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The Ethnomathematics of the Orem Sasadu Sahu Tribe: Reconstructing Mathematical Concepts from Cultural Activities

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ABSTRACT (9 pt)

Objective: This research examines the process of constructing mathematical concepts, which is very interesting and important. The principles of mathematical constructivism are closely linked to information processing theory in constructing concepts and reconstructing new information. This research aims to determine how mathematical reconstruction occurs in a theoretical and practical study of the fundamental activities of the Orem Sasadu Sahu Tribe on Halmahera Island. **Method:** This research is a qualitative research with an ethnographic approach. The data analysis used is the methodical elements, namely description, interpretation, historical continuity, and heuristic. Furthermore, data acquisition is by field study methods, exploration, observation, interviews and documentation. In this study, the focus is on fundamental activities (1) determining time, (2) calculation, (3) counting, and (4) measuring. The data analysis technique used is a qualitative data analysis technique.

Results: This research obtained the results that (1) The construction of mathematical thinking is the activity of measuring to determine the amount of wood needed which is connected to the concept of geometry. (2) The construction of mathematical thinking is the activity of calculating and measuring to determine the amount of wood needed which is connected to the concept of natural number operations patterned like rows and series in mathematics; (3) The construction of mathematical thinking is the activity of determining how long the material must be cut, how long the renovation must take and the length of time. **Novelty:** The study of mathematical thinking constructs in Orem Sasadu activities is unique and interesting to examine. These constructs yielded three findings: measuring, calculating, and determining time.

INTRODUCTION

This research examines the process of constructing mathematical concepts, which is very interesting and important. Much research on mathematical thinking has been conducted, but many issues remain unresolved. This study presents mathematical thinking from a practical perspective, namely the reconstruction of mathematical thinking in a theoretical and practical study of the fundamental construction activities of Orem Sasadu in the Sahu Tribe on Halmahera Island. The principles of mathematical constructivism are closely linked to information processing theory in constructing concepts and reconstructing new information. Research on the construction of mathematical thinking is very important to be studied, namely (1) The construction of mathematical thinking is linked to ethnomathematics, which is rarely done, this is important in research on mathematics education as a relationship between mathematics and culture; (2) Mathematics is a subject that is considered difficult for students, therefore if mathematics is linked to culture, especially local culture, then this is something that is interesting for students; (3) Learning projects are one of the things that attract students' interest when studying in the classroom, teachers can give an example that mathematics



is closely related to culture, namely ethnomathematics, so it can construct students' mathematical thinking (4) ethnomathematics can improve mathematical construction through culture by building non-standard mathematical concepts used in everyday life with standard measurements contained in mathematical concepts, so this research aims to determine how mathematical reconstruction occurs in a theoretical and practical study of the fundamental activities of the Orem Sasadu Sahu Tribe on Halmahera Island. The construction of mathematical thinking is an interesting area of research. It is an in-depth study of students' mathematical problem-solving (Hery Suharna et al., 2025) (Hery Suharna & Alhaddad, 2018). Research on the construction of mathematical thinking examines students' mathematical thinking when working on problems. Students' work involves constructing a thought process for solving mathematical problems, which is then concretely visualized in the form of images (Dr. Hery Suharna, 2018) (Hidayati et al., 2024). One hotly discussed topic in mathematics learning is integrating mathematics with the surrounding cultural context. Research on the process of reconstructing mathematical concepts is both interesting and important. The principles of mathematical constructing thinking are closely intertwined with information processing theory in constructing concepts and reconstructing concepts to acquire new information (Huang et al., 2025) (Jalilov et al., 2025) (Atmojo et al., 2025) (Al-shumrani, 2025). This research aims to determine how mathematical constructing thinking is incorporated into theoretical and practical studies of the fundamental activities of the Orem Sasadu, a tribe of the Sahu people of Halmahera Island. Ethnomathematics is the exploration of mathematics in the context of community life, particularly culture. Mathematics is a part of culture and is universal, and concrete ethnomathematic objects can support and assist students in understanding abstract mathematics. Therefore, culturally based mathematics learning will be more engaging, enabling students to be more active and creative in exploring their findings (Sadykova et al., 2025) (Huang et al., 2025) (Fitrah et al., 2025) (Ryskul et al., 2025). This study describes how the mathematical thinking reconstruction of measuring activities to determine the amount of wood needed is connected to geometric concepts. It also describes how the mathematical thinking reconstruction of counting and measuring activities to determine the amount of wood needed is connected to the concept of natural number operations with patterns such as sequences and series in mathematics (Shalbayeva, 2025) (Nikolaevna et al., 2024) (Syukriyah et al., 2025). It also describes the mathematical thinking reconstruction of activities to determine the time required to cut materials, the time required to renovate, and the duration of the Orem Sasadu renovation. This is crucial as a manifestation of the development of qualitative research (Samsudin et al., 2025) (Vebibina et al., 2025) (Puspitoningrum et al., 2024) (Imron et al., 2024) (Atmojo et al., 2025) (Sadykova et al., 2025). Students' mathematics learning is usually seen as the results of their work without observing the process (Rakhman et al., 2025) (Mustainah & Haryono, 2025) (Maxmudova et al., 2025). Constructive thinking examines students'



