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Bridging Culture and Curriculum: Ethnomathematics in the Educational Landscape of Lampung

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Abstrak

Penelitian ini mengeksplorasi keterkaitan antara prinsip-prinsip matematika dan ekspresi budaya tradisional di Lampung, Indonesia, melalui pendekatan etnomatematika. Fokus penelitian ini tertuju pada artefak budaya yang bernilai tinggi, seperti kain tapis (tenun tradisional), rumah panggung, motif khas marga, tata ruang upacara adat, serta simbol ikonik seperti Siger. Hasil penelitian mengungkapkan bahwa konsep-konsep matematika seperti transformasi geometri, simetri, tesselasi, pengukuran, dan proporsionalitas secara mendalam tertanam dalam bentuk-bentuk budaya tersebut. Melalui pendekatan kualitatif etnografis yang melibatkan wawancara, observasi partisipatif, dan analisis artefak budaya, penelitian ini menangkap wawasan dari para praktisi dan pendidik lokal. Temuan penelitian menyoroti nilai edukatif dari pengintegrasian sistem pengetahuan lokal ke dalam pembelajaran matematika formal, sejalan dengan tujuan pendidikan nasional Indonesia dalam pengembangan karakter dan relevansi kontekstual. Dengan menghubungkan pengajaran matematika dengan warisan budaya lokal, penelitian ini memperkuat konsep pedagogi yang responsif terhadap budaya. Hal ini menekankan potensi peningkatan keterlibatan siswa, penguatan identitas budaya, dan pelestarian pengetahuan tradisional dalam konteks pendidikan kontemporer.

Kata kunci: Warisan budaya dalam pendidikan; integrasi kurikulum; etnomatematika; budaya Lampung; matematika

Abstract

This study explores the intersection between mathematical principles and traditional cultural expressions in Lampung, Indonesia, through the lens of ethnomathematics. It focuses on culturally significant artifacts such as kain tapis (woven textiles), rumah panggung (stilted wooden houses), clan-specific motifs, ceremonial spatial arrangements, and iconic symbols like the Siger. The research reveals that mathematical ideas, including geometric transformation, symmetry, tessellation, measurement, and proportionality, are deeply embedded in these cultural forms. Through a qualitative ethnographic approach involving interviews, participant observation, and cultural artifact analysis, the study captures insights from local practitioners and educators. The findings highlight the educational value of incorporating indigenous knowledge systems into formal mathematics learning, supporting Indonesia's broader educational goals of character development and contextual relevance. By linking mathematical instruction with local heritage, the study advances the concept of culturally responsive pedagogy. It emphasizes the potential to enhance student engagement, strengthen cultural identity, and preserve traditional knowledge within contemporary educational settings.)

Keywords: *Cultural heritage in education; curriculum integration; ethnomathematics; Lampung culture; mathematics*

Introduction

Indonesia is a culturally and geographically diverse archipelago, home to hundreds of ethnic groups, each with unique languages, traditions, and systems of knowledge. Among these, the culture of Lampung stands out for its rich symbolic systems, spatial organization, artisanal crafts, and ceremonial practices (Habsary et al., 2024; Majid & Dina, 2023). Despite the depth and significance of this cultural heritage, traditional knowledge systems in regions such as Lampung remain largely underutilized in formal education, particularly in the field of mathematics(Rosa & Orey, 2011). This disconnection presents both a challenge and an opportunity for educators and researchers seeking to contextualize mathematics instruction and enhance its cultural relevance.

In formal educational settings, mathematics is often perceived by students as abstract, rigid, and disconnected from their everyday experiences. According to Barton (2008), the predominance of algorithmic instruction, which prioritizes procedural fluency over conceptual understanding, has contributed to students' disengagement and difficulty in applying mathematical concepts. These issues are reflected in Indonesia's persistent underperformance in international assessments such as the Programme for International Student Assessment (PISA), where Indonesian students frequently score below the global average in mathematical literacy (OECD, 2019; Stacey, 2011). To address this persistent gap, there is a pressing need for pedagogical approaches that meaningfully connect mathematical content to students' sociocultural environments and lived realities.

