

Mathematical Ideas Embedded in Betawi Wedding Symbols: An Ethnomathematics Study in Setu Babakan, Jakarta

Alya Humairo¹, Rini Setianingsih^{2*}, Mochammad Reval Ardhi Yudi Prayogo³

¹Jl. Ketintang Surabaya, Universitas Negeri Surabaya, alyahumairo@unesa.ac.id

^{2*}Jl. Ketintang Surabaya, Universitas Negeri Surabaya, rinisetianingsih@unesa.ac.id

³Jl. Ketintang Surabaya, Universitas Negeri Surabaya, mochammad.23200@mhs.unesa.ac.id

**corresponding author*

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ABSTRACT

Mathematics is often perceived as a rigid discipline detached from cultural contexts, whereas many traditional practices embody mathematical concepts. Betawi wedding symbols were chosen due to their cultural significance and their potential to reveal mathematical ideas that remain insufficiently explored. This study aims to explore ethnomathematics in Betawi wedding symbols and examine their potential as contexts for mathematics learning in schools. A qualitative approach was employed, and the study was conducted at the Betawi Cultural Village of Setu Babakan. The participants consisted of Betawi cultural figures and cultural practitioners. Data were collected through field notes, semi-structured interviews, and documentation using observation sheets, interview protocols, and documentation records as research instruments. The data were analyzed using NVivo 12 software through matrix coding techniques based on Bishop's six fundamental mathematical activities. The findings revealed that ethnomathematical exploration and mathematical context analysis of Betawi wedding symbols demonstrate their potential to serve as meaningful contexts for mathematics learning. The identified contexts include solid geometry in Peti Sie, translation in Alpie, ratio and scale in Roti Buaya. These contexts can be used as a means of constructing students' understanding of mathematical concepts through authentic cultural situations. Unlike previous ethnomathematics studies, this study connects Betawi wedding symbols with specific mathematical concepts and demonstrates their potential as meaningful contexts for school mathematics learning. Therefore, the findings indicate that local culture can be utilized as a source of mathematical learning contexts that support meaningful learning while also inspiring teachers to integrate cultural elements into the learning process.

Keywords: *Betawi Traditional Weddings, Bishop Activities, Ethnomathematics, Mathematics Learning Context.*

Ide Matematika yang Terdapat dalam Simbol Perkawinan Adat Betawi: Kajian Etnomatematika di Setu Babakan, Jakarta

ABSTRAK

Pembelajaran matematika seringkali dipandang sebagai disiplin ilmu yang kaku dan terlepas dari konteks budaya, padahal berbagai praktik tradisional menyimpan konsep matematis yang mendalam. Simbol pernikahan Betawi dipilih karena potensinya untuk

mengungkapkan gagasan matematika yang masih kurang dieksplorasi. Penelitian ini bertujuan untuk mengeksplorasi etnomatematika pada simbol-simbol perkawinan adat Betawi serta mengkaji potensinya sebagai konteks pembelajaran matematika di sekolah. Penelitian menggunakan pendekatan kualitatif yang dilaksanakan di Perkampungan Budaya Betawi Setu Babakan. Subjek penelitian terdiri atas informan tokoh budaya Betawi dan praktisi budaya Betawi. Teknik pengumpulan data dilakukan dengan membuat catatan lapangan, melakukan wawancara semi-terstruktur, dan melakukan dokumentasi dengan instrumen berupa lembar observasi, pedoman wawancara, dan dokumentasi. Analisis data menggunakan perangkat lunak NVivo 12 melalui teknik matrix coding berdasarkan enam aktivitas fundamental Bishop. Hasil penelitian menunjukkan bahwa eksplorasi etnomatematika dan analisis konteks matematika pada simbol-simbol perkawinan Betawi memiliki potensi untuk digunakan sebagai konteks yang bermakna dalam pembelajaran matematika. Konteks yang teridentifikasi meliputi geometri ruang pada Peti Sie, translasi pada Alpie, serta rasio dan skala pada Roti Buaya. Konteks-konteks tersebut dapat digunakan sebagai sarana untuk membangun pemahaman siswa terhadap konsep matematika melalui situasi budaya yang autentik. Berbeda dari penelitian etnomatematika sebelumnya, penelitian ini menghubungkan simbol-simbol perkawinan Betawi dengan konsep matematika tertentu dan menunjukkan potensinya sebagai konteks yang bermakna dalam pembelajaran matematika di sekolah. Oleh karena itu, hasil penelitian menunjukkan bahwa budaya lokal dapat dimanfaatkan sebagai sumber konteks pembelajaran matematika yang mendukung pembelajaran bermakna sekaligus menginspirasi guru untuk mengintegrasikan unsur-unsur budaya ke dalam proses pembelajaran.

