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Ethnomathematical Insights from the Geometric Architecture of the Sultan Mahmud Badaruddin II Museum

Dina Octaria[1], Zulkardi[2*], Ratu Ilma Indra Putri[3], Cecil Hiltrimartin[4]

Mathematics Education Department, Sriwijaya University
Jalan Srijaya Negara Bukit Lama, Palembang, South Sumatra, Indonesia
[1]dinaoctaria@univpgri-palembang.ac.id; [2*]zulkardi@unsri.ac.id; [3]ratuilma@unsri.ac.id; [4]cecilhiltrimartin@fkip.unsri.ac.id

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Abstrak
Pembelajaran geometri di sekolah sering kali bersifat abstrak dan kurang memanfaatkan sumber belajar kontekstual yang dekat dengan kehidupan sehari-hari siswa. Padahal, warisan budaya memiliki potensi besar sebagai media pembelajaran matematika yang menghubungkan konsep geometri dengan nilai-nilai lokal. Penelitian ini mengkaji konsep geometri dalam arsitektur Museum Sultan Mahmud Badaruddin II Palembang serta potensinya sebagai sumber belajar etnomatematika. Menggunakan pendekatan kualitatif dengan metode etnografi yang dimodifikasi, penelitian dilakukan melalui lima tahap utama: eksplorasi awal dan identifikasi informan, pengumpulan data lapangan, dokumentasi visual dan kontekstual, analisis data, serta interpretasi etnomatematis. Data dikumpulkan melalui observasi, wawancara semi-terstruktur, dan dokumentasi visual, dianalisis dengan pendekatan domain dan taksonomi, serta diverifikasi melalui traingulasi sumber. Hasil menunjukkan elemen arsitektur museum, memuat konsep bangun datar, bangun ruang, kesebangunan, simetri, dan transformasi geometri yang terintegrasi dengan nilai budaya lokal. Temuan ini merekomendasikan integrasi museum dalam PjBL dan kurikulum berbasis kearifan lokal untuk meningkatkan keterlibatan siswa, identitas budaya, dan kompetensi guru.
Kata Kunci: Arsitektur Museum; Etnomatematika; Geometri; Pendidikan Matematika; Warisan Budaya

Abstract
Geometry learning in schools often remains abstract and makes limited use of contextual resources that are closely connected to students' daily lives. Cultural heritage holds significant potential as a medium for mathematics instruction, linking geometric concepts to local values. This study examines the geometric concepts embedded in the architecture of the Sultan Mahmud Badaruddin II Museum in Palembang and explores its potential as a learning resource within an ethnomathematics framework. Employing a qualitative approach with a modified ethnographic method, the research was conducted in five main stages: initial exploration and informant identification, field data collection, visual and contextual documentation, data analysis, and ethnomathematical interpretation. Data were collected through observations, semi-structured interviews, and visual documentation, analyzed using domain and taxonomic approaches, and verified through source triangulation. The results indicate that the museum's architectural elements contain concepts of plane figures, solid figures, similarity, symmetry, and geometric transformations, all integrated with local cultural values. The study recommends integrating museums into PjBL and local wisdom-based curricula to enhance student engagement, strengthen cultural identity, and improve teachers' competencies.
Keywords: Museum Architecture; Ethnomathematics; Geometry; Mathematics Education; Cultural Heritage

I. INTRODUCTION

Culture represents the tangible manifestation of creativity, values, and knowledge systems that evolve within a society. Continuous interaction between humans and their surroundings shapes cultural heritage (Utari et al., 2021; Prabawati, Mulyani, & Muslim, 2024). Every cultural artifact-whether traditional product, works of art, or architectural designs, reflects a structured way of thinking that often embeds mathematical elements, either intentionally or unintentionally. Mathematics, particularly geometry, is not an isolated discipline; rather, it emerges from human need to understand, represent, and transform the surrounding world. This view aligns with Bishop (1994), who emphasized that mathematics is deeply interwoven with culture and permeates all aspects of human life, regardless of geographic context. Such integration provides a rich foundation for learning, fosters active learner engagement, and reinforces the understanding that mathematical concepts are inherently embedded in cultural practices (Jia & Meng Zhang, 2023).

Ethnomathematics examines the interplay between culture and mathematics (Nova & Putra, 2022; Nursyamsiah et al., 2024). It investigates how mathematical concepts are expressed through cultural practices, such as counting systems, measurement methods, design patterns, architecture forms, and traditional games (D'Ambrosio & Paulo, 2001; Riadi, Turmudi, & Juandi, 2024). Integrating local culture, through ethnomathematics can reshape perceptions of mathematics, demonstrating its relevance in everyday life (D'Ambrósio & Knijnik, 2020; Herawaty & Widada, 2018; Widada et al., 2019). In mathematics education, teachers are therefore encouraged not only to present mathematical concepts in abstract form but also to connect them with students' cultural and daily experiences (Setiana et al., 2021; Kristial et al., 2021; Syafriafdi et al., 2019). Such cultural contextualization makes learning mathematics more meaningful and accessible, particularly for elementary school students who rely heavily on concrete experiences and contextual examples to develop conceptual understanding (Zulkardi, 1999; Afriansyah, 2022).

Palembang, a city in Indonesian rich in cultural heritage, offers abundant potential as a contextual resource for mathematics education. The city's diverse cultural assets include museums (Lisnani et al., 2020; Lisnani et al., 2022), mosques (Lisnani & Gustira, 2023), traditional dances (Rawani et al., 2023; Hartatiana et al., 2023), and the renowned songket woven fabric (Sari et al., 2024; Sanita & Susanti, 2024). From an ethnomathematical perspective, museums are particularly compelling because they preserve tangible artifacts that integrate cultural meaning with mathematical form. Previous studies in Palembang have primarily focused on the Balaputra Dewa Museum, examining plane figures in cultural artifacts (Lisnani et al., 2020) and conducting ethnomathematical analyses of the traditional Limas House (Lisnani et al., 2022). While these works reveal the potential of cultural artifacts to represent mathematical ideas, they remain limited in scope, addressing only selected objects and

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overlooking other culturally significant sites.

One such underexplored site is the Sultan Mahmud Badaruddin II Museum, strategically located along the Musi River near the Ampera Bridge and Kuto Besak Fort. Despite its cultural and historical importance, few studies have examined this museum from an ethnomathematical perspective. Built between 1823 and 1825 on the ruins of the former Kuto Lamo Palace, the building blends European architectural styles with local cultural features. Its symmetrical floor plan (32 \times 22 \times 17 meters) is crowned with a distinctive square-based pyramid roof. Architectural details, such as floor layout, window shapes, building symmetry, and carved ornamentation, incorporate geometric concepts including two-dimensional and three-dimensional shapes, symmetrical patterns, and geometric transformations (Agustin et al., 2024; Sulistiawan et al., 2023).

However, no prior research has systematically identified and analyzed these geometric features or explored their pedagogical potential as contextual resources for mathematics education. In particular, there is a notable gap in studies that connect the geometric characteristics of the Sultan Mahmud Badaruddin II Museum with structured educational framework designed to enhance elementary students' spatial literacy. This gap an underutilization of the museum's cultural-mathematical richness in classroom practice.

This study offers a comprehensive ethnomathematical exploration of the museum's architectural and decorative elements, focusing on their underlying geometric principles. Unlike previous research, which has examined other cultural sites or treated cultural context in a fragmented manner, this study positions the museum as a holistic, authentic learning environment. It aims to provide educators with culturally grounded tools for teaching geometry that strengthen students' spatial reasoning and connect mathematical knowledge to their lived experiences.