Ethnomathematics, a term coined by Brazilian scholar Ubiratan D'Ambrosio (1985), provides a framework for recognizing and validating mathematical thinking that is embedded in cultural practices. It challenges the notion of mathematics as a culture-free, universal discipline by asserting that all societies develop systems of measurement, classification, spatial reasoning, and problem-solving(Cimen, 2014). These systems are often conveyed through non-formal means such as artifacts, rituals, oral traditions, and architectural forms. As noted by Rosa & Orey (2011), ethnomathematics offers powerful pedagogical insights for culturally responsive education and can serve to bridge traditional knowledge with formal academic learning. More recent studies reinforce this view, emphasizing the potential of ethnomathematics to improve mathematical understanding and engagement when integrated into classroom instruction (Ergene et al., 2020; Hamid & Rahmawati, 2024; Hendriyanto et al., 2023; Imswatama & Lukman, 2018; Olga et al., 2024).

In the Indonesian context, numerous studies have demonstrated the presence of mathematical principles in local cultural expressions. For example, Javanese batik incorporates fractal geometry and symmetrical transformations (Burow et al., 2017), Sundanese house architecture reveals practices of proportional reasoning and measurement (Muhtadi et al., 2017), and Balinese temples exhibit sacred geometric layouts that reflect hierarchical spatial reasoning (Arisetyawan et al., 2014). These examples underscore the potential of cultural artifacts as vehicles for conceptual learning and identity reinforcement. However, there is a noticeable lack of equivalent research focused on the ethnomathematical dimensions of Lampung culture, representing a significant gap in both ethnographic and educational literature.

This study seeks to address this gap by exploring mathematical concepts that are embedded in the traditional practices of Lampung society. These include kain tapis (handwoven textiles featuring geometric motifs), rumah panggung (raised wooden houses designed with symmetrical layouts), ceremonial spatial arrangements, clan-based symbolic patterns, and iconic cultural elements such as the Siger crown. Utilizing a qualitative ethnographic methodology that incorporates interviews, participant observation, and cultural documentation, the research investigates how mathematical ideas such as symmetry, tessellation, measurement, transformation, and proportional reasoning are manifested in these cultural elements(Pathuddin et al., 2023; Poerwadi et al., 2023).

The objectives of this study are twofold. First, it aims to uncover and document the mathematical structures inherent in Lampung cultural expressions, thereby contributing to the growing body of knowledge in the field of ethnomathematics. Second, it seeks to develop pedagogical strategies for integrating these findings into school mathematics curricula in alignment with the Indonesian Ministry of Education's emphasis on character development, cultural appreciation, and context-based learning (Nuraini, 2018) The integration of culturally embedded mathematical knowledge is expected to enhance student engagement, deepen understanding, and foster a stronger sense of cultural identity among learners.

By connecting formal mathematics education with indigenous knowledge systems, this study contributes to the broader discourse on inclusive and culturally responsive pedagogy. It affirms that traditional knowledge should not merely be preserved as a cultural legacy but recognized as an intellectual resource that can inform and enrich contemporary educational practices. The findings aim to support teachers, curriculum developers, and policymakers in creating educational models that are deeply rooted in local wisdom while being aligned with global academic standards.

Method

This study employed a qualitative ethnographic design to investigate the mathematical dimensions embedded within Lampung cultural practices. Ethnography was chosen for its capacity to examine cultural meaning systems and to interpret the symbolic, functional, and pedagogical significance of traditional artifacts, rituals, and spatial arrangements, as outlined by (Spradley, 1998). The overarching aim was to document and analyze indigenous mathematical knowledge as expressed through local weaving patterns, architectural forms, ceremonial organization, and symbolic representations in Lampung society.