thought processes when solving mathematical problems (Maxmudova et al., 2025) (Al-mamari et al., 2025) (Maxmudova et al., 2025). Collaboration and combination in problem-solving and research are crucial. Therefore, this study examines how practical mathematics is studied in the fundamental construction activities of the Orem Sasadu Sahu Tribe on Halmahera Island.

RESEARCH METHOD

The type of research in this study is a qualitative research with an ethnographic approach. Methodical elements (description, interpretation, historical continuity, and heuristics). Description, namely at this stage the researcher explains or describes the facts about the relationship of Orem Sasadu culture with mathematical concepts, so that it can be described how the construction of mathematical thinking exists in Orem Sasadu. Interviews, observations, observations that have been collected objectively and in detail. The focus is to present a clear picture of what, who, when, where, and how an event occurs, based on available data, so that readers can understand it as if experiencing it themselves. Historical continuity refers to the concept that Orem Sasadu events how it was built, when it was built, etc. occur interrelated and continuous in the timeline. This is what emphasizes the development or growth from one event to the next. Heuristics, namely the initial stage in Orem Sasadu research that involves searching and collecting sources or data about Orem Sasadu that are relevant, namely the construction of mathematical thinking. This includes the collection and compilation of various types of sources, both primary and secondary, such as written documents, artifacts, oral recordings, or other relics. The goal is to inventory as much data as possible related to the past events being studied. The research subjects were at least two traditional figures to obtain information related to Orem Sasadu. Data collection techniques used field studies, exploration, observation, interviews, and documentation. In this study, the focus was on counting activities.

The subjects in the research on mathematical thinking construction in Orem Sasadu activities are presented in Table 1 below.

Table 1. Research Subjects

No	Data retrieval	Data source	Data acquisition
1.	Interview	1 Religious Leader 1 Traditional House Manager 1 Worat-worat Village Head	Transcribed recording data
2.	Documentation	Documentation of images taken during fieldwork	Documents in the form of photos and recordings
3.	Observation	Results in the form of notes	Field notes

Data obtained from interviews, field notes, and documentation were reduced by selecting the necessary information to obtain valid data (Suharna). The validity of the research data was carried out using triangulation methods, namely data interviews, field



studies, and documentation, which were compared to see the consistency of the research data. Data analysis techniques included data reduction, data presentation, and drawing conclusions. Data reduction was used to sharpen, classify, and discard data that was not needed in the research.

Data obtained from interviews, field notes, and documentation were reduced by selecting the necessary information to obtain valid data (Dr. Hery Suharna, 2018) (Hery Suharna et al., 2024) (H Suharna et al., 2020). The validity of the research data was assessed using triangulation methods, namely interview data, field studies, and documentation, which were compared to see the consistency of the research data. Data analysis techniques included data reduction, data presentation, and drawing conclusions. Data reduction was used to sharpen, classify, and discard unnecessary data in the study (Alebous, 2025) (Eidhah & Shamlan, 2025) (Fitrah et al., 2025) (Shalbayeva, 2025).

The steps of research data analysis according to Creswell (2010:276) are: (1) Processing and preparing data for analysis. This step involves transcribing think aloud data, interviews, scanning materials, recording field data or sorting and organizing the data into different types depending on the source of information; (2) Reading the entire data. Building a generalization from the information obtained and reflecting on its overall meaning. What is the idea? What is the impression of depth and credibility? At this stage the researcher writes specific notes or general ideas about the data obtained; (3) Analyzing in more detail by coding the data. This step includes several stages: taking written data or images that have been collected, segmenting sentences or images of these sentences into categories, then labeling these categories with special terms; (4) Applying the coding process to describe the categories and themes to be analyzed; (5) Describing and these themes will be presented again in a qualitative narrative/report; and (5) Interpreting or giving meaning to the data. Researchers confirm whether the research results confirm or refute previous information. Interpretation/meaning also takes the form of new questions that need to be answered next: questions that arise from the data and analysis.