Kata Kunci: *Aktivitas Bishop, Etnomatematika, Konteks Pembelajaran Matematika, Perkawinan Adat Betawi.*

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1. Introduction

Mathematics learning is closely related to the social and cultural contexts in which students live. However, mathematics is still frequently taught as an abstract and value-free discipline, causing students to perceive mathematical concepts as disconnected from their daily experiences and cultural identities. In fact, integrating cultural contexts into mathematics learning can create more meaningful, relevant, and engaging learning experiences for students (D'Ambrosio, 1985; Ladson-Billings, 1995). In sociocultural learning theory, knowledge construction is strongly influenced by social interaction and cultural practices within the community (Vygotsky et al., 1978). Therefore, culture-based mathematics learning is important not only to improve conceptual understanding but also to preserve local cultural identity amid globalization and modernization.

One approach that bridges mathematics and culture is Ethnomathematics. The concept of ethnomathematics was introduced by D'Ambrosio (1985) during the 3rd International Congress on Mathematical Education (ICME) in 1976 as a critique of mathematics education that largely ignored cultural and social dimensions. Ethnomathematics emphasizes that mathematical ideas emerge from cultural practices, traditions, and human activities in different communities (D'Ambrosio, 1985). Furthermore, Bishop (1985) argued that mathematics is a cultural product reflected through six universal mathematical activities, namely counting, measuring, locating,

designing, playing, and explaining. These activities represent how mathematical thinking develops naturally within cultural practices and daily life. Thus, ethnomathematics provides an important framework for connecting formal mathematics learning with students' cultural backgrounds and experiences. Bishop's six mathematical activities are particularly appropriate for analyzing Betawi wedding symbols because these symbols are embedded in cultural practices involving patterns, measurements, spatial arrangements, and traditional activities. The framework therefore enables the identification of mathematical ideas within the cultural meanings and practices associated with Betawi wedding symbols.

Indonesia possesses abundant cultural diversity that can serve as a rich source of ethnomathematics exploration. Traditional practices, ceremonies, arts, architecture, music, and local artifacts contain mathematical concepts embedded within cultural values and philosophies ([Hariyati, 2023](#); [Rosa & Orey, 2011](#); [Hidayat et al., 2025](#); [Setianingsih et al., 2024](#)). One cultural tradition rich in symbolic meaning is the traditional wedding ceremony. Previous studies have shown that traditional wedding rituals in various Indonesian cultures contain symbolic representations related to social values, harmony, respect, spirituality, and community identity. For example, [Sulaiman & Kurniasari \(2025\)](#) found that the Khodeah ceremony in Butonese weddings symbolizes hope, respect, and family harmony. Similarly, [Sriyana & Hiskiya \(2020\)](#) reported that each stage of the Dayak Ngaju wedding ceremony reflects philosophical meanings that guide social life. These findings indicate that traditional wedding ceremonies are cultural practices rich in symbolic artifacts and activities that can potentially be explored from an ethnomathematics perspective.

Among Indonesia's cultural communities, the Betawi ethnic group represents the indigenous culture of Jakarta. However, the rapid urbanization and modernization occurring in Jakarta have increasingly marginalized Betawi cultural identity. Urbanization has contributed to significant social and cultural transformations, causing local traditions and cultural practices to gradually disappear in modern urban life ([Kamin, 2025](#); [Nugraha & Indriani, 2022](#)). Today, Betawi cultural heritage is preserved only in limited areas such as Setu Babakan, Marunda Village, Condet, and several other communities that continue to maintain traditional Betawi customs and cultural practices ([Rahmawati, 2022](#); [Sholihah, 2024](#); [Sudrajat & Liauw, 2022](#)). If these traditions are not continuously preserved and integrated into educational contexts, Betawi cultural identity may gradually fade due to the influence of globalization and urban culture.

In more modern and densely populated areas, such as Central Jakarta, West Jakarta, and much of North Jakarta, the authenticity of Betawi culture is beginning to erode due to urbanization, modernization, and the increasing number of immigrants from various regions. As a result, Betawi cultural identity is increasingly difficult to find in everyday life. If not protected and preserved, Betawi culture will be threatened by changing times and face extinction. To mitigate the negative impacts of urbanization, cultural preservation can be achieved through cultural outreach and education ([Busrah & Pathuddin, 2021](#); [Kamin, 2025](#)).