Accordingly, the present study seeks to explore the geometric concepts embedded in the architectural elements and ornaments of the Sultan Mahmud Badaruddin II Museum in Palembang, with the goal of utilizing them as a foundation for contextual geometry learning in the region. In doing so, it contributes to the ethnomathematics literature in Indonesia by linking cultural heritage with the development of spatial literacy in elementary education.

II. METHOD

This study, conducted from October 24, 2024 to November 1, 2024, with the aims of investigating geometric concepts embedded in cultural architecture by employing a qualitative methodology supported by an ethnographic approach. Ethnography allows researchers to engage meaningfully with cultural settings and uncover the meanings and practices underlying mathematical thinking as it naturally emerges in real-world contexts. As highlighted in previous studies (Rosa & Orey, 2021; Presmeg, 2020; Knijnik, 2024;

Andersson et al., 2023), this approach is valuable for identifying local mathematical practices that are often underrepresented in conventional curricula. The method used in this study is both empirical and theoretical, designed to describe and analyze mathematical activities and geometric representations as they are expressed within culturally grounded environments. This methodological stance aligns with sociocultural perspectives on mathematics and emphasizes the importance of incorporating ethnomathematical insights into culturally responsive pedagogical practices. The researcher acted as a participant observer, enabling in-depth engagement with the cultural context under investigation.

A modified version of the ethnographic stages by Spradley (1979) was applied, streamlined into five main phases: initial exploration and informant identification, field data collection, visual and contextual documentation, data analysis and triangulation, and ethnomathematical interpretation (Figure 1).

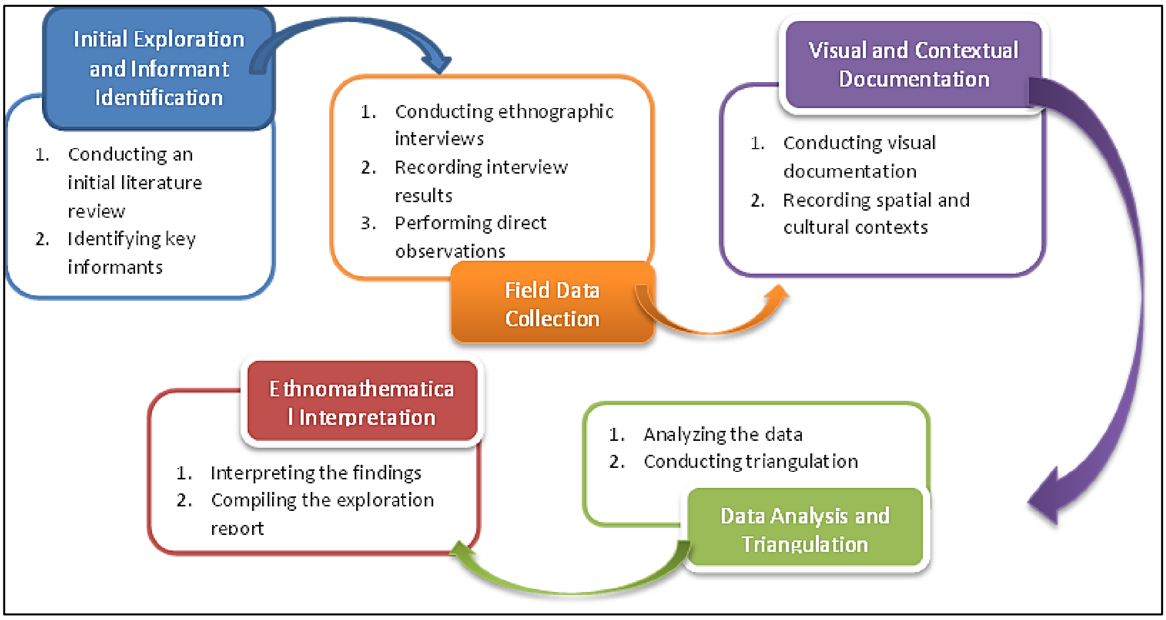

Figure 1. Modified Ethnographic Stages based on Spradley's model (1979)

1. Initial Exploration and Informant Identification

The first stage involved a literature review on the history and architectural characteristics of the Sultan Mahmud Badaruddin II Museum. This review included historical documents, museum archives, and references on local and colonial architecture. At this stage, key informants were also identified using purposive sampling, specifically individuals with extensive knowledge of the cultural aspects and structural features of the museum, such as local historians, architects, and museum administrators.

2. Field Data Collection

The second stage consisted of ethnographic interviews guided by a semi-structured interview protocol. The interview guide covered four thematic areas, including: (1) historical background and cultural significance of the museum's architecture, (2) symbolic meanings embedded in specific architectural elements and ornaments, (3) functional and structural aspects related to geometric forms, (4) perceptions regarding the potential use of these features in mathematics learning. The semi-structured format ensured consistency across interviews while allowing flexibility to explore deeper insights. Data from interviews were supplemented with field notes and reflective journals documenting the narratives and interpretations provided by the informants. Additionally, direct on-site observations were conducted to examine the geometric elements within the museum's structure and spatial arrangement.

3. Visual and Contextual Documentation

The third stage focused on recording and contextualizing visual data. Photographs, video, and sketches of identified geometric forms were collected to capture both structural details and their placement within the cultural and functional context of the building.

4. Data Analysis and Triangulation

In the fourth stage, data were analyzed using domain and taxonomic approaches to classify the geometric forms into specific categories. Source triangulation was employed by comparing and cross-validating information obtained from interviews, field observations, and visual documentation to ensure the consistency, credibility, and confirmability of the findings.

5. Ethnomathematical Interpretation

The fifth stage involved interpreting the identified geometric elements within the framework of mathematical knowledge embedded in local culture. The primary aim of this stage was to identify the potential for integrating these geometric concepts into mathematics education, particularly in ways that support culturally responsive teaching and the development of students' spatial reasoning skills.

III. Result and Discussion

A. Initial Exploration and Informant Identification

The initial exploration identified the Sultan Mahmud Badaruddin II Museum as a site rich in architectural features that incorporate geometric concepts and reflect the cultural values of Palembang. Key informants, selected through purposive sampling, included local historians, museum administrators, and conservation architects. Insights from these initial interviews guided the mapping of primary elements for further observation, such as the floor plan, roof structure, columns, doors, windows, stairs, roof supports, and ornamental details.

B. Field Data Collection

Data collected through semi-structed interviews, participatory observations, and reflective note-taking revealed that the architectural design embodies symbolic meanings rooted in the cultural heritage of Palembang. Two prominent mathematical-cultural concepts identified were symmetry and the square. Symmetry is regarded as a representation of social balance and harmony (Purbadi et al., 2020; Iwuanyanwu et al., 2024). While, the square symbolizes stability and order, serving as the foundation of Palembang's multicultural social fabric (Djumrianti et al., 2024). The recurring square patterns in the building's design serve both as an aesthetic features and as mediums for conveying socio-cultural messages, strengthening visitors' emotional engagement with the local heritage.

Observations of the floor plans revealed that each level of the museum contains nine main rooms arranged in a grid pattern. This spatial arrangement aligns with mathematical concepts of matrices and coordinate systems, while also optimizing visitor circulation and enabling systematic exhibition organization (Mandaka et al., 2023). This regularity mirrors socio-cultural principles of order (Widharetno & Saleh, 2022) and offers potential for integration into geometry learning through real-life contexts.

