed for this study and underwent expert validation by two mathematics education lecturers to ensure its relevance and effectiveness. The questionnaire's focus on indicators aligned with students' perspectives was tailored to the expertise of the validating lecturers. All participating students were recipients of this questionnaire, emphasizing its comprehensive reach within the study context. This questionnaire was given to all students involved.

In this study, description test questions were employed to gather data on the exploration and portrayal of ethnomathematics concepts in Indonesian and Thailand cultures. The examination of students' responses aimed to assess their proficiency and understanding of ethnomathematical ideas within the Indonesian societal context. The test, specifically created for this study, underwent expert

validation to ensure its relevance and effectiveness. It was administered directly to four student representatives, selected as a sample group. The uniform test structure facilitated a comparative analysis of students' comprehension across the Indonesian and Thailand cultural contexts. The selection of these four students considered factors such as academic performance and engagement with ethnomathematics to ensure representative insights.

Interviews were conducted on four students who have represented the other students. The selection of students was carried out randomly in each aspect and aimed to find out how students' opinions on ethnomathematical problems in Indonesia and Thailand culture were given and the reasons students chose these responses. Interviews were conducted once after the data analysis was completed. The type of interview used is an unstructured interview.

Data Analysis and Representation

The qualitative descriptive data analysis technique employed in this study involved the following stages:

Data Reduction

Lester et al. (2020) outline the first phase of their qualitative data analysis as data reduction, defining it as the systematic process of selecting, focusing, simplifying, abstracting, and transforming data from written field notes or transcriptions. This initial phase lays the groundwork for a more streamlined and refined dataset, setting the stage for in-depth exploration in the subsequent stages of their analysis. This form of analysis involves refining, categorizing, directing, discarding unnecessary data, and organizing information to draw and confirm conclusions. The process includes selecting, focusing, simplifying, and abstracting raw data from field notes. In the context of this study, the stages of data reduction are outlined as follows: 1) Examining and correcting student work results to extract information about their abilities in solving practical mathematics problems, 2) Transforming the outcomes of student work into notes to serve as interview material, and 3) Condensing the interview results into a coherent and organized paragraph format, which is then translated into notes.

Data Display

In the qualitative data analysis paradigm, the second level, data display, surpasses data reduction, involving the creation of an organized and condensed presentation of information that facilitates drawing conclusions (Lester et al. (2020). This stage entails systematically arranging information in a way that facilitates drawing conclusions and acting. During data display, student work, which serves as the data in this study, is organized in alignment with the research objectives.

Conclusion Drawing and Verification

Drawing conclusions involves taking a step back to comprehend the implications of the analyzed facts and their relevance to the research questions. Verification, closely linked to conclusion drawing, requires returning to the data as many times as necessary to cross-check or confirm these emerging conclusions. Lester et al. (2020) described that the interpretations emerging from the data need scrutiny for plausibility, resilience, and confirmability, indicative of their overall validity. Verification serves as a conclusive action that aids in addressing research questions and objectives. In this study, conclusions regarding the location and causes of student errors in solving realistic problems are reached by comparing the outcomes of student work with the findings from interviews.

Ethical Consideration and Trustworthiness

Before starting the research, the first meeting was held with students and teachers to explain the aims and objectives of the research to be carried out. We also explain how the research will be carried out later and what the role of the school in this research will be. The research team asked the principal for permission to be allowed to conduct research involving many students and teachers. In addition to checking with each participant, researchers also checked with the colleagues who oversaw member checks. Researchers specifically sent all interview transcripts back to the participants to ask their comments on whether they agreed with our data, conclusions, and interpretations.

In this study, students act as research subjects who work on the given instrument and become the object of the interviews conducted. There is no pressure for students to take part in this research. Research activities are carried out on ineffective days so that they do not interfere with the course of teaching and learning activities in schools. The instruments were given evenly, and the process was supervised by researchers and teachers. The identity of the research subject was disguised by using a sequence number (Student 1, Student 2, and so on).

The confirmation of findings' validity occurs as the current data is analyzed to address the research questions. To assess the validity (credibility) of the findings, an examination approach is essential. In this study, validity was investigated using triangulation approaches. Specifically, source triangulation was employed, which involves comparing and cross verifying the reliability of information gathered at different times and through various tools in qualitative approaches. The source triangulation phase in this study entailed comparing the outcomes of student work with the results obtained from interviews. This method enhances the credibility and robustness of the findings by corroborating information from different sources and methods.