Data triangulation can be done based on transcript documents from interviews, observations, and surveys. Research on the construction of thinking in the activities of Rumah Sasadu is a triangulation method, namely data that uses various data collection methods to test the accuracy of the data, such as a combination of interviews, observations, and surveys. Validasi hasal berdasarkan data yang diperoleh peneliti bahwa pengambilan data pertama dan kedua harus konsisten. Suatu data yang valid berdasarkan konsistensi data dengan demikian data adalah valid. Dapat disimpulkan bahwa data tersebut dapat digunakan dan valid.

RESULTS AND DISCUSSION

Results



This section discusses the data collection and results of the mathematical thinking reconstruction research on the Sasadu orem. Data collection was conducted twice at different times. The research data obtained are presented in Table 2.

Table 2. Research data acquisition

No	Data indicators	Data retrieval	Data acquisition
1.	Fundamental activity measures on Orem Sasadu construction	Interviews, field notes and documentation	- 2 data collection - Data triangulation - Valid data
2.	Fundamental activity of calculating in Orem Sasadu construction	Interviews, field notes and documentation	- 2 data collection - Data triangulation - Valid data
3.	Fundamental activities determine the time in the construction of Orem Sasadu	Interviews, field notes and documentation	- 2 data collection - Data triangulation - Valid data

Validation results: Based on the data obtained by the researcher, the first and second data collection were consistent, thus the data is valid. It can be concluded that the data is usable and valid.

Based on the data obtained, the results of the research on fundamental activities of measuring, calculating and determining time are then obtained, with the following partial discussion.

1. The fundamental activity of measuring the Orem Sasadu construction is the connection with the concept of geometry.

The mathematical construction of the Sasadu house measurement activity can be seen based on interviews and observations. The construction begins with measuring the roof rafters. Mathematically, this activity is a geometric activity, namely how the rafters are a combination of triangles and quadrilaterals, as seen in Figure 3 and 4. The combination of triangles consists of two triangular planes on the upper roof, two quadrilaterals, two squares, and two triangles at the bottom. The construction considerations of traditional leaders represent a thought structure formed based on their mathematical reasoning. This is practical mathematics often found in community social activities.

Mathematically, the thought process of combining two triangular planes on the upper roof, two quadrilaterals, two squares, and two triangles at the bottom is a geometric concept. The geometric thought process is a mathematical construct. This mathematical construction, mathematically, is a fundamental construction of geometric measurement activities. This can be seen from the results of interviews between the researcher and the information source, namely the leader of Orem Sadu, as quoted in the following interview excerpt:



Based on the results of the interview between the researcher and the source of information, namely the figure who is the manager of Orem Sadu, with the following interview excerpt:

- P1 : Next, about the shape, there are triangles, rectangular triangles. Have you ever counted how many triangles there are? There are 4 of them. And how many roofs do these triangles have?
- S1 : *Indeed, if it's the roofs of the elders, they know how to calculate if we can fit our needs to complete them.*
- P1 : According to needs?
- S2 : *Yes, that's how it is.*
- P1 : For example, the distance between these two is the size of the other houses. I see that these traditional houses are almost the same size. Is that the agreed-upon size, or is it natural? It's just an estimate, how big were they in the past?
- S3 : *Yes, that's what we think, because it's not stated how many meters this is, but we have a measurement called a cubit.*
- P1 : How many cubits?
- S4 : *How many cubits, how many cubits, like that. It's just that at first glance, what they convey is like that, according to the story, so we might believe that it's how many meters, or it might not be a thing, because it's clear, for example, oh, this (pole) is how many meters high, exactly one, this one has to be replaced, we still have to measure 2 meters, right? So, the person assigned is the one who measures how many people are assigned, for example, that one will definitely be replaced.*

The interview excerpt above shows that the measurement process is carried out in various ways. For example, the statement "How many cubits are there?" suggests that this measurement is still used in calculating the procurement of materials for the Orem Sasadu renovation. Seating is done per group, usually by young people. The construction of mathematical thinking concepts occurs during measurements, especially in specific patterns.