One effort to preserve local culture through education is by integrating cultural practices into mathematics learning through ethnomathematics. Ethnomathematics-based learning enables students to connect mathematical concepts with real cultural experiences, making learning more contextual and meaningful ([Bishop, 1985](#); [Jubaidah & Mandasari, 2025](#); [Muhakimah & Arfinanti, 2024](#); [Orey & Rosa, 2008](#); [Putri et al., 2024](#); [Utami et al., 2026](#)). In the context of Betawi culture, traditional wedding ceremonies provide rich cultural symbols that can be analyzed mathematically. Various wedding artifacts such as Tenong, Roti Buaya, Peti Sie, Siangko, wedding attire, and Gambang Kromong performances potentially contain mathematical concepts related to geometry, proportion, patterns, spatial orientation, rhythm, and symbolic representation. These cultural artifacts not only reflect traditional values but also demonstrate mathematical thinking embedded within cultural practices.

Several previous studies have explored ethnomathematics in Betawi culture. Research conducted by [Putri et al. \(2023\)](#), developed ethnomathematics teaching materials using Betawi traditional wedding attire, while [Agusta \(2021\)](#) examined geometric transformations in Betawi cultural contexts. However, these studies primarily focused on geometric motifs and the development of instructional materials, providing limited analysis of the broader mathematical activities embedded in Betawi cultural practices. Similarly, studies on Betawi wedding traditions have mostly employed semiotic approaches that emphasize symbolic meanings rather than mathematical concepts ([Parajuli & Koirala, 2025](#); [Sulistyawati & Radite, 2022](#)). Consequently, the mathematical ideas embedded in Betawi traditional wedding symbols remain underexplored, particularly when examined through Bishop's six mathematical activities. The present study addresses this gap by systematically exploring Betawi wedding symbols, including dowries, musical instruments, bridal accessories, and ceremonial arrangements, to identify the mathematical activities and concepts embedded within them and examine their potential as contexts for school mathematics learning.

Based on these gaps, this study aims to explore the ethnomathematical concepts embedded in Betawi traditional wedding symbols found in the museum and surrounding areas of the Betawi Cultural Village, Setu Babakan. The study also examines how the identified ethnomathematical concepts can be utilized as contexts for mathematics learning in schools. Accordingly, this study addresses the following research questions: (1) What mathematical concepts are embedded in Betawi traditional wedding symbols found in the museum and surrounding areas of the Betawi Cultural Village, Setu Babakan? and (2) How can the findings of the ethnomathematical exploration be utilized as contexts for mathematics learning in schools? This study is expected to contribute theoretically to the development of ethnomathematics studies in Indonesian local culture and practically to the development of culturally responsive and contextual mathematics learning. Furthermore, this research is also expected to support efforts to preserve Betawi cultural heritage through educational practices that integrate culture and mathematics meaningfully.

2. Research Methods

This study employed a qualitative approach using a case study method ([Miles et al., 2014](#); [Rosa et al., 2022](#)). The case study approach was selected because the research aimed to explore the cultural meanings, symbols, and ethnomathematical activities embedded in Betawi traditional wedding practices. This approach enabled the researcher to gain an in-depth understanding of the Betawi community's cultural practices through field observations, interviews, and documentation.

The research was conducted at the Setu Babakan Betawi Cultural Village in South Jakarta. This location was chosen for its rich cultural resources, including the Betawi Cultural Museum, local settlements, and Betawi-based businesses such as *Roti Buaya* craftsmen, which support a comprehensive exploration of ongoing cultural practices ([Sari et al., 2022](#)). The study took place from January to March 2026.

Participants in this study were Betawi cultural figures and practitioners with extensive knowledge and experience in Betawi traditional wedding customs. They were selected using purposive sampling based on their involvement, expertise, and understanding of cultural symbols and ceremonial practices ([Sugiyono, 2017](#)). The participants included traditional leaders, elders, cultural practitioners, and business owners associated with Betawi wedding traditions. Details of participants are shown in [Table 1](#).

Table 1. Research Participant

Informant Code	Classification	Background/Role
Informant A	Cultural Figure	Betawi Traditional Leader (Betawi Cultural Institution)
Informant B	Cultural Figure	Traditional Elder of Betawi Cultural Village
Informant C	Cultural Practitioner	Music Practitioner and Betawi Museum Guide
Informant D	Cultural Practitioner	Owner of Roti Buaya Business
Informant E	Cultural Practitioner	Owner of Roti Buaya Business

The five participants were considered sufficient because they were selected purposively based on their direct involvement, experience, and knowledge of Betawi wedding traditions. The participants represented complementary perspectives from cultural leaders, traditional elders, and cultural practitioners involved in Betawi cultural preservation, traditional music, and the production of wedding-related cultural artifacts. Their diverse backgrounds enabled the study to obtain comprehensive information about the cultural meanings, practices, and material forms of Betawi wedding symbols. Data collection continued until the information obtained from the participants was considered sufficient to address the research questions and identify the ethnomathematical concepts embedded in the studied symbols.