Participants

Fieldwork was conducted in culturally active communities within West Lampung and Pesawaran Regencies. These regions were selected through purposive sampling due to their strong cultural preservation and accessibility to local artisans and tradition bearers. The participant group comprised traditional weavers, local elders, house builders, ceremonial organizers, and elementary school teachers who demonstrated knowledge of both indigenous culture and pedagogical practice. A total of 22 participants were involved in the study, selected through snowball sampling to ensure the inclusion of key informants deeply involved in the practice, transmission, and preservation of culturally rooted mathematical knowledge. These individuals were recognized within their communities for their active engagement in traditional knowledge systems with mathematical relevance.

Data Collection

Fieldwork was conducted in culturally active communities within West Lampung and Pesawaran Regencies. These regions were selected through purposive sampling due to their strong cultural preservation and accessibility to local artisans and tradition bearers. The participant group comprised traditional weavers, local elders, house builders, ceremonial organizers, and elementary school teachers who demonstrated knowledge of both indigenous culture and pedagogical practice. A total of 22 participants were involved in the study, selected through snowball sampling to ensure the inclusion of key informants deeply involved in the practice, transmission, and preservation of culturally rooted mathematical knowledge. These individuals were recognized within their communities for their active engagement in traditional knowledge systems with mathematical relevance.

Data Analysis

Thematic analysis was employed to identify patterns of mathematical thinking within the cultural practices studied. Guided by the Braun & Clarke's (2006) framework, the analysis followed six iterative stages: familiarization with the data, generation of initial codes, identification of themes, theme refinement, definition of categories, and synthesis of interpretations. The process was informed by conceptual constructs from mathematics education, especially those related to geometry, symmetry, measurement, transformation, and spatial reasoning.

Emerging themes included translational and reflectional symmetry, proportional reasoning, body-based measurement units, tessellation, recursive design patterns, and culturally informed spatial logic. These themes were consistently examined across data sources to ensure coherence and analytical validity. To ensure credibility, the study employed methodological triangulation, drawing on methodological triangulation, integrating observations, interviews, visual documentation, and field notes. Member checking involved presenting preliminary analyses to participants to verify the accuracy of cultural interpretations and receive corrective input.

Transferability was addressed through thick description, offering detailed contextualization that allows readers and researchers to assess the applicability of findings to other cultural and educational contexts. Dependability was supported by maintaining an audit trail of interview transcripts, coding decisions, and analytic memos, allowing for transparency and replication. Confirmability was enhanced through regular peer debriefings with qualitative researchers and mathematics educators not involved in the fieldwork, reducing researcher bias and contributing to analytical integrity, as recommended by Sheldon et al., (1986). Although generalizability is not the objective of qualitative research, the insights generated from this study offer valuable contributions to mathematics education, particularly for developing inclusive and culturally grounded curricula in multicultural contexts.

Findings and Discussion

The findings from ethnographic fieldwork conducted in Lampung reveal that traditional cultural practices contain deeply embedded mathematical structures. The results are organized thematically, each corresponding to a particular cultural artifact or practice. The analysis demonstrates that mathematical ideas such as geometry, measurement, transformation, symmetry, tessellation, and proportionality are not only present but are deeply interwoven into the

social and ceremonial life of the Lampung community. These findings illustrate the pedagogical potential of local wisdom as a culturally responsive context for mathematics education.

To support curricular integration and cross-cultural comparison, the key findings are summarized in Table 1.