Next, the interview results "*just a glimpse of what they conveyed was like that according to the story, so we can believe that how many meters may or may not be a matter, because it is clear, for example, oh this (pole) is how many meters high, exactly one, this one has to be replaced, we still have to measure 2 meters, right, so the person who was assigned was the one who measured how many people were assigned*" this is a form of reconstruction of mathematical thinking, where at this time the measurement of cubits, fathoms, etc. is still maintained. Adaptation is carried out in addition to pledging these non-standard measurements, currently as a comparison, standard measurements are used, such as meters, centimeters, etc. Next, the documentation of the real form of Orem Sasadu in Figure 1 is as follows:



Figure 1. Orem Sasadu Sahu Tribe

From Figure 1 and the researcher's observations, it can be seen that the eight pillars are arranged in a rectangular shape, with two pillars in the middle, approximately 1 meter apart, while the other pillars are further apart but symmetrical. The layout can be depicted in Figure 2 as follows.

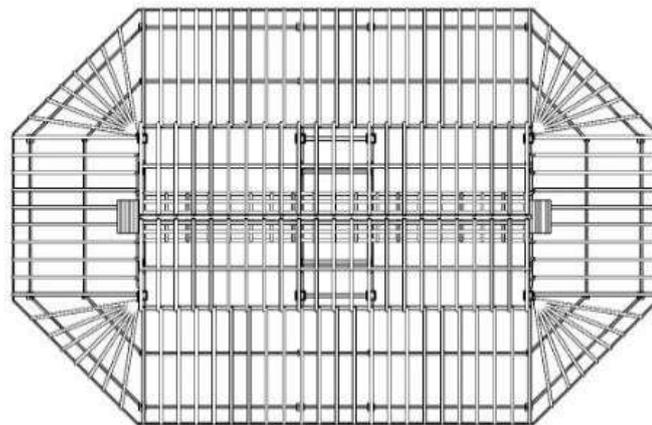


Figure 2. Geometric connection

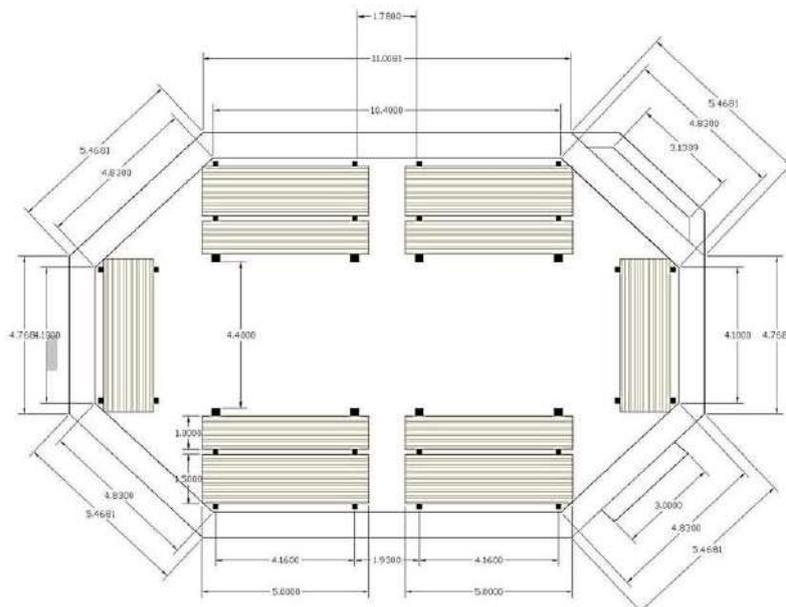




Figure 3. Geometrically, the shape in Orem Sasadu

Based on the results of the fundamental activity of measuring the Orem Sasadu construction of connections with geometric concepts, it can be constructed in mathematical thinking in the following image:

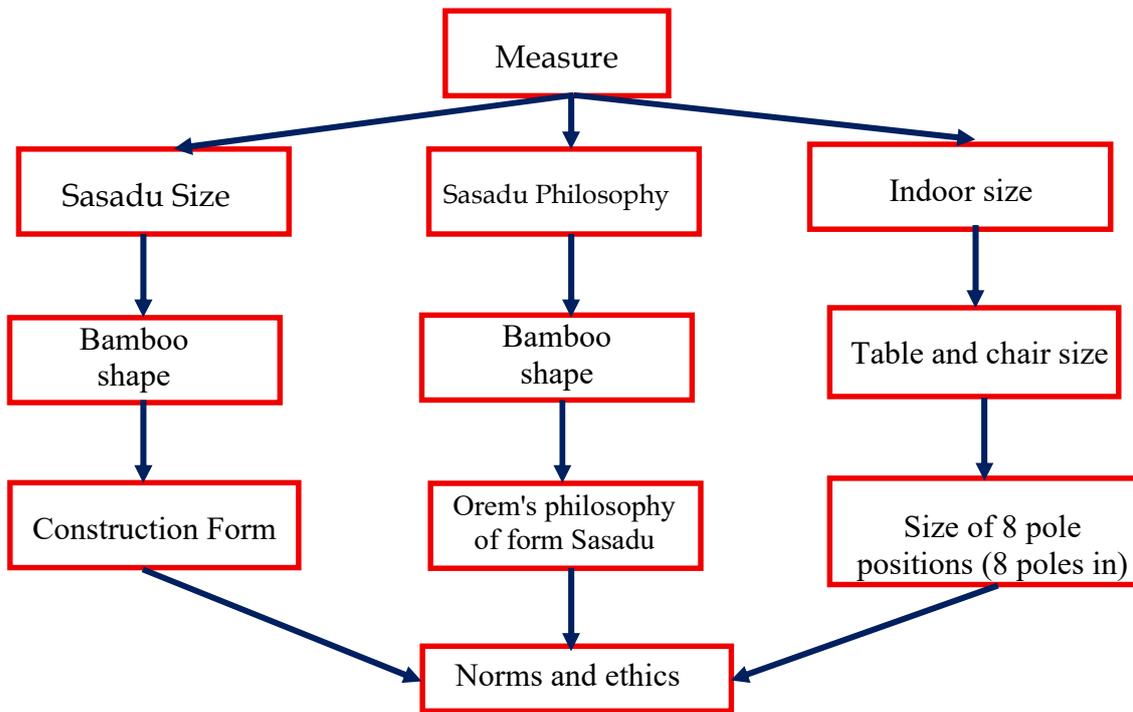


Figure 4. Construction of mathematical thinking fundamental activity measuring in Orem Sasadu construction

2. The fundamental activity of calculating on the Orem Sasadu construction connects the concept of natural number operations and patterns such as sequences and series.

The mathematical construction of the Sasadu house counting activity can be seen based on the results of interviews and observations. Construction is carried out starting from such calculations as the taking of materials for seating is done per group, usually done by the youth. Meanwhile, making the seating is usually done by the parents with the help of the youth. Group calculations are usually divided into 6 groups for each group consisting of 10 to 15 people, this can be seen as in Figures 4 and 5. The way of thinking of traditional leaders is a construction of traditional leaders is a structure of thinking formed based on the mathematical reasoning they have, this is practical mathematics that is often found in community social activities.

Mathematically, the process of selecting materials for seating is usually carried out by groups, usually by young people. Meanwhile, making seating is usually done by parents with the help of young people. The process of forming groups is usually divided into several parts, for example, 6 groups consisting of 10 to 15 people. The process of



calculating thinking is a mathematical thinking construction. This mathematical construction is mathematically a fundamental activity construction of measuring by calculating, this can be seen based on the results of interviews between researchers and information sources, namely figures who are managers of Orem Sadu with interview excerpts.

Based on the results of the interview between the researcher and the source of information, namely the figure who is the manager of Orem Sadu, with the following interview excerpt:

P1 : Can you tell us about these pillars and how many there are?

S11 : Yes, this pillar has 8 main pillars. These main pillars have been in place since 1936. Why do we have 8 main pillars? It represents togetherness and the number of customary pillars, which are 2, with each pillar being awarded 4 pillars (while pointing to the surrounding pillars).

Based on the interview excerpt above, it can be seen that there are a number of pillars, namely 8 pillars, as seen in Figure 6 below:



Figure 5. Basic form of the Orem Sasadu of the Sahu Tribe

From Figure 5 and the researchers' observations, it can be seen that the eight pillars are rectangular, with two in the center, approximately 1 meter apart, while the other pillars are spaced further apart but symmetrically. The floor plan is depicted in Figure 6 as follows:

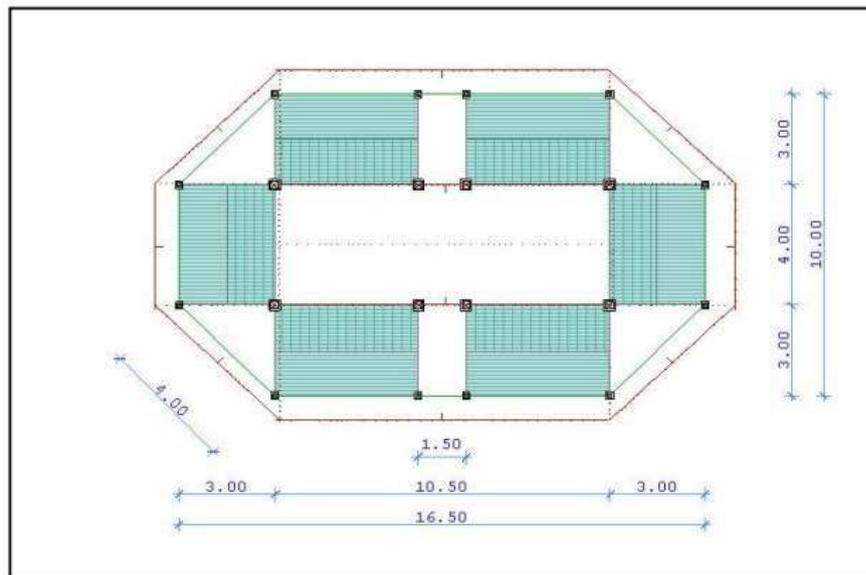


Figure 6. Geometrically, the shape in Orem Sasadu

The following is an excerpt from an interview related to the amount needed when identifying the renovation needs of Orem Sasadu.

P1 : What about the process of making other materials such as the bumbingan, seats, and others. Can you tell us about these pillars and how many there are?

S12 : Yes, the other materials are more or less the same. Like this seat (pointing to the seat next to the researcher). This seat was made by mutual cooperation, and finding the materials was also done through mutual cooperation.

The interview excerpt above shows that other calculation processes are carried out in a similar manner. For example, calculating the materials for seating is done per group, usually by the youth. Meanwhile, the seating is usually built by the parents with the assistance of the youth. Group calculations are usually divided into six groups, each consisting of 10 to 15 people. This demonstrates the mathematical concept of sets in mathematics.

P1 : That's the 3. Now this one (pointing to the orem sasadu section)... Is there a division, for example, who takes the roof, who takes the wood?

S13 : Divided.

P2 : Divided? How is the process of dividing the work groups?

S14 : Yes, it depends on the needs of the case. For example, if there are 4 or 5 groups, more than that, depending on the needs.

P1 : As for the roof, it's no longer charged.

S15 : It's no longer charged. For example, how many pieces of rope will be divided? Maybe the one I usually divide is up to 6 people, so they won't have to pay anything and will only be given one cup.

Interview excerpts from the researcher and informant statements S13 and S14 show that the calculation process was carried out when dividing groups according to needs. The mathematical concept construction in calculating the number of groups needed was



adjusted to the building's needs, and the number of groups was adjusted according to the needs. The reconstruction of the mathematical concept carried out was based on adjustments to needs at specific times and conditions.

This finding represents a form of mathematical thinking reconstruction, namely, the formation of groups is not fixed, but is adjusted according to needs. The reconstruction was carried out as an adaptation to the needs during the renovation of Orem Sasadu. The mathematical thinking construction is presented in Figure 7 below.