RESULTS AND DISCUSSION

Derived from a total of 50 respondents, comprising 30 students from Indonesia and 20 from Thailand, the results indicate that 24 Indonesian students, representing 80% of the Indonesian cohort, displayed a highly positive response to ethnomathematics. In contrast, 14 Thailand students, constituting 70% of the Thailand cohort, exhibited a similarly favorable outlook. Consequently, overall, 76% of the total respondents, specifically 38 students, expressed a very positive response to ethnomathematics. Remarkably, none of the students, whether Indonesian or Thai, provided a negative response to ethnomathematics within the context of their respective cultures.

Through the conducted interviews, it was observed that students from both Indonesia and Thailand exhibited a keen interest in the presented ethnomathematical questions. The interview took place concurrently with two Indonesian students and two Thailand students using a Zoom meeting. The students generally perceived these questions as both challenging and intriguing to engage in. Here are excerpts from interviews with representative students. (Note: T= Teacher, S=Student)

T : After answering three ethnomathematical questions, what do you think about these questions?

S1 : Honestly, this is the first time I have received this type of math problem, sir.

T : Do you think this question is difficult?

S2 : It is not that difficult, sir, but I must understand Indonesian cultural concepts first. I was surprised because there are mathematical concepts in Indonesian culture that I often see.

T : Are you interested in working on questions like this again in the future? Why?

S4 : I am interested, sir, because I find this question challenging. Not too difficult, but I must think deeper to solve it, like answering a riddle.

T : Okay, so do you think this question is suitable for teaching mathematics at school?

S3 : I agree, sir. It seems that this question is good for refreshing our minds from difficult questions that have many formulas.

S2 : That's right, sir. We can also get to know Indonesian culture more deeply through questions like these.

S1 : I think it's an interesting way to learn, sir. It makes me think about math in a different way, considering culture.

It is noteworthy that Students 1 and 2 from Indonesia expressed interest in the challenging nature of ethnomathematical questions, while Students 3 and 4 from Thailand, highlighted the importance of understanding Indonesian cultural concepts and emphasized the suitability of such questions for refreshing the mind from formula-heavy problems. This intersection of perspectives suggests a shared appreciation for the cultural and cognitive aspects embedded in ethnomathematics across both student groups.

The findings from the interviews indicate that students exhibit a keen interest in ethnomathematical questions related to Indonesian culture. This interest stems from the belief among students that questions about their own culture create a pleasant and familiar impression. Moreover, students express the view that responding to ethnomathematics questions contributes to a better understanding of their own culture. The positive response of students to ethnomathematics aligns with the notion that incorporating context and engagement in the learning process makes it easier for students to grasp lessons and increases the likelihood of applying acquired knowledge in their daily lives (Meaney & Lange, 2012; Snounu, 2019).

Furthermore, this educational approach not only equips students with knowledge but also better prepares them to thrive in communities that value cultural dignity (Peni, 2019). It fosters critical reflexivity toward social justice and enhances their understanding of roles and responsibilities in the exercise of citizenship (D'Ambrosio, 2018). As a result, students, through their education, are positioned to contribute meaningfully to societies that uphold cultural integrity and promote social awareness and responsibility.

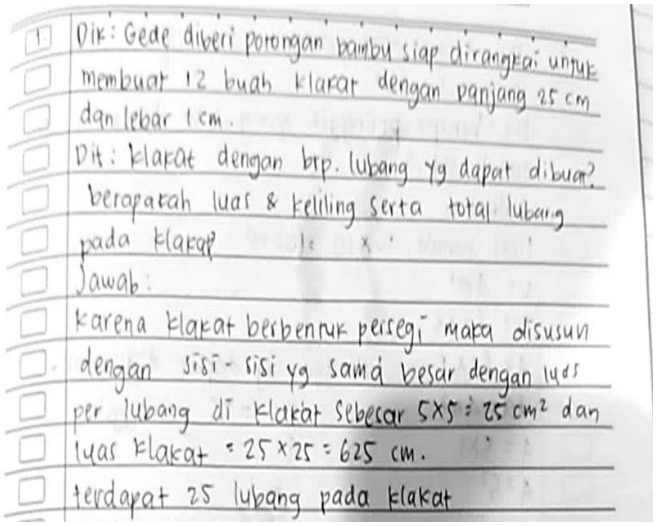
Students perceive ethnomathematics as highly suitable for application in their learning process, recognizing numerous benefits from studying this approach. They believe that ethnomathematics is crucial in education due to its focus on students' shared experiences, which, as noted by Cimen (2014), can significantly aid the learning process. Through the cultural-based sharing of experiences, students gain a more realistic understanding of mathematics and grasp the mathematical concepts embedded in their culture.