Additional architectural elements include approximately 30 Doric-style columns per floor, historically associated with order and stability (Vozniak et al., 2020). The doors and windows, many of which feature semi-circular arches, contribute to both visual aesthetics and reinforcement of symmetrical and harmonious design principles. From an ethnomathematical standpoint, these shapes illustrate geometric concepts such as arc length and similarity, while simultaneously reflecting the cultural value of social harmony (Purbadi et al., 2020; Neonbasu et al., 2024; Chitima & Mmakola, 2023).

The museum's exterior staircase comprises 21 concrete steps with a consistent gradient, offering a practical example for introducing the mathematical concept of slope. The spiral staircase-locally known as the rumah keong ("snail house")-symbolizes cycles of life, historical journeys, and the progression of knowledge. This form aligns with the museum's role as both a guardian of history and a center of education, while providing opportunities to explore geometric transformations and recurring mathematical patterns. Overall, these findings demonstrate that architectural elements grounded in local cultural wisdom can serve as effective contexts for teaching formal mathematical concepts. Consistent with the principles of Pendidikan Matematika Realistik Indonesia (PMRI), such integration bridges abstract geometry with students lived experiences, fostering deeper understanding and engagement.

C. Visual and Contextual Documentation

Visual documentation, obtained through photographs, video recordings, and sketches, captured a range of geometric elements embedded in the architectural design of the Sultan Mahmud Badaruddin II Museum.

1. Floor Plan

The museum's spatial organization features a symmetrical layout dominated by rectangular and square forms. A rectangle is a plane figure with two pairs of parallel sides of unequal lengths and four right angles, whereas a square is a special type of rectangle in which all four sides are equal in length and all angles are right angles.

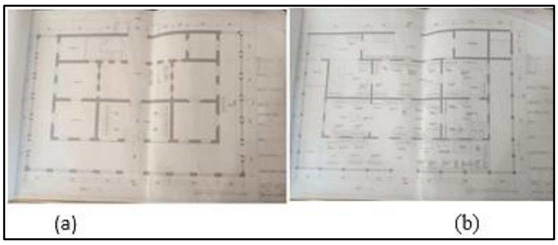

Figure 2. Floor Plan: (a) First Floor, (b) Second Floor of the Museum

As shown in Figure 2, both the first and second floors display a proportional and well- balanced arrangement of rooms, resulting in a coherent and harmonious spatial organization. This symmetrical configuration enhances the building's functionality by enabling visitors to navigate the space with ease, move comfortably, and engage in effective social interactions. The orderly layout also contributes to an intuitive and enjoyable learning environment. These findings are consistent with Purbadi et al. (2020), who highlight the role of symmetry in fostering spatial harmony and improving user comfort.

2. Pyramid Roof

The roof of the Sultan Mahmud Badaruddin II Museum is constructed in the form of a square-based pyramid, a three-dimensional geometric solid with a quadrilateral base and four triangular faces converging at a single apex. This architectural form not only enhances structural stability but also allows for efficient load distribution.

Figure 3. The Museum's Square-Based Pyramid Roof

At the roof's apex sits an ornamental finial known as a simbar, crafted in the shape of a jasmine flower. This decorative element carries symbolic meanings of majesty, protection, tradition, politeness, and harmony (Choo et al., 2022). The incorporation of a square-based pyramid roof reflects traditional Indonesian architectural principles, which emphasize beauty, simplicity, and cultural symbolism. From a functional standpoint, this design offers practical advantages, including increased building longevity, reduced maintenance needs, and effective rainwater drainage due to its steep slope, thereby preventing water accumulation and minimizing the risk of structural damage.

In addition to its three-dimensional form, the roof also integrates two-dimensional geometric patterns, most notably trapezoids. A trapezoid is defined as a quadrilateral with exactly one pair of parallel sides of unequal lengths (Ikawati & Wardana, 2022). The use of trapezoidal shapes enhances the roof's distinctive visual appeal and contributes to spatial harmony within the traditional architectural layout. As noted by Luntungan et al. (2022), the presence of trapezoidal elements exemplifies how plane figures can be seamlessly incorporated into architectural designs that both reflect and preserve local cultural identity.

3. Cylindrical Columns

The Sultan Mahmud Badaruddin II Museum incorporates cylindrical columns as key architectural elements, serving both structural and aesthetic functions. A cylindrical column is defined as three-dimensional solids with two parallel circular bases connected by a curved surface. In the museum's structure, these columns provide effective support for the roof and floors, while evenly distributing loads to the foundation (Ali & Hakim, 2024).

From a functional perspective, cylindrical columns offer superior load-bearing capacity and structural stability compared to square or rectangular columns. Aesthetically, they contribute to the building's elegance and visual harmony. Khanza (2023) highlights that composite cylindrical columns can achieve an optimal balance between strength and visual appeal. Furthermore, Mahardika et al. (2023) emphasize that the selection of materials and geometric forms, including cylindrical designs, plays a crucial role in ensuring the structural strength, durability, and longevity of a building (Figure 4).

Figure 4. Cylindrical Columns of the Museum

4. Flooring

The flooring of the Sultan Mahmud Badaruddin II Museum exhibits diversity in both material and geometric patterns. The first floor, which has been renovated, is paved with square granite tiles, while the second floor retains its original tembesu wooden flooring, supported by wooden frames and H-beam steel structures.

Across the museum, flooring designs predominantly feature square and rectangular shapes, consistent with the definitions provided in the symmetrical floor plan section. On the first floor, the use of square granite and ceramic tiles is paired with rectangular wooden tiles on the second floor, reflecting a deliberate balanced between aesthetics, functionality, and material sustainability.

The selection of flooring materials was influenced by considerations of strength and durability, while also maintaining visual appeal and architectural harmony. As observed by Liu (2025) and Ridhwan et al. (2025), the appropriate choice of material and geometric form not only enhances user comfort but also preserves the cultural and historical of heritage buildings (Figure 5).

Figure 5. Square and Rectangular Floor Tiles

5. Doors and Windows

The main entrance of the Sultan Mahmud Badaruddin II Museum consists of three arched gateways, each measuring approximately 3.5 meters in height and 3 meters in width. Most interior doors employ a double-leaf designs with dimensions of 2.4 \times 1.5 meters, and several incorporate upper ventilation panels. These gateways combine rectangular frames with curved tops, creating a harmonious blend of functional and aesthetic elements (Figure 6).

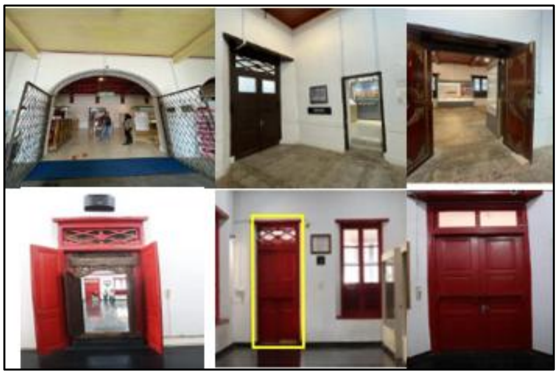

Figure 6. Museum Doors

Historically, rectangular doors in traditional architecture have been closely associated with classical aesthetics and cultural identity. At the museum, this design-enhanced by curved upper sections-produces a visually striking façade, improves accessibility and air circulation, and strengthens cultural connection with visitors (Li & Huang, 2020; Cobut et al., 2015).