Data were collected through observation, interviews, and documentation. Observations were conducted directly on cultural symbols, objects, and traditional Betawi wedding practices, including *Tenong*, *Roti Buaya*, *Peti Sie*, wedding attire, and *Gambang Kromong* music. The observations aimed to identify forms, patterns, functions, and cultural activities related to mathematical concepts (Cresswell & Cresswell, 2018). Semi-structured interviews were conducted with cultural figures and practitioners to gather information on symbolic meanings, cultural philosophies, object construction processes, and traditional rules within Betawi wedding customs. All interviews were recorded to facilitate transcription and analysis. Documentation included photographs, interview recordings, field notes, and other supporting materials to strengthen data validity and provide visual evidence of ethnomathematical activities. The primary instrument was the researcher as a human instrument. Supporting instruments included interview guides, observation sheets, audio recorders, cameras, and field notes used during data collection. The validity of these instruments was ensured through triangulation and peer debriefing (Moleong, 2018).

Data analysis followed the interactive model by Miles et al. (2014), which involves data reduction, data display, and conclusion drawing. Transcribed data from interviews, observations, and documentation were classified according to Bishop's six fundamental mathematical activities: counting, measuring, designing, playing, explaining, and locating (Bishop, 1985). NVivo 12 software was used to assist with coding and organizing data, with coding criteria aligned with the indicators for these six activities (see Table 2). The analysis focused on identifying relationships between Betawi wedding symbols and the mathematical concepts embedded in ethnomathematical activities.

Table 2. Indicator of Six Fundamental Mathematical Activities

Type of Activity	Analytical Focus
Designing	Shapes, patterns, symmetry, and visual design of cultural objects
Measuring	Dimensions, size, weight, volume, and proportional comparison
Playing	Rules, strategies, interactions, and cultural game structures
Counting	Numbers, quantity, sequences, and calculation systems
Explaining	Logical reasoning, cause-and-effect relationships, and symbolic philosophy
Locating	Spatial orientation, position, and spatial relationships

To ensure the trustworthiness of the findings, this study employed methodological triangulation, peer debriefing, and thick description. Triangulation was conducted by comparing data obtained from observations, interviews, and documentation to verify the consistency of the findings. Peer debriefing involved discussions with mathematics education researchers to review the coding process and interpretation of the data. Thick description was applied by providing detailed accounts of the cultural context, participants, and research procedures, enabling readers to assess the transferability of the findings. These strategies were used to enhance the accuracy, credibility, and reliability of the research findings ([Bishop, 1985](#)).

The research procedure comprised interconnected stages. Initially, a literature review was conducted, research problems were identified, instruments were prepared, and research locations and participants were determined. Bishop's ethnomathematics theory was reviewed as the primary analytical framework. Data collection followed, involving observation, interviews, and documentation focused on symbols and cultural practices in Betawi traditional weddings. Observations targeted mathematical activities embedded in cultural objects and traditions, while interviews explored informants' meanings, philosophies, and cultural interpretations.

Subsequently, the interview data were transcribed, while field notes and documentation records were organized for analysis. Initial codes were generated inductively by identifying recurring words, phrases, actions, and descriptions related to mathematical ideas and cultural practices in the data. These initial codes were then categorized deductively based on Bishop's six fundamental mathematical activities: counting, measuring, locating, designing, playing, and explaining. Within each category, the coded data were further examined to identify specific mathematical concepts and their cultural meanings embedded in Betawi wedding symbols and practices. To ensure coding consistency, a coding framework was developed based on the operational definitions of Bishop's six activities, and the coded data were reviewed iteratively by comparing the codes with the original interview transcripts, field notes, and documentation. NVivo 12 was used to organize the data, manage the coding process, and facilitate systematic comparison across data sources. Finally, the findings were interpreted, conclusions were drawn, and the research report was prepared to synthesize the relationship between cultural practices and mathematical concepts, constructing an ethnomathematical understanding of Betawi traditional wedding symbols and practices.

3 Results and Discussions

These results provide a foundation for a broader ethnomathematical interpretation, in which the following subsection explores the presence of [Bishop \(1985\)](#) six mathematical activities across the various symbols of Betawi wedding traditions.

3.1 Counting Activities

Counting activities in Betawi wedding traditions are reflected in the structured arrangement of *Tenong* containers. Each side of *Tenong* consists of twelve tiers, totaling twenty-four containers, where the number twelve symbolizes the balance between day and night. This numerical structure integrates counting with cultural and religious symbolism, demonstrating how numbers and quantitative relationships are embedded in local cultural practices as shows in [Figure 1](#).