However, despite the students' enthusiasm for ethnomathematics, their ability to solve ethnomathematical difficulties is not commensurate. Most students encounter challenges in solving ethnomathematical questions related to Indonesian culture. Many struggle to comprehend the provided ethnomathematical problems and face difficulty relating real-world cultural situations to mathematical principles. This indicates a potential gap between students' positive attitudes towards ethnomathematics and their practical application of mathematical concepts within a cultural context. The author makes this claim by stating that despite the students' enthusiastic reaction, there is a noticeable misalignment with their ability to solve ethnomathematical difficulties. The assertion is supported by the observation that most pupils struggle with solving such questions within the given Indonesian cultural context. The author further emphasizes the students' challenges in understanding ethnomathematical problems and applying mathematical principles to real-world cultural situations. The mention of specific examples of student responses provides concrete evidence to support this claim.

Students frequently fail to understand the problem when answering it, resulting in calculation errors. Students are also unable to extract information from the problem given.

The problem given is: *"Gede is preparing a Klakat for an upcoming religious ceremony, and he has been provided with 12 pieces of bamboo for assembly. Each bamboo piece has dimensions of 25 cm in length and 1 cm in width. It seems like you have mentioned Gede's task related to determining the*

number of holes in the Klakat design, calculating the area and perimeter of the entire Klakat, and finding the total area of the holes within the Klakat. If you have specific instances of student responses that you would like me to review, analyze, or discuss, please provide the details or examples, and I will be happy to assist you further".



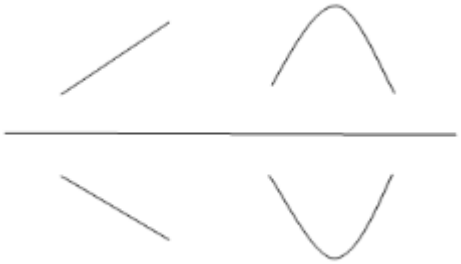
Translated to English:
Knowing:
Gede was given bamboo sticks that are ready to assemble to make 12 Klakat with a length of 25 cm and a width of 1 cm.
Question:
Klakat with how many holes can be made?
What is the area and perimeter of the total holes of the Klakat?
Answer:
Since the Klakat in square shape so it's arranged in the same side with the same size with the area of each hole is 5 x 5 = 25 cm^2 and the area of Klakat is 25 x 25 = 625 cm. There are 25 holes on the Klakat.

Figure 1. Example of student's answer in the problem

Based on the information provided about Figure 1, it appears that the student did not fully grasp the material presented in the questions. The student correctly identified the size of the bamboo sticks as 25 cm x 1 cm, but there seems to be a misunderstanding regarding the number of bamboo sticks (12 pieces) and their association with the construction of the Klakat. The student also mentioned a hole size of 5 x 5 cm from the Klakat without providing an explanation for this choice. This suggests that while the learner understood the overall aim of the question, there was a lack of clarity in comprehending the specific details presented. In summary, the student demonstrated a partial understanding of the given information, correctly identifying certain aspects but misconstruing others, particularly regarding the number of bamboo sticks and the rationale behind the chosen hole size.

In Thailand culture, ethnomathematics is contained in the Thailand language. Thai is a tonal language. If the tone is different for the same word, then the meaning will be different. This finding is reinforced by the results of interviews that say words in Thailand must be careful. This is because, if there is a tone error when pronouncing a word in Thailand, the meaning will not match what is meant. Of course, this will disrupt the communication process. Table 1 below shows the mathematical concepts in the Thailand tonal language.