The museum's windows, while exhibiting variations in style and material, generally maintain consistent dimensions of approximately 2.2 \times 1.5 meters with a wall thickness of around 60 cm. These include traditional krepyak wooden shutters, glass-panel combinations, and semi-circular ventilation forms (Figure 7). Rectangular windows, widely used in various cultural contexts, are effective in optimizing natural light, improving ventilation, and creating a sense of spatial openness (Lazmi & Ikaputra, 2021). Frequently framed with ornamental details, these windows highlight structural beauty while maintaining their functional purpose (Rapi et al., 2024). From an educational standpoint, such geometric elements, rectangles, arches, and semi-circular forms can be meaningfully integrated into mathematics instruction. By connecting these real-world architectural features with formal geometric concepts, teachers can foster contextualized learning experiences that align with the principles of culturally responsive mathematics education (Salsabila & Soebagyo, 2023).

Figure 7. Museum Windows

6. Stairs

The staircases of the Sultan Mahmud Badaruddin II Museum incorporate multiple geometric concepts, including symmetry, circles, similarity, plane figures, solid figures, and geometric transformations. The museum features two main types: exterior stairs, located at the front and rear, each consisting of 21 concrete steps with widths ranging from 2.7 to 3 meters and handrails measuring approximately 0.40 meters in thickness; and interior wooden stairs, 1.3 meters wide, comprising 24 steps separated by a central landing (Figure 8).

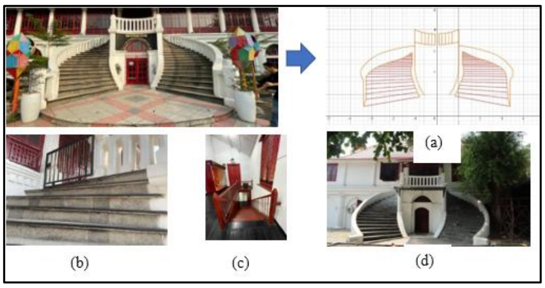

Figure 8. Museum Stairs

The symmetrical circular stairs [Figure 8(a)], located on both sides of the building, display reflectional and rotational symmetry. The arcs formed by these stairs illustrate concepts of curvature and radial distance, while the sequential arrangement of steps in the shape of cuboids. The straight exterior stairs [Figure 8(b)] exemplify similarity and translation through uniformly sized steps in the shape of cuboids. The straight interior stairs [Figure 8(c)] integrate rectangular elements with parallelogram-shaped handrails, forming an inclined structure characterized by repetitive step patterns. The circular stairs with central access [Figure 8(d)] combine vertical symmetry with translational and rotational patterns, reinforcing concepts of geometric transformation.

The integration of symmetry in stair design not only enhances visual harmony and balance but also contributes to visitor comfort. These stairs serve as focal architectural features that add aesthetic value to the museum's spatial layout. As noted by Alharron et al. (2021), staircases that are both aesthetically pleasing and ergonomically designed can significantly improve the user experience. Furthermore, Amelia et al. (2024) highlight the role of such designs in encouraging physical activity within public spaces, thereby contributing to a more visitor-friendly museum environment.

7. Roof Support

The roof support structure of the Sultan Mahmud Badaruddin II Museum is predominantly composed of interconnected right-angled and isosceles triangles, forming a rigid and durable framework (Figure 9).

Figure 9. Roof Support Structure of the Museum

The geometric elements of this structure consist of points, lines, and planes. The intersections of the iron rods function as nodes for force distribution, while the rods themselves serve as structural lines forming the sides of the triangles. These interconnected components create both flat and inclined planes that facilitate optimal load distribution and contribute significantly to the building's overall stability. The arrangement also exhibits a repetitive translational pattern along the roof corridor, reflecting geometric principles of similarity, order, and transformation.

The use of triangular configurations in roof trusses is a fundamental principle in civil engineering and architecture. Triangles are inherently rigid and resistant to deformation, enabling them to bear loads efficiently. Wismantoro & Yuniastuti (2022) note that right-angled and isosceles triangles provide superior resistance to dynamic loads such as wind and earthquakes. Beyond structural integrity, the triangular roof design also improves spatial comfort by allowing for efficient light distribution and natural air circulation, thereby creating a healthier and more comfortable indoor environment (Ernawati et al., 2023). From a traditional architectural perspective, this design reflects indigenous engineering knowledge, as wooden triangular structures have historically demonstrated both durability and adaptability to local environmental conditions and cultural contexts.

8. Ornaments

The Sultan Mahmud Badaruddin II Museum houses a range of ornamental elements that serve both decorative and symbolic purposes, incorporating geometric principles and philosophical meanings rooted in cultural heritage of Palembang.

One prominent example is the circular logo of the Palembang Sultanate (Figure 10), which reflects the geometric definition of a circle as a set of points equidistant from a central point (Sasongko et al., 2023). Symbolically, the logo represents continuity, unity, and strength, encapsulating the integration of cultural values and historical traditions within the sultanate (My & Flowerina, 2022).

Figure 10. Logo of the Sultanate of Palembang

Another example is the ornamental Palembang cabinet adorned with rhombus motifs (Figure 11). A rhombus is a quadrilateral with all sides of equal length and diagonals that intersect at right angles (Putra et al., 2020). In Palembang culture, the rhombus is associated with togetherness, balance, and harmony. This motif also reflects the artistry and cultural knowledge passed down through generations, showcasing the community’s skill in traditional wood carving.

Figure 11. Ornamental Palembang Cabinet with Rhombus Motifs

The museum also features a cube-shaped storage jar (Figure 12), defined as a three-dimensional solid with six square faces, twelve edges, and eight vertices (Sasongko et al., 2023). The cube conveys symbolic meanings of stability and order, while its functional design supports the systematic organization of artifacts. This aligns with Primadewi & Mahesa’s (2024) observation that cubes forms in architecture facilitate efficient and organized storage systems.

Figure 12. Cube-Shaped Storage Jar

Another notable artifact is the traditional Palembang glass cabinet with a rectangular prism base (Figure 13). A rectangular prism consists of six rectangular faces with three pairs of perpendicular side. This form combines structural strength with aesthetic appeal, serving not only as storage unit for valuable items but also as a cultural symbol that preserves the traditions and historical identity of Palembang.

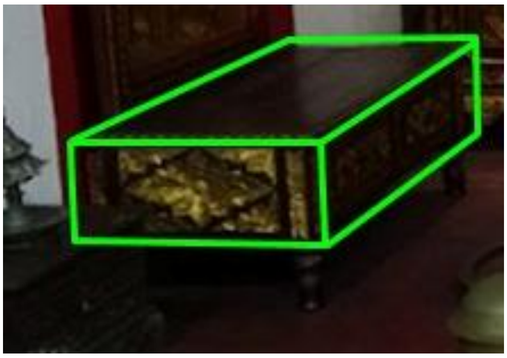

Figure 13. Traditional Palembang Glass Cabinet with Rectangular Prism Shape

Collectively, these ornamental elements demonstrate how geometric forms are deeply embedded in cultural artifacts, illustrating the interconnectedness between mathematical concepts and local heritage. This relationship underscores the museum's potential as a contextual resource for mathematics education, offering authentic examples for teaching geometry within culturally relevant settings.

D. Data Analysis and Triangulation

Analysis of visual and contextual documentation revealed that the architectural elements of the Sultan Mahmud Badaruddin II Museum consistently integrate geometric patterns such as symmetry, similarity, plane figures, solid figures, and geometric transformations, with local cultural values. These concepts are embedded across major structural and decorative components, including the floor plan, roof, columns, tiles, doors, windows, stairs, roof supports, and ornaments, creating both visual harmony and functional order that reinforce the museum's architectural identity and cultural significance.