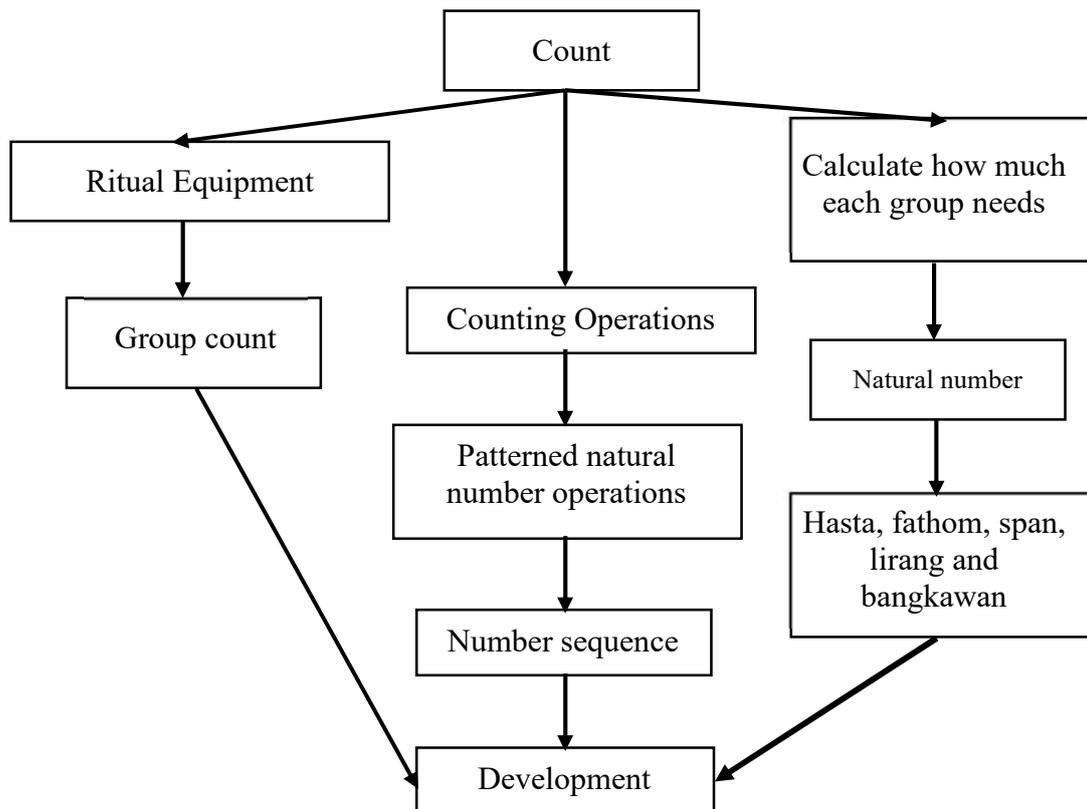


Figure 7. Mathematical thinking construction Fundamental counting activity in Orem Sasadu construction

3. Fundamental activities determine the time in the construction of Orem Sasadu. Connections determine the time for renovation and the length of time for renovation of Orem Sasadu.

Construction begins with the community's determination of the time, which is every three years. The time is determined based on an agreement and has been passed down through generations, with the renovation of the gofara (roof) occurring every three years, while also performing rituals or thanksgiving. The mathematical concept used is to determine the time for the gofara renovation. The way of thinking of traditional leaders is a structured construct of thinking formed based on mathematical reasoning, especially in determining the time for the bamboo section renovation. Conceptually, determining



this time includes the concepts of rows and sequences. Mathematically, the process of selecting materials for seating is carried out in groups, usually by young people. Meanwhile, making the seating is usually done by the elders with the help of young people. This mathematical construction is a fundamental activity of measuring by determining time. These results are based on interviews between researchers and information sources, namely figures who are managers of Orem Sadu, with the following interview.

Based on the results of the interview between the researcher and the source of information, namely the figure who is the manager of Orem Sadu, with the following interview excerpt:

P1 : How long does it take to renovate Orem Sasadu?

S15 : *So, according to our traditional custom, for a complete roof renovation, it takes three years.*

P1 : Three years.

S16 : *But every year, you can see what really needs to be replaced, but if it's not necessary, then...*

P1 : No need.

S17 : *Judging from the condition, the roof is already there. So, in general, it takes three years, the total from the gofara (roof) above, the kase year down. So, it will be the next year when it's time for renovations.*

Interview excerpts from researchers and informants S15, S16, and S17 show that the process of determining the time was carried out when making plans to carry out the renovation of Orem Sasadu. The construction of mathematical concepts in determining the time can be seen from the interview excerpt "*Judging from the condition, the roof is already. So in general, it is 3 years in total from the gofara term gofara (roof) above tuhun kase down. So later next year when he is at the time for renovation*". The time is determined based on an agreement and has been carried out for generations that the renovation of the gofara (roof) is carried out every 3 years, while also carrying out rituals or thanksgiving. The reconstruction of the mathematical concept carried out is to determine the time for the renovation of the gofara.

Documentation of the Sasadu Gofara house as an object in the Orem Sasadu renovation within a period of 3 years is as follows.