Table 1. Mathematical concepts contained in thailand tonal language

Analyzed Tone Forms	Contained Mathematical Concepts
	The concept of simple open lines and curves The concept of constant, linear, and quadratic functions The concept of gradient The concept of symmetry The concept of Increasing and Decreasing Functions The concept of the maximum and minimum values of a quadratic function The concept of Concavity The concept of reflection on geometric transformations

The students were tasked with describing the approximate forms of lines or curves that match each musical scale in Thailand. Below are the responses provided by the students.

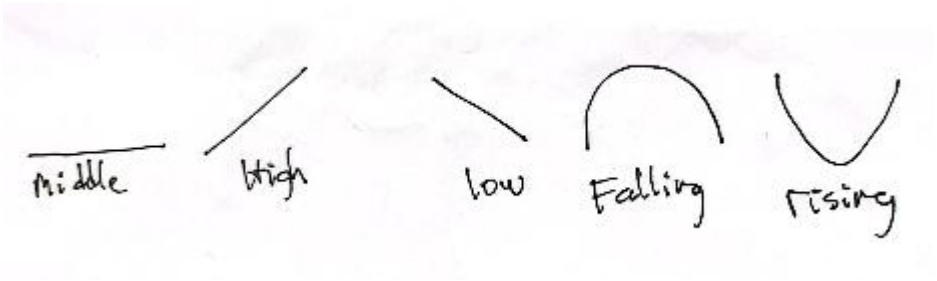


Figure 2. Example of student's answer in the problem

Figure 2 illustrates the representation of tones, considering measurements of frequency (Hz) and time (s) obtained through an analog sound sensor. The depiction of tones in Figure 1 is supported by interview results that echo a similar sentiment. Upon further scrutiny of the portrayal of these five tones in Figure 1, diverse mathematical concepts are identified.

In the exploration conducted by the students, several concepts related to Thai tones were identified. The concept of symmetry is observed in the high tone or sĭang trīi, low tone or sĭang èek, falling tone or sĭang thōo, and rising tone or sĭang càttāwāa. Symmetry in a function is classified into two forms: odd functions and even functions, with specific illustrations provided for each.

An odd function is defined as a function f that satisfies the condition f(-x) = -f(x) for every number x in the domain. Graphically, an odd function is represented by a graph that is symmetrical about the origin, as explained by Stewart (2012). In practical terms, if the graph of the function is created for x > 0, the entire graph for the odd function can be obtained by rotating it by 180 degrees about the origin. Additionally, an odd function is associated with a high tone or sĭang trīi and a low tone or sĭang èek, with the stipulation that the image is attached to the axis or origin.

Students' responses to this concept of ethnomathematics was very interesting. They do not even believe at first that the language they frequently speak contains mathematical concepts in its tone. Students begin to realize that mathematics is universal and exists in various sciences and cultures. They

think learning mathematics through their culture makes them closer to the culture and deepens the mathematical concepts they have. The presented results are derived from a combination of sources, primarily obtained through interviews with students who were exposed to the ethnomathematics concept. During these interviews, students expressed their perspectives and reflections on the ethnomathematics learning experience. The insights were gathered through open-ended questions that allowed students to articulate their thoughts, feelings, and beliefs regarding the concept.

The enthusiastic responses from these students suggest that the concept of ethnomathematics in Balinese culture is well-received. Ethnomathematics not only piques student interest but also provides a challenging avenue for enhancing their mathematical abilities. Students view ethnomathematics as an enjoyable and engaging approach to learning and problem-solving. According to Wulantina & Maskar (2019), teaching mathematics with ethnomathematics-based materials can foster interest, increase motivation, and contribute to student satisfaction and happiness in learning mathematics.

Additionally, Khairida (2019) found that an ethnomathematics-based learning approach significantly boosts students' enthusiasm and cognitive features. This approach provides opportunities for students to recognize and comprehend mathematical concepts within the context of their culture. Teachers also believe that the ethnomathematical method helps improve students' self-concept and higher order thinking skills, making subjects more accessible (Fouze & Amit, 2018). Overall, the integration of ethnomathematics into learning experiences appears to have positive effects on student engagement, motivation, and cognitive development.