Data triangulation was carried out by cross-referencing field observations, interviews with key informants, and theoretical literature. The results, summarized in Table 1 and 2, indicate strong consistency across all data sources, with each architectural element demonstrating alignment between empirical findings and scholarly references. This convergence strengthens the validity of the study and highlights the museum's potential as an authentic contextual resource for mathematics learning, particularly within ethnomathematical and cultural heritage-based educational frameworks.

Table 1.
Geometric Concepts and Their Ethnomathematical Significance

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No	Architectural Elements	Geometric Concept	Ethnomathematical Significance
1	Floor Plan	Square, Rectangle, Symmetry	Order, Cohesion, Social Harmony
2	Pyramid Roof	Square-based Pyramid, Trapezoid	Grandeur, Protection, Cultural Nobility
3	Column	Cylindrical Column	Stability, Strength, Architectural Elegance
4	Tile	Square, Rectangle	Balance, Spatial Efficiency
5	Doors and Windows	Rectangle, Arch	Spatial Connectivity, Visual Aesthetics
6	Stairs	Symmetry, Circle, Geometric Transformation, Parallelogram	Accessibility, Visual Balance
7	Roof Support Structure	Triangle	Stability, Structural Strength
8	Museum Ornaments	Circle, Rhombus, Cube, Rectangular Prism	Unity, Togetherness, Cultural Order

Table 1 summarizes the relationship between each architectural element, its associated geometric concept, and its ethnomathematical significance. The findings reveal that geometric principles are embedded in both the structural and decorative aspects of the museum, reflecting Palembang's cultural values while offering potential applications in contextualized mathematics education.

Table 2.
Data Triangulation Results

No	Architectural Element	Observation Data	Interview Data	Theoretical References	Triangulation Conclusion
1	Floor Plan	Square, Rectangle, Symmetry	Representation of order and spatial circulation	Purbadi et al. (2020)	Consistent
2	Pyramid Roof	Square-based Pyramid, Trapezoid	Symbol of protection and grandeur	Choo et al. (2022); Ikawati & Wardana (2022); Luntungan et al. (2022)	Consistent
3	Column	Cylindrical Column	Structural stability and aesthetics	Khanza (2023); Ali & Hakim (2024); Mahardika et al. (2023)	Consistent
4	Tile	Square, Rectangle	Aesthetics and sustainability	Liu (2025); Ridhwan et al. (2025)	Consistent
5	Doors and Windows	Rectangle, Arch	Aesthetics and interior-exterior visual connection	Li & Huang (2020); Cobut et al. (2015); Lazmi & Ikaputra (2021); Rapi et al. (2024); Salsabila & Soebagyo (2023)	Consistent
6	Stairs	Symmetry, Circle, Geometric Transformation, Parallelogram	Facilitates circulation and symbolizes harmony	Alharron et al. (2021); Amelia et al. (2024)	Consistent
7	Roof Support Structure	Triangle	Stability and structural strength	Wismantoro & Yuniastuti (2022); Ernawati et al. (2023)	Consistent
8	Museum Ornaments	Circle, Rhombus,	Cultural symbol and aesthetic	Sasongko et al. (2023); My & Flowerina (2022); Putra et	Consistent

No	Architectural Element	Observation Data	Interview Data	Theoretical References	Triangulation Conclusion
		Cube, Rectangular Prism	beauty	al. (2020); Primadewi & Mahesa (2024)	

Table 2 presents the triangulation results, showing consistent alignment between observational data, interview findings, and theoretical references. This consistency reinforces the credibility of the study and supports the conclusion that the museum represents a coherent integration of geometric concepts and cultural symbolism, making it an effective and authentic resource for ethnomathematics-based mathematics instruction.

E. Ethnomathematical Interpretatio

The findings indicate that the geometric elements embedded in the architecture of the Sultan Mahmud Badaruddin II Museum function both as structural components and as representations of Palembang's cultural values and philosophical concepts. The square-based pyramid roof symbolizes grandeur and protection, while the symmetry found in floor plans and stairs reflects social harmony and balance. The rhombus motif in ornamental carvings signifies togetherness and order in a multicultural society, and the circular logo of the Palembang Sultanate represents historical continuity and cultural unity. Cylindrical columns and triangular roof trusses emphasize structural strength and stability, illustrating traditional engineering knowledge, whereas cubes and rectangular prisms forms in cabinets and storage jars symbolize order, efficiency, and systematic organization.

From a mathematics education perspective, these architectural features provide a rich contextual foundation for integrating local culture into geometry learning. Square and rectangular elements, such as floor plans, tiles, doors, and windows, can be applied in teaching area and perimeter, while three-dimensional forms, including the pyramid roof, columns, rectangular cabinets, and cube-shaped jars support learning about volume and surface area. Furthermore, the stairs, with their translational and rotational patterns, serve as tangible examples for teaching geometric transformations, including translation, rotation, and reflection.

This approach aligns with D'Ambrosio's (1985) ethnomathematics framework, which emphasizes that mathematics should be understood within its cultural and historical contexts. It also reflects Bishop's six universal mathematical activities (Tesfamicael et al., 2021) as manifested in the museum: (1) counting the number of columns, steps, and rooms; (2) measuring dimensions of doors, stairs, columns, and spatial layout; (3) designing symmetrical structures, floor patterns, and ornamental motifs; (4) locating through spatial arrangements and building orientation; (5) explaining symbolic meanings of shapes, roof designs, and building materials; and (6) playing through the interpretation od ornaments and carving motifs.

The museum's geometric features are realistic and contextually rich, consistent with the principles of Indonesian Realistic mathematics Education (PMRI) (Zulkardi et al., 2020; Revina et al., 2019), where students construct mathematical understanding from real-world problems grounded in their local environment. Supporting prior research (Setiana et al., 2021), museums serve as authentic contexts for introducing geometry concepts, developing spatial reasoning, visualization skills, and conceptual understanding.

Additionally, culture-based project-based learning in museum settings enables students to observe, measure, and analyze geometric elements in cultural artifacts (Kurniawan et al., 2023; Setyowati et al., 2023), while fostering 21st-century skills (Ngadiso et al., 2021). These findings emphasize the importance of curriculum development that integrates local wisdom to create relevant and meaningful learning experiences, strengthen cultural identity, and enhance teachers' competencies in designing contextual mathematics lessons (Musthofa & Indartono, 2020; Mulyani et al., 2023). Furthermore, museums can serve as effective platforms for teacher training in developing culturally responsive pedagogies (Kortjass, 2019; Casi & Sabena, 2024). Therefore, museum-based ethnomathematics has significant potential to make geometry learning more engaging, relevant, and connected to students' real-life experiences.

IV. CONCLUSION

This study concludes that the Sultan Mahmud Badaruddin II Museum in Palembang embodies a variety of geometric concepts, such as squares, rectangles, square-based pyramids, trapezoids, cylindrical columns, triangles, circles, rhombuses, cubes, and rectangular prisms-each integrated with local cultural values. Architectural elements, from floor plans to ornamental details, function not only as structural features but also as symbolic symbolic representations of the philosophy and identity of the Palembang community. Viewed through an ethnomathematical perspective, the museum serves as an authentic learning resource that bridges mathematical concepts with cultural contexts.

The findings affirm the museum's potential as a meaningful setting for introducing mathematical topics such as area, volume, geometric transformations, and measurement through approaches closely linked to students' daily lives. These results support the integration of Project-Based Learning (PjBL) and cultural exploration to enhance student engagement, strengthen spatial literacy, and deepen conceptual understanding. The study also highlights the importance of embedding local wisdom in curriculum design and providing teacher training to develop contextual and culturally responsive mathematics instruction.