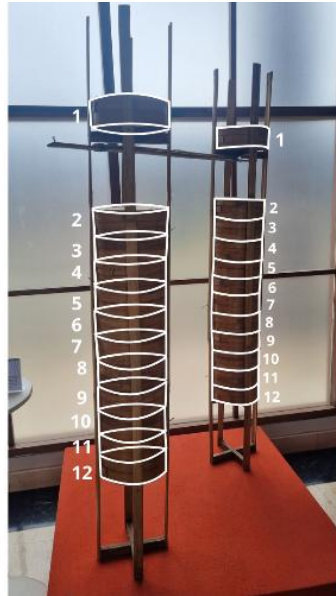


Figure 1. Number of *Tenong* Arrangements

Overall, counting activities in Betawi wedding traditions demonstrates that numerical concepts are not only used for quantification but also for conveying cultural and religious meanings. These findings align with the ethnomathematics perspective, where mathematical ideas such as numbers, patterns, and quantitative relationships are embedded in cultural practices. Therefore, counting in this context reflects the integration of mathematical thinking with local cultural knowledge, reinforcing the relevance of ethnomathematics in understanding mathematics as a human activity.

3.2 Measuring Activities

Measuring activities are evident in the making of crocodile bread which is usually referred to as “*Roti Buaya*”, a symbolic bread shaped like a saltwater crocodile. Although the real crocodile can reach 5 – 7 *meters* in length, the *Roti Buaya* is scaled down to approximately 30 *cm* or up to 1 *meter*, with flexible variations depending on needs and production capacity. Mathematically, when a crocodile of approximately 5 *meters* is represented by a bread figure measuring 1 *meter*, a reduction in size occurs with a proportional comparison of approximately are presented in **Equation 1**.

$$Scale = \frac{1 \text{ meter}}{5 \text{ meters}} = 1 : 5 \quad (1)$$

If a smaller version of 30 *cm* (0.3 *meters*) is made, then it shows in **Equation 2**.

$$\frac{0.3}{5} = 0.06 \approx 1 : 16 \quad (2)$$

However, for the bread maker, this process is not understood as a formal mathematical formula, but rather as a practical consideration.

In addition to length, the production of *Roti Buaya* also involves measuring weight and maintaining proportionality between its parts. A pair of *Roti Buaya* of about 1 *meter* typically uses 1 *kg* of dough, while smaller versions of around 30 *cm* use approximately 100 *grams*, indicating consistent use of informal measurement units. Mathematically, if a 1-meter (100 *cm*) bread requires 1000 *grams* of dough, then for a 30 *cm* bread the ratio of lengths as shows in **Equation 3**.

$$\frac{30 \text{ cm}}{100 \text{ cm}} = 0.3 \text{ cm} \quad (3)$$

Meanwhile, the ratio of the dough weight used as shows in **Equation 4**.

$$\frac{100 \text{ grams}}{1000 \text{ grams}} = 0.1 \text{ grams} \quad (4)$$

This proportional comparison between the original object and its representation demonstrates the application of ratio and scale, as shown in [Figure 2a](#) and [Figure 2b](#).



(a)



(b)

Figure 2. Comparison of *Roti Buaya* 50 cm (a) and Saltwater Crocodile 4.5 m (b)

In general, the measuring activities within Betawi wedding traditions illustrate the application of estimation, balance, and proportional reasoning in cultural practices. These results correspond with ethnomathematics principles, where measurement, units, and scale are inherently part of everyday cultural activities. Thus, measuring in this context exemplifies how mathematical concepts evolve through hands-on experience and cultural significance.

3.3 Designing Activities

Designing activities manifest in cultural artifacts such as *Peti Sie*, which is constructed as a geometric container combining functional and aesthetic considerations. It is modeled as a composite solid combining a rectangular prism and a triangular prism, reflecting spatial reasoning and geometric construction, and supported by four legs to maintain stability. From a mathematical perspective, the form of *Peti Sie* can be modeled as a combination of three-dimensional shapes. The integration of a rectangular prism and a prism creates a unified structure that represents spatial reasoning and geometric construction. This modeling process is illustrated in [Figure 3a](#) and [Figure 3b](#).