Table 1. Ethnomathematical Elements Embedded in Lampung Cultural Practices

Cultural Practice	Mathematical Concepts	Educational Application	Cultural Significance
Kain Tapis	Translational and reflectional symmetry, geometric patterns	Teaching transformations, symmetry, and pattern recognition	Symbol of femininity, balance, and social identity
Rumah Panggung	Ratio, proportion, body-based measurement systems	Introducing proportion, scale, and ethnometric understanding	Architectural expression of spiritual balance and social order
Clan Motifs (Buway Lunik)	Tessellation, geometric transformation	Understanding tessellation and spatial reasoning	Visual representation of lineage and identity
Traditional Games	Spatial orientation, grid logic, numeracy	Developing spatial reasoning and early mathematical concepts	Transmission of numeracy through embodied and playful learning
Siger Crown	Fractal symmetry, recursive patterning	Teaching recursion and self-similarity in visual mathematics	Icon of pride, womanhood, and regional leadership
Ceremonial Layouts	Coordinate geometry, matrix structures, logical sequencing	Teaching positional logic, matrix arrays, and symmetry concepts	Reflection of hierarchy and sacred order in ceremonial spatial design

Source: Fieldwork data and interviews (2025)

Kain Tapis: Geometry and Transformation in Textile Design

Kain tapis, the handwoven textile unique to Lampung, represents more than just a traditional craft; it is a cultural artifact that encapsulates deep mathematical principles through its intricate designs. The weaving of kain tapis involves geometric patterns that have significant cultural meaning, incorporating shapes such as diamonds, zigzags, triangles, and rectangles. These shapes are not random but carry symbolism: diamonds represent femininity, zigzags convey harmony, and triangles and rectangles are associated with cosmological beliefs and the natural world. By incorporating metallic threads, the weavings also reflect the cultural importance of beauty and craftsmanship, elevating these textiles beyond mere functional items to objects of cultural and mathematical significance.

From a mathematical perspective, *kain tapis* serves as a rich source of geometric patterns that illustrate various forms of symmetry. The use of translational symmetry, where a motif repeats in a regular pattern, reflectional symmetry, where patterns mirror themselves along a central axis, and rotational symmetry, where patterns can be rotated around a central point without altering their appearance, are all evident in the textile's design. These principles of symmetry are crucial in understanding geometric transformations, and the patterns in kain tapis provide a practical, real-world application of these concepts (Suherman & Vidákovich, 2022; Susiana et al., 2020). The deliberate symmetry used in the textile's design speaks to both the cultural value placed on balance and harmony, and the advanced understanding of geometry inherent in the weaving process.

As illustrated in Figure 1, these intricate patterns offer a concrete example of how cultural expression can be tied to formal mathematical concepts. The symmetrical motifs in kain tapis not only bring the cultural heritage of Lampung to life but also serve as a bridge for students to explore the mathematical theories of symmetry and transformations. By studying these patterns, students can directly engage with the application of geometric concepts, making the connection between traditional craftsmanship and modern mathematical principles clearer. This provides a unique opportunity to teach mathematics through culturally significant examples, fostering both appreciation for local heritage and understanding of abstract mathematical ideas.

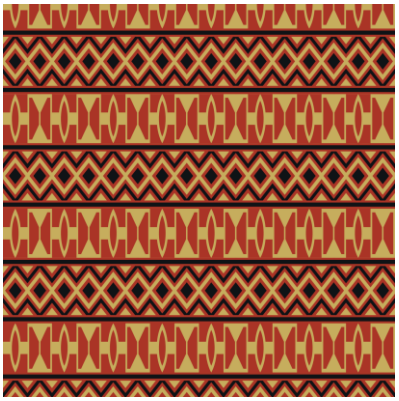

Figure 1. Translational and Reflectional Symmetry in a Tapis Motif

Integrating the geometric patterns found in kain tapis into school mathematics curricula offers a unique and impactful opportunity to significantly enhance students' conceptual understanding. By examining these intricate cultural patterns, students can actively explore fundamental mathematical principles, such as symmetry, transformation, and spatial reasoning, within a tangible and real-world context. This approach not only strengthens mathematical learning by making abstract concepts concrete but also profoundly affirms students' cultural identity, fostering a deeper and more meaningful connection between their rich heritage and formal education.