From the results of tests and interview conducted, it was found that students were less able to understand realistic mathematical problems, including ethnomathematics. Students know their own culture and are familiar with traditional ceremonial facilities and buildings presented in the questions. However, students stated that in their daily life they pay less attention to these cultural aspects. In addition, students also conveyed that the mathematics learned so far did not lead to understanding concepts and solving real problems. Students tend to learn procedurally so that mathematical concepts become less related to real-world conditions and the surrounding environment. According to Simon (1995), students who primarily focus on learning through the application of mathematical formulas and procedures may face challenges in conceptual understanding and may not perform well in examinations. Additionally, Dündar & Gündüz (2017) argue that learning or teaching mathematics, especially geometry, without establishing connections to daily life can lead to difficulties in comprehending the subject matter. In essence, both perspectives emphasize the importance of integrating conceptual understanding and real-world applications in the learning and teaching of mathematics to enhance comprehension and performance.

Based on the presented results of the students' answers, it is evident that the students struggle to grasp the concept of ethnomathematics. They encounter difficulties in extracting ideas from the given problems, leading to inaccuracies in devising solution plans and ultimately obtaining incorrect results. This aligns with the findings of Payadnya et al. (2021), who observed that students often lack the ability

to comprehend their surrounding environment, including realistic concepts embedded in their own culture. This deficiency in understanding hinders students from correctly interpreting ethnomathematical problems. Therefore, addressing the gap in students' awareness and understanding of cultural contexts is crucial for improving their proficiency in solving ethnomathematical problems. Furthermore, Cahirati et al (2020) that the difficulty in understanding realistic problems experienced by students is characterized by the inability to distinguish the magnitude of the variable based on the instructions in the problem and difficulty understanding the questions given by incorrectly making an example of the existing problems.

Ethnomathematics-based learning holds the potential to enhance students' understanding of both mathematics and their environment. A realistic understanding of mathematics is crucial for cultivating students' thinking skills and problem-solving abilities. Engaging with mathematics realistically enables students to develop essential life skills, including discipline and collaboration, such as patience, responsibility, cooperation, and understanding (Acharya et al., 2022).

Through ethnomathematics, students not only gain insight into the conditions of their environment but also harness their mathematical abilities to address various problems that arise in their surroundings. Understanding the reality of the world requires students to engage in processes of classification and categorization, shaped by cultural and social interactions, enabling individuals to distinguish themselves from others (Adjei, 2019). This socio-cultural perspective suggests that students, when grounded in their cultural context, are more likely to contribute meaningfully to their environment, emphasizing the idea that mathematics learning is enhanced when rooted in cultural considerations.

CONCLUSION

This research has revealed a positive reception among students towards the concepts and problems of ethnomathematics within the cultural contexts of Indonesia and Thailand. From a pool of 50 respondents, including 30 Indonesian and 20 Thailan students, the survey on ethnomathematics revealed that 80% of Indonesian students and 70% of Thailand students showed highly positive responses. Overall, 76% of respondents (38 students) expressed a very positive outlook, with no negative responses from either Indonesian or Thailand students, indicating widespread acceptance of ethnomathematics in both cultures. During the interviews, students expressed a genuine interest and found ethnomathematics to be intellectually challenging. However, despite the positive responses, a significant limitation surfaced—most students struggled to fully comprehend the ethnomathematical concepts and problems within the cultural frameworks of Indonesia and Thailand.

One notable challenge identified is that students faced difficulty generating ideas from the given problems, leading to inaccuracies in formulating solution plans and, consequently, arriving at incorrect

results. This struggle may be attributed to students' insufficient awareness and appreciation of their own culture, coupled with a procedural approach to learning that hinders a deeper understanding.

A recommendation for future research is to explore strategies that enhance students' cultural awareness and engagement with ethnomathematical concepts. This may involve developing innovative teaching methods that bridge the gap between mathematical principles and real-world cultural applications. Additionally, investigating the impact of incorporating ethnomathematics into a broader curriculum could provide valuable insights into its long-term effectiveness in fostering cultural understanding and mathematical proficiency among students. In summary, future research endeavors could focus on refining instructional approaches to address the identified limitations and further promote the integration of ethnomathematics within diverse educational settings.

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