(a)



(b)

Figure 3. *Peti Sie* (a), Geometric Tracing of *Peti Sie* (b)

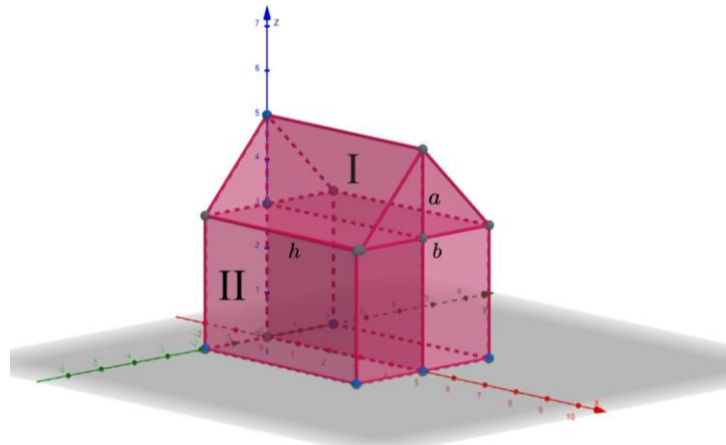


Figure 4. Mathematics Modelling of Composite Solid with *GeoGebra* Assistance

Formulas of the Volume Composite Solid Figure of Triangular Prism and Rectangular Prism.

Plane Figure I: Triangular Prism

Plane Figure II: Rectangular Prism

The Formula of Volume Plane Figure I as shows in **Equation 5**.

$$V = \frac{1}{2}bah \quad (5)$$

The Formula of Volume Plane Figure II as shows in **Equation 6**.

$$V = l \times w \times h \quad (6)$$

Suppose, A is Volume Composite Solid Figure of Triangular Prism and Rectangular Prism.

$$A = \text{Volume Solid Figure I} + \text{Volume Solid Figure II} \quad (7)$$

$$A = \left(\frac{1}{2}bah\right) + (l \times w \times h) \quad (8)$$

Designing activity is also reflected in the Betawi bride's attire, Care None Cine, which is composed of multiple elements arranged in a balanced structure. Components such as *Siangko*, *kembang goyang*, and *burung hong* are systematically organized to create visual harmony across the body. The ornaments on the bride's head also demonstrate geometric transformation, particularly reflection. The symmetrical arrangement between the left and right sides creates a mirrored structure that reflects balance and visual harmony. This concept of reflection is illustrated in [Figures 5a](#) and [Figure 5b](#).



(a)



(b)

Figure 5. *Siangko* Before (a) and After Reflected Across the y-axis (b)

The formula of reflected across the y-axis as shows in **Equation 9**.

$$P(x, y) \rightarrow P'(-x, y) \quad (9)$$

Overall, the designing activities identified in Betawi wedding traditions demonstrate how geometric concepts, such as shape, symmetry, proportion, and transformation, are embedded in cultural artifacts. These findings support previous ethnomathematics studies showing that geometric ideas can emerge naturally from cultural practices and visual designs, even when the practitioners do not explicitly frame their activities in formal mathematical terms. However, this study extends previous findings by demonstrating that such mathematical ideas are not only present in the visual forms of Betawi wedding artifacts but are also closely connected to their cultural functions and symbolic meanings. The findings therefore provide new insight into how the designing activity reflects the interplay between mathematical reasoning, creativity, functionality, and cultural symbolism in Betawi wedding traditions. This perspective reinforces the potential of cultural artifacts to serve as meaningful contexts for connecting geometric concepts with students' understanding of mathematics.

3.4 Playing Activities

Playing activities in Betawi wedding traditions appear in the performance of *Gambang Kromong music*, where coordination and role distribution among players follow structured rules. Each instrument is played by a different individual, forming a structured system where every component contributes to the overall harmony. This organized interaction among instruments illustrates the application of rules and collaborative play, as shown in [Figure 6](#).

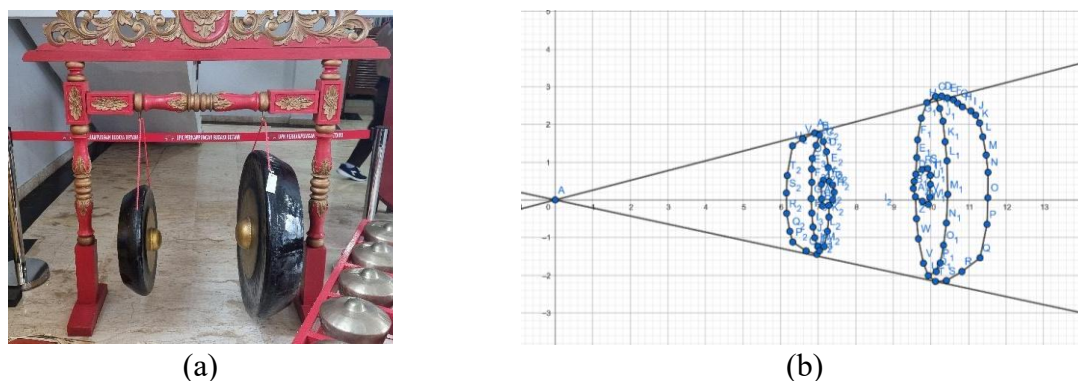


Figure 6. Gong and Kempul (a), Geometric Dilation of Gong and Kempul (b)