This study recommends that educators utilize cultural heritage sites, such as the Sultan Mahmud Badaruddin II Museum, to deliver contextual and authentic mathematics learning experiences that foster spatial literacy. For curriculum developers can incorporate ethnomathematics-based content into geometry curricula to systematically embed cultural contexts in teaching materials. For teacher professional development can offer training on designing and implementing mathematics lessons that integrate cultural artifacts, emphasizing approaches like PMRI and PJBL. For future research can broaden ethnomathematical studies to other cultural heritage sites in Palembang and beyond for comparative insights into the relationship between geometry and culture.

In sum, museum-based ethnomathematics holds significant potential to connect mathematics with culture and students lived experiences, while simultaneously supporting cultural preservation through educational practices.

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REFERENCES

Afriansyah, E. A. (2022). Peran RME terhadap miskonsepsi siswa MTs pada materi bangun datar segi empat. *Mosharafa: Jurnal Pendidikan Matematika*, *11*(3), 359-368. https://doi.org/10.31980/mosharafa.v11i3.727

Agustin, F., Putri, M. A., Amanda, C. S., Restiawan, I. M. A. N., & Nurul Husnah Mustika Sari. (2024). Eksplorasi Etnomatematika pada Konsep Geometri dalam Ornamen Ukiran Khas Bali Kuno. *Seminar Nasional Tadris Matematika,* 177–190.

Alharron, D., Gillan, D. J., & Lei, C. (2021). Scientific and Design Understandings of Aesthetics. *Proceedings of the Human Factors and Ergonomics Society Annual Meeting*, 380–384. https://doi.org/10.1177/1071181321651242

Ali, A. M., & Hakim, D. I. (2024). Eksplorasi Masalah Isoperimetrik pada Bangun Ruang. *Euler: Jurnal Ilmiah Matematika, Sains Dan Teknologi*, *12*(1), 16–25.

Amelia, K. P., Cardiah, T., Liritantri, W., Mahendra, B., & Ammara, K. (2024). Threshold Space: Ruang Antara dari Alun-alun Cicendo, Bandung. *Jurnal Lingkungan Binaan (Space: Journal of the Built Environment)*, *11*(1). https://doi.org/10.24843/jrs.2024.v11.i01.p01

Andersson, A., Foyn, T., Simensen, A. M., & Wagner, D. (2023). Storylines in Voices of Frustration: Implications for Mathematics Teacher Education in Changing Times. *Education Sciences*, *13*(8), 816.

Bishop, A. J. (1994). *Cultural Conflicts in* Mathematics *Education : Developing a Research Agenda*. *14*(2), 15–18.

Casi, R., & Sabena, C. (2024). Mathematics in Art and History Museums: An Informal Mathematics Education Case for Teachers' in-Service Training. *Education Sciences*, *14*(5), 489.

https://doi.org/10.3390/educsci14050489

Chitima, S. S., & Mmakola, N. (2023). They Prefer the Museum in a More Colourful Outfit': Perceptions of Millennials Towards Zimbabwe's Museums. *ICOFOM Study Series*, *50–2*, 44–55.

Choo, I. A. H., Rashid, M. S. A., Alaudin, K., & Jamaludin, N. H. (2022). The Significance of Roof Decorative Architectural Components of Rumah Limas Bumbung Perak (RLBP) Towards Heritage Interpretation of Perak Tengah. *Planning Mayasia Journal*, *20*(3). https://doi.org/10.21837/pm.v20i22.1130

Cobut, A., Beauregard, R., & Blanchet, P. (2015). Reducing the Environmental Footprint of Interior Wood Doors in Non-Residential Buildings-Part 2: Ecodesign. *Journal of Cleaner Production*, 1–13. https://doi.org/DOI: 10.1016/j.jclepro.2015.05.068

D'Ambrosio, U. (1985). Ethnomathematics and Its Place in the History and Pedagogy of Mathematics. *For the Learning of Mathematics*, *5*(1), 44–48.

D'Ambrósio, U., & Knijnik, G. (2020). Ethnomathematics. In *Encyclopedia of Mathematics Education*, 283–288. https://doi.org/10.1007/978-3-030-15789-0_60

D'Ambrosio, U., & Paulo, S. (2001). General Remarks on Ethnomathematics. *ZDM - International Journal on Mathematics* Education, *33*(3), 67–69. https://doi.org/10.1007/BF02655696

Djumrianti, D., Abdillah, A. F., & Lisnini. (2024). The Influence of Cultural Acculturation (Social, Customs and Arts) in the Past on Palembang Songket Motifs. *In 7th FIRST 2023 International Conference on Global Innovations (FIRST-T3 2023). Atlantis Press*, 25–38.

Ernawati, A., Hidayat, R., Dwiputri, M., Widyawati, K., Murodif, A., Budiarto, A., Ferdian, & Irwansyah, Y. (2023). Struktur Atap Tradisional Kayu pada Masjid Bersejarah Abad ke-16 di Jakarta Studi Kasus: Masjid Al-Alam Marunda dan Masjid Al-Alam Cilincing. *Lakar: Jurnal Arsitektur*, *6*(1), 114–122.

Hartatiana, Wulansari, N. A., Efriani, A., Paradesa, R., Wardani, A. K., & Muslimahayati. (2023). Ethnomathematics in Gending Sriwijaya dance as a context for student worksheets. *AIP Conference Proceedings*, 020010. https://doi.org/10.1063/5.0142272

Herawaty, D., & Widada, W. (2018). *The Influence of Contextual Learning Models and the Cognitive Conflict to* Understand *Mathematical Concepts and Problems Solving Abilities*. *218* (ICoMSE 2017), 96–102. https://doi.org/10.2991/icomse-17.2018.17

Ikawati, & Wardana, M. D. K. (2022). Konsep Bangun Datar Sekolah Dasar pada Struktur Candi Pari Sidoarjo. *Jurnal Basicedu*, *6*(5), 8188–8198. https://doi.org/10.31004/basicedu.v6i5.3776

Iwuanyanwu, O., Gil-Ozoudeh, I., Okwandu, A. C., & Ike, C. S. (2024). The Role of Green Building Materials in sustainable

Architecture: Innovations, Challenges, and Future Trends. *International Journal of Applied Research in Social Sciences*, *6*(8), 1935–1950.

Jia, L., & Meng Zhang. (2023). Research on the Strategies of Integrating Mathematics Culture Into Higher Mathematics Classroom Teaching. *Proceedings of the 2023 IEEE 12 Th International Conference on Educational and Information Technology (ICEIT)*, 57125–57131. https://doi.org/10.1109/ICEIT57125.2023.10107888

Khanza, M. (2023). Perencanaan Kolom Komposit Silinder pada Terminal Bandara. *RekaRacana: Jurnal Teknik Sipil*, *9*(1), 67–76.

Knijnik, G. (2024). Ethnomathematics from a Political Perspective. In *In Ethnomathematics and Mathematics Education: International Perspectives in Times of Local and Global Change* (pp. 257–273). Cham: Springer Nature Switzerland.

Kortjass, M. (2019). Enriching Teaching Through Artefacts: An Early Childhood Mathematics Teacher Educator's Self-Study Project. Educational *Research for Social Change*, *8*(1), 70–85. https://doi.org/10.17159/2221-4070/2018/v8i1a5

Kristial, D., Soebagjoyo, J., & Ipaenin, H. (2021). Analisis biblometrik dari istilah "Etnomatematika." *Kognitif: Jurnal Riset HOTS Pendidikan Matematika*, *1*(2), 178–190. https://doi.org/10.51574/kognitif.v1i2.62

Kurniawan, H., Purwoko, R. Y., & Setiana, D. S. (2023). Integrating Cultural Artifacts and Tradition From Remote Regions in Developing Mathematics Lesson Plans to Enhance Mathematical Literacy. *Journal of Pedagogical Research*. https://doi.org/10.33902/jpr.202423016

Lazmi, A. N., & Ikaputra. (2021). Elemen Arsitektur pada Bangunan Bekas Industri Pabrik Gula Colomadu, Karanganyar, Jawa Tengah. *Jurnal Arsitektur Pendapa*, *4*(2), 1–9.