This finding is highly consistent with and builds upon a growing body of ethnomathematical research that advocates for the use of cultural artifacts in mathematics education. For instance, the use of Tapis patterns for exploring mathematical concepts aligns directly with the findings of Susiana et al. (2020) and Suherman and Vidákovich (2022), both of whom explicitly investigated the mathematical concepts embedded within Tapis Lampung. Furthermore, this pedagogical strategy aligns with broader studies that demonstrate the effectiveness of culturally grounded approaches, such as the exploration of Javanese cultural practices by Burow et al. (2017) and the examination of traditional architectural designs for geometric understanding (Fauzi & Gazali, 2022; Mairing et al., 2024). The integration of kain tapis exemplifies D'Ambrosio's (1985) and Rosa and Orey's (2011) vision of ethnomathematics, where mathematics is understood as a cultural construct. By effectively bridging traditional craftsmanship with mathematical concepts, this method makes learning inherently more engaging and relevant, transcending rote memorization. Ultimately, this integration helps students genuinely appreciate the pervasive intersection of culture and mathematics in everyday life, leading to more profound mathematical literacy and a stronger sense of cultural pride —a crucial contribution to equitable and effective mathematics education.

Rumah Panggung: Proportion and Ethnometric Measurement in Architecture

Rumah panggung, the traditional stilted wooden houses of Lampung, are iconic structures that embody both aesthetic and functional values within the local culture. These houses are designed with precise symmetrical layouts and proportional dimensions, showcasing an inherent balance between form and function. The central entrance serves as the focal point, with rooms and spaces symmetrically arranged on either side, reflecting a deep understanding of spatial harmony. This careful arrangement not only serves practical needs but also symbolizes cultural values such as unity, balance, and respect for nature, fundamental aspects of Lampung's architectural tradition. The use of these principles ensures that the house remains stable, functional, and aesthetically pleasing, fostering a sense of well-being for its inhabitants.

The design of *rumah panggung* relies heavily on ethnometric units that have been passed down through generations. These units, such as *depa* (arm span), *hasta* (elbow to fingertip), and *jengkal* (hand span), provide a direct and accessible way for builders to measure and maintain proportionality in the construction process. These body-based measurements, rooted in daily human experience, offer an intuitive method for determining spatial relationships within the house. The use of these units is not exclusive to Lampung but is also prevalent in other traditional Indonesian architectures, such as the Sasak houses in Lombok (Fauzi & Gazali, 2022), the Gayo Umah Kantur in Aceh (Jannah et al., 2024), and the Betang Damang Batu in Central Kalimantan (Mairing et al., 2024). These cross-regional similarities illustrate a shared cultural approach to proportion and spatial logic, underscoring the cultural significance of measurement and geometry in Indonesian heritage.

In educational contexts, the design of rumah panggung offers rich opportunities to teach mathematical concepts, especially related to geometry and spatial reasoning. The inherent symmetrical layout and proportional dimensions provide concrete examples of mathematical principles such as ratio, scale, and symmetry, which are foundational to geometry. This observation aligns strongly with previous ethnomathematical research, which highlights the mathematical embeddedness in traditional architecture. For instance, studies on the traditional residence of the Sasak tribe by Fauzi and Gazali (2022) and the exploration of Dayak Ngaju housing by Mairing et al. (2024) similarly demonstrate how indigenous architectural practices embody complex geometric and proportional principles. Furthermore, the practical application of these mathematical concepts, visibly observed in the design of rumah panggung, resonates with the broader argument by Rosa

and Orey (2011) that mathematics is not solely an abstract discipline but is deeply rooted in cultural practices.

Teachers can effectively leverage these examples to demonstrate how proportions are maintained in real-world structures, helping students visualize abstract concepts through tangible, culturally significant architecture. This approach not only strengthens mathematical learning by making it more relevant and accessible but also affirms students' cultural identity, fostering a deeper appreciation of both mathematics and their heritage. Ultimately, integrating the mathematics of rumah panggung into the curriculum serves as a powerful illustration of the intersection of culture and mathematics, contributing to a more engaging and contextually rich learning environment that can enhance mathematical literacy and cultural understanding.