The formula of dilation between *gong* and *kempul* when dilation about the center of $O(0,0)$ as shows in **Equation 10**, when dilation about the center of $A(a, b)$ as shows in **Equation 11**.

$$P(x, y) \rightarrow P(kx, ky) \quad (10)$$

$$P(x, y) \rightarrow P(k(x - a), k(y - b)) \quad (11)$$

The rhythmic pattern in *Gambang Kromong* also demonstrates structured repetition and cyclical rules. The sound pattern “*pul, pul, gong*” indicates that the *gong* sound appears every third beat, forming a repeating rhythmic cycle that reflects periodic sequences in mathematical thinking, as presented in [Figure 7](#).



Figure 7. *Gendang* in *Gambang Keromong*

The *Gendang* drum demonstrates spatial variation in pitch depending on where the membrane is struck, indicating implicit understanding of spatial properties on a circular surface, as shown in [Figure 7](#).

3.5 Explaining Activities

Explaining activity in Betawi wedding traditions is reflected in the symbolic meaning of *Roti Buaya*, which represents loyalty and continuity of life. The community explains this symbol through the belief that crocodiles are faithful animals and through philosophical reasoning linking marriage to balance and sustainability of generations. This logical and symbolic interpretation of cultural meaning can be observed in [Figure 8](#).



Figure 8. *Roti Buaya*

Explaining activity is also evident in the meaning of *Tenong*, which symbolizes balance in household life. The number of twelve tiers is interpreted as representing twelve hours of day and twelve hours of night, illustrating equilibrium in human life. This reasoning demonstrates how numerical structure is explained through philosophical meaning, as presented in [Figure 9](#).

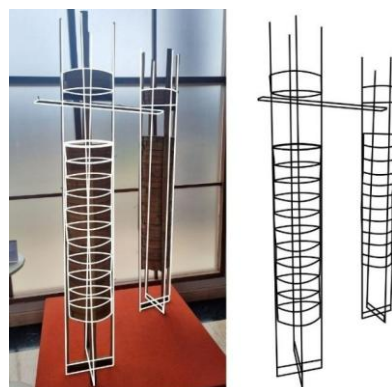


Figure 9. Structure of *Tenong* Containers

Explaining activity is further reflected in the symbolism of *Peti Sie*, which represents security and fulfillment of basic needs in marriage. The presence of raw food ingredients inside the container is explained as a guarantee that the couple's livelihood has been prepared. This connection between concrete objects and abstract meaning can be seen in [Figure 10](#).



Figure 10. Front (a) and Side View of *Peti Sie* (b)

Explaining activity is also found in the Betawi bridal attire, where each element carries philosophical and cultural meaning. Accessories such as *kembang goyang*, Hong Bird, and *Siangko* are explained through symbolic interpretations related to time, protection, and blessings. This integration of aesthetic design and symbolic reasoning is illustrated in [Figure 11](#).



Figure 11. *Siangko* on the Bride

In addition, the groom's attire (*Care Haji*) also reflects explaining activity through its representation of religious identity and social meaning. The structure and ornaments of the clothing are interpreted as symbols of dignity, harmony, and cultural values. This explanation of symbolic meaning can be observed in [Figure 12](#).



Figure 12. *Care Haji* Attire

Overall, explaining activity in Betawi wedding traditions demonstrates how cultural practices are understood through logical and symbolic reasoning. The meanings attached to objects and rituals reflect connections between observable forms and abstract values. Therefore, this activity aligns with ethnomathematics, where reasoning and explanation play a role in interpreting mathematical ideas embedded in cultural contexts.

3.6 Locating Activities

The activity of locating in Betawi traditional weddings relates to the community's ability to recognize and distinguish cultural practices based on geographical regions, such as Central Betawi and Outer Betawi. Differences in the types of offerings, such as *Roti Buaya* and *Pisang Raja* in Central Betawi and *Sirih Lamaran* and dried *gabus* fish in Outer Betawi, indicate a strong relationship between cultural practices, spatial context, and environmental conditions. Thus, this practice reflects mathematical concepts of location and mapping that can be visualized through the distribution of cultural regions as shown in [Figure 13](#).