Li, R., & Huang, H. (2020). Visual Access Formed by Architecture and its Influence on Visitors' Spatial Exploration in a Museum. *Interdisciplinary Journal of Signage and Wayfinding*, *4*(1), 49–59. https://doi.org/10.15763/issn.2470-9670.2020.v4.i1.a55

Lisnani, L., & Gustira, R. (2023). Exploration of the Sultan Mahmud Badaruddin Jayowikramo Grand Mosque in South Sumatra: An ethnomathematics study. *Jurnal Elemen*, *9*(2), 317–333. https://doi.org/10.29408/jel.v9i2.12280

Lisnani, L., Zulkardi, Z., Putri, R. I. I., & Somakim, S. (2020). Etnomatematika: Pengenalan Bangun Datar Melalui Konteks Museum Negeri Sumatera Selatan Balaputera Dewa. *Mosharafa: Jurnal Pendidikan Matematika*, *9*(3), 359–370. https://doi.org/10.31980/mosharafa.v9i3.754

Lisnani, Putri, R. I. I., Zulkardi, & Somakim. (2022). Studi Etnomatematika: Rumah Limas di Museum Negeri Sumatera Selatan Balaputera Dewa. *Teorema: Teori Dan Riset Matematika*, *7*(September), 351–364.

Liu, B. (2025). Biomechanical Model Study on the *Effect* of Floor Materials on Walking Stability in Tea Space Design. *Molecular & Cellular Biomechanics*, *22*(1), 987. https://doi.org/https://doi.org/10.62617/mcb987

Luntungan, T. S., Kwanda, T., & Hariyanto, A. D. (2022). Kriteria Desain Fasad *Apartemen* dengan Pendekatan Regionalisme di Surabaya. *Advances in Civil Engineering and Sustainablw Architecture*, *4*(2), 47–60.

Mahardika, I. K., Idedhyana, I. B., & Lestari, A. P. U. P. (2023). Arsitektur Biomorfik pada Perancangan Taman Florikultura di Kota Denpasar. *Jurnal Teknik Gradien*, *15*(1), 52–64.

Mandaka, M., Ningrum, M., & Nuzuluddin, T. R. (2023). Spatial Pattern of Museum Visitors' Circulation. *Jurnal Ilmiah Arsitektur*, *13*(2), 178–187.

Mulyani, M., Bakthawar, P., & Munir, S. (2023). Integrating Group Investigation Method and Local Wisdom to Enhance Students' Writing Skill. *Ta Dib*, *26*(1), 125. https://doi.org/10.31958/jt.v26i1.8610

Musthofa, Z., & Indartono, S. (2020). Disaster Mitigation Curriculum-Based on Local Wisdom to Support Sustainable Development Programs. *In 2nd International Conference on Social Science and Character Educations (ICoSSCE 2019)*, 97–102. https://doi.org/10.2991/assehr.k.200130.021

My, F. M., & Flowerina, I. (2022). Penyampaian Makna dan Identitas dari Logo Baru Museum Sumpah Pemuda Jakarta sebagai Bentuk Komunikasi Visual. *Jurnal Penelitian Dan Pengkajian Ilmiah Sosial Budaya*, *1*(2), 291–300.

Neonbasu, G., Lake, R. C., Jeraman, P., Morakinyo, K. O., & Ilesanmi, S. (2024). *Architecture* in Anthropological Perspective: Structural Reflection on Local Architectural Dynamics. *Local Wisdom*, *16*(1), 18–28.

Ngadiso, N., Sarosa, T., Asrori, M., Drajatı, N. A., & Handayani, A. (2021). Project-Based *Learning* (PBL) in EFL Learning: Lesson From Indonesia. *Al-Ishlah Jurnal Pendidikan*, *13*(2), 1114–1122. https://doi.org/10.35445/alishlah.v13i2.558

Nova, I. S., & Putra, A. (2022). Eksplorasi etnomatematika pada cerita rakyat. *Plusminus: Jurnal Pendidikan Matematika*, *2*(1), 67-76. https://doi.org/10.31980/plusminus.v2i1.1085

Nursyamsiah, M., Pusitasari, N., & Mardiani, D. (2024). Eksplorasi Etnomatematika pada Motif Batik Pasiran Garut ditinjau dari Aspek Matematis. *Jurnal Inovasi Pembelajaran Matematika: PowerMathEdu*, *3*(1), 91-100. https://doi.org/10.31980/pme.v3i1.1562

Presmeg, N. (2020). *Visualization and Learning in Mathematics Education*. Encyclopedia of Mathematics Education, 900–904.

Primadewi, S. P. N., & Mahesa, I. K. Y. (2024). Penerapan Arsitektur Ekologis pada Rumah Makan Apung sebagai Strategi Pariwisata Berkelanjutan di

Pulau Serangan. *Jurnal Latar*, *2*(1), 110–118.

Purbadi, Y. D., Lake, R. C., & Arinto, F. X. E. (2020). The Symbolic Regionalism on The Achitectural Expression Design of Kupang Town-Hall. *Journal of Design and Built Environment*, *20*(3), 71–84.

Putra, R. Y., Wijayanto, Z., & Widodo, S. A. (2020). Ethnomathematics: Soko Tunggal Mosque for Geometry 2D Learning. *JRPIPM: Jurnal Riset Pendidikan dan Inovasi Pembelajaran Matematika*, *4*(1), 10–22.

Prabawati, M. N., Mulyani, E., & Muslim, S. R. (2024). Determining Auspicious Days for Weddings and Circumcisions in Kuta Traditional Village. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(2), 301-314. https://doi.org/10.31980/mosharafa.v13i2.1733

Rapi, A., Amin, S. F. A., Amalia, A. A., Amal, C. A., Syahruddin, A. S., & Yusri, A. (2024). Identifikasi Penerapan Prinsip Arsitektur Neo Vernakuler pada Perancangan Bangunan Rest Area Type A di Kota Palopo. *Journal of Muhammadiyah's Application Technology*, *3*(3), 197–203.

Rawani, D., Putri, R. I. I., Zulkardi, & Susanti, E. (2023). Explore the South Sumatera's traditional dance as the concept to support mathematical learning. *AIP Conference Proceedings*, 020028. https://doi.org/10.1063/5.0142305

Revina, S., Koon, F., & Leung, S. (2019). Issues involved in the Adoption of Realistic Mathematics Education in Indonesian culture. *Compare: A Journal of Comparative and International Education*, *00*(00), 1–20. https://doi.org/10.1080/03057925.2019.1650636

Riadi, A., Turmudi, T., & Juandi, D. (2024). Trends of Ethnomathematics Research in Indonesia: A Bibliometric Analysis from the Scopus Database. *Mosharafa: Jurnal Pendidikan Matematika*, *13*(2), 401-414. https://doi.org/10.31980/mosharafa.v13i2.1499

Ridhwan, M., Wibowo, D. D., & Susila, D. A. (2025). Terapan Ornamen Geometris Jepara pada Meja Kerja Guru di SMK Hasan Kafrawi Jepara. *Besaung: Jurnal Seni, Desain Dan Budaya*, *10*(1), 100–116.