As seen in Figure 2**,** the symmetrical layout and proportional dimensions of the *rumah panggung* serve as a vivid representation of how mathematics can be applied to real-life situations. This visual aid illustrates the mathematical relationships between different sections of the house, allowing students to grasp the relevance of ratio and proportion in architectural design. Such teaching methods not only enhance students' understanding of mathematical concepts but also encourage them to appreciate the cultural heritage embedded in these designs. By connecting mathematical theory to real-world applications, educators can foster a more comprehensive understanding of both math and architecture, bridging the gap between academic knowledge and cultural traditions.

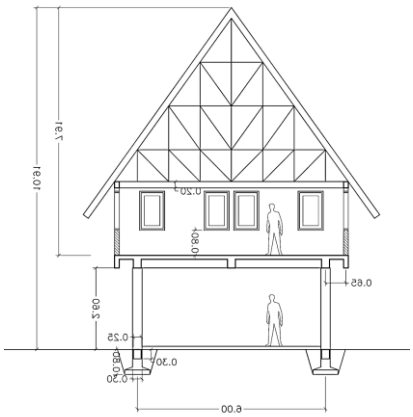

Figure 2. Symmetrical Floor Plan and Proportions in Rumah Panggung Architecture

Motif Buway Lunik: Clan Identity and Tessellation

The Buway Lunik clan system, a fundamental aspect of Lampung's cultural heritage, employs distinctive motifs in its textiles and carvings that are far more than mere decoration. These

designs are deeply symbolic, with each one corresponding to a specific clan, thereby embodying intricate family and social structures. The motifs frequently appear in tessellated patterns, seamlessly repeating across surfaces and forming intricate designs using fundamental geometric shapes such as triangles, hexagons, and parallelograms. The precise tiling of these shapes without gaps or overlaps is a striking example of mathematical precision and visual harmony, directly reflecting the cultural importance of balance and order within the clan system.

This observation is highly consistent with and extends existing ethnomathematical research that highlights the pervasive presence of geometric principles in traditional cultural artifacts and social structures. For instance, the tessellated patterns found in Buway Lunik motifs align directly with studies on the geometric concepts embedded in various cultural textiles, such as the Tapis patterns explored by Susiana et al. (2020) and Suherman and Vidákovich (2022). Furthermore, the symbolic representation of social structures through mathematical patterns resonates with the broader understanding of ethnomathematics, as articulated by D'Ambrosio (1985) and Rosa and Orey (2011), where cultural practices serve as a rich source for mathematical inquiry. The precise arrangement of these shapes to represent familial and social order also echoes the structured mathematical thinking found in ceremonial planning, as discussed in other sections of this study. This research highlights that the decorative motifs of the Buway Lunik clan system provide a compelling, culturally grounded resource for teaching geometry, patterns, and spatial reasoning in mathematics education. By integrating these examples, educators can foster a deeper appreciation for the intrinsic connection between cultural heritage and mathematical thought, making abstract concepts more accessible and relevant to students' lived experiences.

From a mathematical standpoint, the tessellation of these shapes demonstrates key principles of geometric transformation, such as translation, reflection, and rotation. In tessellation, translation refers to the repetition of a shape by sliding it across the surface, reflection involves creating mirror-image patterns, and rotation refers to rotating a shape around a central point. These mathematical principles are embedded in the very structure of the Buway Lunik clan designs, making them ideal for illustrating the concept of geometric transformations. The repetition and symmetry of these patterns also align with mathematical ideas of periodicity and invariance, showing how the same shapes can be rearranged while maintaining a cohesive design.

These motifs are ideal for teaching tessellation and geometric transformation in schools, providing a concrete example of how mathematics can be applied to cultural and artistic traditions (Pintus et al., 2014). By exploring these designs, students can see how the abstract logic of

mathematics is connected to tangible, real-world objects. These patterns offer an opportunity to engage with geometry not just as a theoretical subject, but as something that reflects the social, cultural, and familial values of the Lampung people. By integrating cultural elements like the Buway Lunik clan system into mathematics lessons, educators can enrich students' understanding of geometry, demonstrating that math is not just about numbers, but also about the world around them and the people who shape it.