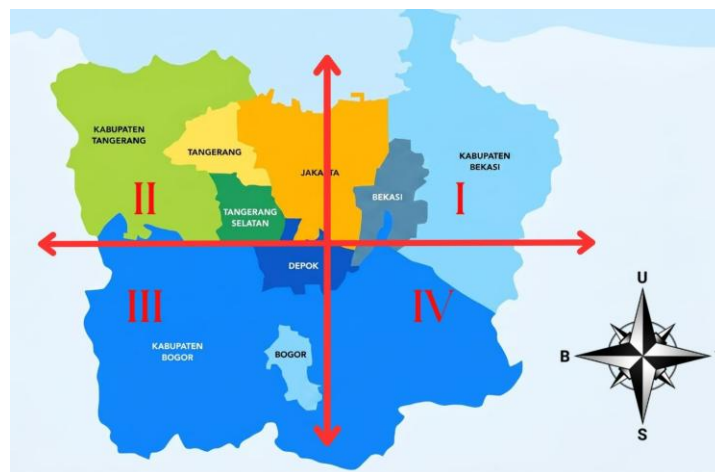


Figure 13. Map of Jakarta and Surrounding Areas

Based on the division of the region using the Cartesian coordinate system shown in the image, the surrounding areas of Jakarta can be analyzed according to their relative positions with respect to the horizontal axis (x -axis) and vertical axis (y -axis), which intersect at a central reference point. In Quadrant I (upper right), the regions included are Bekasi Regency and Bekasi. Mathematically, this quadrant represents areas with coordinates $x > 0$ and $y > 0$ indicating that they are located to the east and north of the origin. In Quadrant II (upper left), the regions consist of Tangerang Regency, Tangerang, Tangerang Selatan, Jakarta. These areas correspond to coordinates where $x < 0$ and $y > 0$, meaning they are situated to the west and north of the central point. Quadrant III (lower left) is occupied by Bogor Regency, which is characterized by $x < 0$ and $y < 0$, indicating a position to the south and west of the origin. Meanwhile, Quadrant IV (lower right) includes Depok and Bogor, representing regions with $x > 0$ and $y < 0$, or areas located to the east and south of the center.

From this explanation, the locating activity demonstrates that cultural practices are strongly linked to spatial context and geographic distribution, which affect the shapes and types of symbols found in Betawi wedding traditions. This activity involves mathematical ideas such as coordinates, mapping, and classification that illustrate the relationships between different locations within a spatial framework. Consequently, locating activities strengthen the relationship between ethnomathematics and spatial reasoning in the Betawi community.

4 Conclusion

Based on the analysis of Betawi traditional wedding symbols in Setu Babakan, this study concludes that mathematical ideas are deeply embedded in cultural artifacts and practices through Bishop's six fundamental activities: counting, measuring, designing, playing, explaining, and locating. These activities reveal implicit concepts such as number, ratio, scale, symmetry, transformation, periodicity, spatial orientation, and logical reasoning that naturally arise from community practices rather than formal instruction. The findings affirm that mathematics functions as a cultural product and that Betawi wedding traditions provide rich, authentic contexts for school mathematics, particularly related to solid geometry, transformation, comparison, and coordinate systems at junior and senior high school levels.

However, this study also has several limitations that need to be acknowledged. The research was conducted as a single case study in one cultural setting in Setu Babakan, Jakarta, with a limited number of cultural figures and practitioners as participants, so the results may not fully represent the diversity of Betawi wedding practices in other regions. The data relied mainly on observations, interviews, and documentation at a specific time period, which means that changes in ritual practice or symbol use over time could not be systematically captured. In addition, the study focused on identifying and interpreting mathematical activities and did not empirically test the effectiveness of these cultural contexts when implemented in classroom learning, so pedagogical impacts remain to be explored.

In light of these limitations, several recommendations for future research can be proposed. Subsequent studies could expand the scope to include other Betawi communities and compare variations in wedding symbols and mathematical activities across Central and Outer Betawi regions, or even across different ethnic wedding traditions in Indonesia. Future research may also develop and test culture-based mathematics learning designs that explicitly use Betawi wedding symbols as teaching contexts, examining their influence on students' conceptual understanding, attitudes, and cultural identity. For mathematics teachers, the findings provide practical opportunities to integrate Betawi cultural contexts into classroom instruction. For example, *Peti Sie* can be used to introduce solid geometry by asking students to identify and calculate the volume or surface area of its component shapes; *Siangko* can be used to explore geometric reflection by analyzing the symmetry of its motifs; and *Roti Buaya* can be used to teach ratio, proportion, and scale through comparisons of its size and dimensions. Such activities can encourage students to connect formal mathematical concepts with authentic cultural objects while developing appreciation for local cultural heritage. Moreover, interdisciplinary collaborations involving mathematics education, anthropology, and art or music studies could deepen the analysis of symbolism, material culture, and performance aspects, thereby enriching ethnomathematical interpretation and its pedagogical applications.

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