Rosa, M., & Orey, D. C. (2021). An Ethnomathematical Perpective of STEM Education in a Glocalized World. *Bolema: Boletim de Educação Matemática*, *35*(70), 840–876.

Salsabila, S. A., & Soebagyo, J. (2023). Ethnomathematics Exploration at Cut Meutia mosque. *Math Didactic: Jurnal Pendidikan Matemaika*, *9*(2), 293–307. https://doi.org/10.33654/math.v9i2.2275

Sanita, E., Zulkardi, Susanti, E., & Meryansumayeka. (2024). Desain Pembelajaran Refleksi Geometri Menggunakan Pendekatan PMRI dengan Konteks Songket Prada Palembang. *Indiktika: Jurnal Inovasi Pendidikan Matematika*, *7*(1), 246–260.

Sari, A., Ilma, R., Putri, I., Charitas, R., & Prahmana, I. (2024). Ethnomathematics in Indonesian Woven Fabric : The Promising Context in Learning Geometry. *Mathematics*

Teaching Research Journal, *16*(5), 157–185.

Sasongko, D. F., Dinarti, S., Qomariyah, U. N., Agustina, & Nasikhah, S. (2023). Eksplorasi Etnomatika Konsep Geometri SD pada Arsitektur Masjid Agung Baitul Mukminin Jombang. *Edumath*, *16*(1), 25–40.

Setiana, D. S., Ayuningtyas, A. D., Wijayanto, Z., & Kusumaningrum, B. (2021). Eksplorasi Etnomatematika Museum Kereta Kraton Yogyakarta dan Pengintegrasiannya ke dalam Pembelajaran Matematika. *Ethnomatematics Journal*, *2*(1), 1–10.

Setyowati, S., Rakhmawati, N. I. S., Fitri, R., Saroinsong, W. P., & Simatupang, N. D. (2023). Project-Based Learning in Improving Early Childhood Children's Ability to Know Social and Geographical Environments. *Jurnal Obsesi Jurnal Pendidikan Anak Usia Dini*, *7*(3), 3461–3467. https://doi.org/10.31004/obsesi.v7i3.4653

Spradley, J. P. (1979). *The ethnographic interview.* America: Holt Reinhart and Winston.

Sulistiawan, A. P., Rafi, M., D.A, S. S., S, S. T., & Hadi, M. A. (2023). Identifikasi Ornamen Art Deco Pada Eksterior Gedung Merdeka Bandung. *Jurnal Arsitektur Terracotta* *4*(3), 249–263.

Susanto, Setiawan, T. B., & Daniaty, H. (2023). Ethnomathematics in the Main Building of Pendapa Sabha Swagata Blambangan. *Mosharafa: Jurnal Pendidikan Matematika*, *12*(3), 493-504. https://doi.org/10.31980/mosharafa.v12i3.822

Syafriafdi, N., Fauzan, A., Arnawa, I. M., Anwar, S., & Widada, W. (2019). The Tools of Mathematics Learning based on Realistic Mathematics Education Approach in Elementary School to Improve Math Abilities. *Universal Journal of Educational Research*, *7*(7), 1532–1536. https://doi.org/10.13189/ujer.2019.070707

Tesfamicael, S. A., Nakken, A. H., Tumebo, T., & Peter Barry Gray. (2021). Curriculum Implication of Using Ethnomathematics to Promote Student Learning in Ethiopia. *Journal of Mathematics and Culture*, *15*(3), 86–123.

Utari, S. D., Agustin, M. L., Dzikri, A. M., & Ayundasari, L. (2021). Perancangan Aplikasi Virtual Reality Cagar Budaya untuk Pembelajaran Sejarah Lokal. *Historia: Jurnal Pendidik Dam Peneliti Sejarah*, *4*(2), 103–114. https://doi.org/10.17509/historia.v4i2.25740

Vozniak, E., Kurbatov, Y. E., & Lisovsky, V. (2020). Classical Order Theory in the Modern Architectural Educational Process. *E3s Web of Conferences*, 6.

Wibawa, F. S., Nurhikmayati, I., & Kania, N. (2024). Cultural Perspectives in Geometry: Designing Ethnomathematics-Inspired Educational Tools for Geometric Thinking. *Plusminus: Jurnal Pendidikan Matematika*, *4*(3), 453-470. https://doi.org/10.31980/plusminus.v4i3.2276

Widada, W., Herawaty, D., Anggoro, A. F. D., Yudha, A., & Hayati, M. K. (2019). Ethnomathematics and Outdoor Learning to Improve Problem Solving Ability. *295(ICETeP 2018), 13–16.* https://doi.org/10.2991/icetep-18.2019.4

Widharetno, A., & Saleh, M. (2022). Ketentuan Pemecahan Tanah Kavling Peroangan dan Penjualan Tanah Kavling Perorangan di Kabupaten Jombang. *Jurnal Hukum Magnum*, *5*(2), 184–195.

Wismantoro, B. D., & Yuniastuti, T. (2022). Kajian Perilaku Kolom Struktur Lambang Gantung Pendopo Agung Mangkubumen terhadap Beban Aksial. *Jurnal Arsitektur Pendapa*, *5*(1), 1–7.

Zulkardi. (1999). How to design Mathematics Lessons based on the Realistic Approach. *RME: Realistic Mathematics Education*, 1–17.

Zulkardi, Putri, R. I. I., & Wijaya, A. (2020). Two Decades of Realitstic Mathematics Education in Indonesia. In *International Reflections on the Netherlands Didactics of Mathematics* (pp. 325–340). Springer Netherlands.

Author's Biography

Dina Octaria, S.Si., M.Pd.

Born in Palembang on October 5, 1987. Currently serves as a lecturer in the Mathematics Education Study Program, Faculty of Teacher Training and Education (FKIP), Universitas PGRI Palembang. Completed undergraduate studies in Mathematics at Universitas Sriwijaya, Indralaya, in 2009, and completed a master's degree in Mathematics Education at Universitas Sriwijaya, Palembang, in 2013.

Prof. Dr. Zulkardi, M. I. Komp., M.Sc.

Born in Gunung Raya, on 20 April 1961. Faculty member at Universitas Sriwijaya. Completed undergraduate studies in Mathematics Education at Universitas Sriwijaya, Palembang, in 1984; Completed graduate studies in Computer Science at University of Indonesia in collaboration with University of Maryland, USA, in 1990; Completed graduate studies in Educational Design & Technology, University of Twente, Netherlands, in 1999; and completed doctoral studies in mathematics education, University of Twente dan Utrecht University, Netherlands, in 1999.

Prof. Dr. Ratu Ilma Indra Putri, M.Si.

Born in Palembang, on 14 August 1969. Faculty member at Faculty member at Universitas Sriwijaya. Completed undergraduate studies in Mathematics Education at Universitas Sriwijaya, Palembang, in 1992; completed graduate studies in Statistika, Institut Pertanian Bogor, Bogor, in 1999; and completed doctoral studies in Educational Measurement and Evaluation, Universitas Negeri Jakarta, Jakarta, in 2010.

Dra. Cecil Hiltrimartin, M.Si., Ph.D.

Born in Jakarta, on March 11, 1964. A lecturer in the Mathematics Education Study Program at Universitas Sriwijaya. Completed undergraduate studies in Mathematics Education at Universitas Sriwijaya in 1987; completed master's studies in Mathematics at Institut Teknologi Bandung in 1992; and completed doctoral studies in Mathematics Education at Universiti Pendidikan Sultan Idris (UPSI), Malaysia, in 2016.