Traditional Games and Numeracy Systems

Traditional Lampung games, such as engklek (a regional variant of hopscotch) and gasing (spinning tops), demonstrate the integration of spatial awareness and informal mathematical concepts. Engklek, with its grid-based layouts and sequential movement, implicitly fosters an understanding of symmetry and sequential thinking. These findings align with broader ethnomathematical research, which highlights the mathematical underpinnings of traditional games across various cultures, such as the practices of the Baduy culture (Arisetyawan et al., 2014) and Javanese cultural explorations (Burow et al., 2017). Furthermore, the dynamic nature of gasing, involving principles of motion, direction, and balance, reinforces the practical application of geometry and physics, echoing the real-world mathematical contexts found in studies by Ergene et al. (2020) on ethnomathematics activities.

Beyond games, indigenous numeracy is vividly evident in traditional Lampung counting terms, such as sai (one), dua (two), telu (three), apat (four), and lima (five). While standard Indonesian numbers are gradually supplanting these terms, their existence underscores a rich linguistic and numerical heritage. This observation is consistent with the perspective of D'Ambrosio (1985) and Rosa and Orey (2011), who emphasize the cultural embeddedness of mathematics and the importance of recognizing diverse numerical systems. Incorporating these traditional games and counting systems into early childhood education offers a powerful pedagogical approach, supporting holistic learning that seamlessly integrates movement, language, and numerical reasoning (Saida, . A. et. al.,2021; Kurniasih, N.,et. al.,2021; Sulistyorini, E. et. al. ,2021). This integration not only enriches mathematical understanding by grounding it in familiar cultural contexts but also contributes to the preservation of indigenous knowledge and enhances students' engagement and meaningful learning, as suggested by Olga et al. (2024) in the context of mountainous Papua.

Siger Symbol: Recursive Symmetry and Fractal Aesthetics

The Siger, a prominent ceremonial headdress worn by Lampung brides and featured in regional symbols, presents a compelling example of advanced mathematical concepts embedded within cultural artifacts. Its design, characterized by multiple symmetrical peaks evoking mountain ranges and exhibiting recursive elements where the overall structure is built from repeating smaller components, offers a rich context for ethnomathematical exploration. While fractal geometry is often reserved for advanced study, Sierpinski's inherent self-similarity provides an accessible and culturally meaningful platform to introduce complex mathematical ideas, such as recursion and scaling, to learners. This finding resonates strongly with prior ethnomathematical research that identifies mathematical principles in various cultural expressions. For instance, the presence of symmetry and geometric patterns aligns with observations in Javanese culture (Burow et al., 2017) and the symbolic designs found in Tapis Lampung (Susiana et al., 2020; Suherman & Vidákovich, 2022). Furthermore, the recursive nature of Siger's design contributes to the growing body of knowledge on how indigenous knowledge systems implicitly contain sophisticated mathematical structures, similar to the spatial reasoning found in traditional architecture (Fauzi & Gazali, 2022; Mairing et al., 2024) and the pattern-making activities explored in Sundanese ethnomathematics (Muhtadi et al., 2017). This research highlights that the Siger serves as a powerful instructional tool, offering a tangible and culturally relevant entry point for students to grasp abstract mathematical concepts, such as recursion and scale, thereby enriching the mathematics curriculum with authentic, local examples and contributing to a more inclusive and engaging learning experience(Eryanti, I.,et. al,2022; Nada, Q., & Prasetyo Aji, . P., 2022; Maesya, et. al., 2021).

Ceremonial Space and Spatial Logic

The meticulously organized spatial arrangements observed in Lampung ceremonial events, characterized by rectangular mat arrays, bilaterally symmetrical guest seating, and hierarchically oriented sacred objects, reflect an intuitive grasp of fundamental mathematical concepts. These arrangements serve as compelling real-world analogs for matrix structures, Cartesian planes, and positional logic, enriching the learning of formal mathematics with culturally grounded examples. This finding aligns with and further supports prior ethnomathematical research demonstrating mathematical principles embedded in cultural practices, such as the study by Arisetyawan et al. (2014) on Baduy culture, Muhtadi et al. (2017) on Sundanese practices, and Wiryanto et al. (2022) on Javanese traditions. Specifically, the symmetrical seating arrangements

resonate with the geometric explorations found in Javanese ethnomathematics by Burow et al. (2017) and Budi Lestari et. al (2022), while the hierarchical placement of sacred objects echoes the spatial reasoning inherent in traditional architectural studies, such as those by Fauzi and Gazali (2022) on Sasak residences and Mairing et al. (2024) on Dayak Ngaju housing. Moreover, the inherent structure in Lampung ceremonial planning reinforces the broader notion, as articulated by Rosa and Orey (2011), that mathematics is deeply intertwined with cultural contexts. The results of this study underscore the significant value of Lampung cultural practices as rich sources of ethnomathematical knowledge, ideal for integration into school curricula. This integration, encompassing practices like weaving (Suherman & Vidákovich, 2022), architecture, ceremonial planning, and symbolic design (Majid & Dina, 2023), offers profound mathematical meaning that directly aligns with key educational competencies in geometry, measurement, numeracy, and spatial reasoning, thereby fostering more culturally relevant and engaging mathematics education.

To integrate these findings effectively, collaboration among educators, curriculum developers, cultural experts, and local communities is essential. Teacher education programs should include training in culturally responsive pedagogy and provide examples derived from local traditions. Such approaches support national educational goals focused on character development, multicultural understanding, and contextualized learning (Arisetyawan et al., 2014; Nuraini, 2018; Wiryanto et al., 2022).By embedding Lampung ethnomathematics into formal instruction, educators can close the gap between abstract content and real-world experience. This integration validates indigenous knowledge systems as sources of mathematical insight and strengthens student engagement by connecting learning with cultural heritage.

Conclusion

This study has revealed that mathematical concepts are deeply embedded in the traditional cultural practices of Lampung society. Through a qualitative ethnographic approach, it was found that artifacts such as kain tapis, rumah panggung, clan motifs, traditional games, the Siger crown, and ceremonial spatial layouts all exhibit elements of geometry, symmetry, proportion, transformation, tessellation, measurement, and logical structuring. These findings confirm that local wisdom, often passed down through generations in non-formal contexts, contains rich mathematical knowledge that remains largely untapped in conventional education systems (Roslani, & Nuriadin, I., 2022; Yanti, F.,et. al, 2022).

By documenting and analyzing these cultural expressions, the study contributes to the growing field of ethnomathematics and offers a strong case for integrating indigenous knowledge into mathematics education. The inclusion of culturally grounded materials not only supports conceptual understanding but also fosters student engagement, identity affirmation, and respect for cultural heritage. In doing so, mathematics becomes more than a technical discipline; it becomes a medium through which learners can connect with their history, environment, and community.

The educational implications of this research are significant. Ethnomathematical content drawn from Lampung culture aligns well with curricular goals in geometry, numeracy, and spatial reasoning. It also responds to national priorities related to character education, contextual learning, and cultural preservation. For these benefits to be realized, collaboration among educators, curriculum developers, local cultural practitioners, and policymakers is essential. Teacher training programs should be expanded to include culturally responsive pedagogies that equip educators to incorporate local knowledge systems into their instructional practices.

In conclusion, the integration of Lampung ethnomathematics into formal education represents a promising pathway toward inclusive, contextualized, and culturally affirming mathematics instruction. It validates indigenous intellectual traditions as valuable sources of knowledge and provides a model for similar initiatives in other ethnically diverse regions of Indonesia and beyond.

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