Figure 8. Gofar Oram Sasadu

Based on the data and analysis presented above, the mathematical thinking of the fundamental activity of determining time in the Orem Sasadu construction can be constructed as follows:

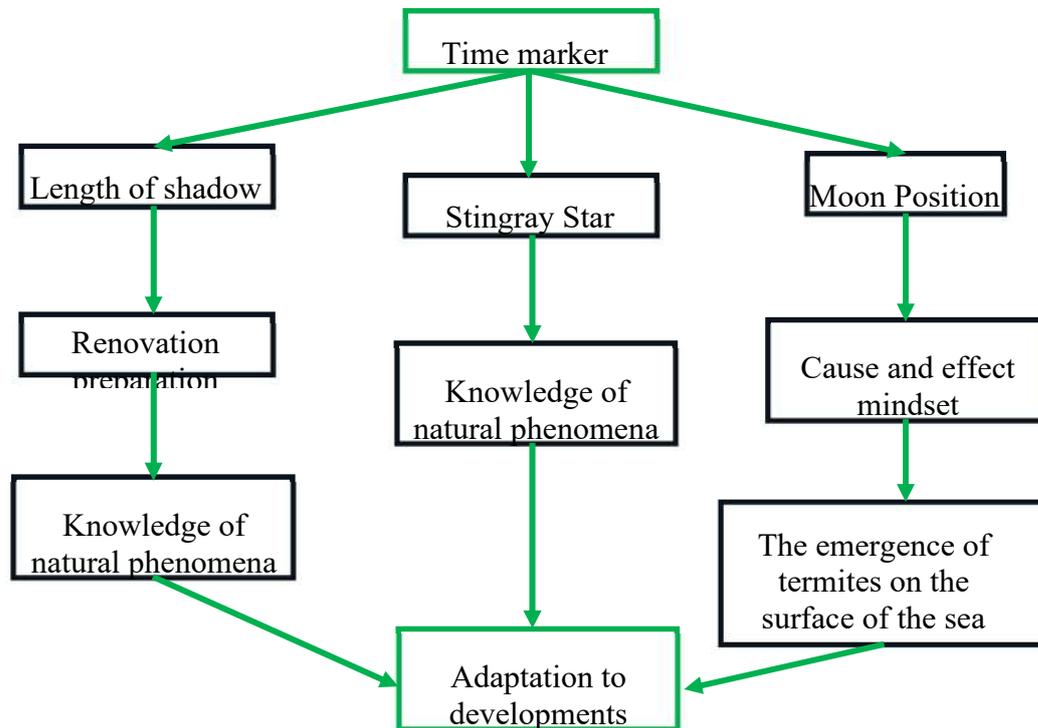


Figure 9. The construction of mathematical thinking, fundamental activity determines time in the Orem Sasadu construction.

Discussion

1. Construction of mathematical thinking: measuring activities to determine the amount of wood needed, connected to geometric concepts.



The activity of measuring the roof trusses begins with creating a drawing consisting of the upper trusses in the shape of a triangle. Next, the trusses below the triangle consist of two rectangles and two squares. Practically, this can be done by many people. It's not surprising that this is a mathematical concept, as this concept is a geometric concept that is considered difficult for students in the classroom. Mathematically, this activity is a geometric activity that can be used as an example in classroom learning, especially regarding the topic of geometric mathematics. A truss is a combination of triangles and quadrilaterals.

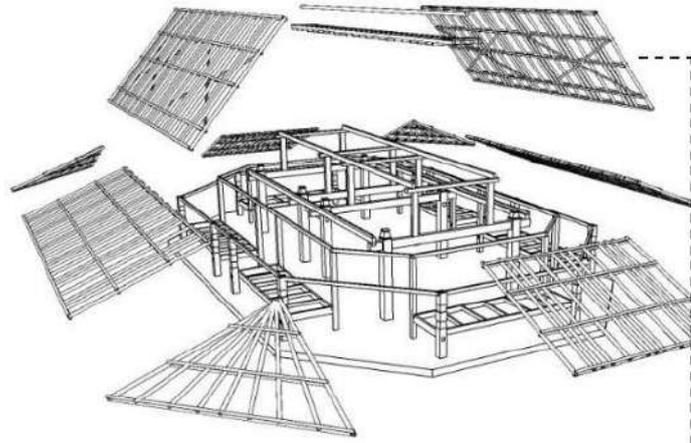


Figure 10. Sketch of Gofara Orem Sasadu

The combination of two triangular planes on the upper roof, two quadrilaterals, two squares, and two triangles at the bottom is an example of geometry learning that can be used as an example in learning geometry.

Based on Figure 6, the triangle and square with the dimensions of hata, jingkal and fathom are as follows:

Table 2. Standard and non-standard sizes

No	Non-standard Size	Standard Size
1.	Jingkal	± 10 to 14 cm
2.	Hasta	± 50 to 60 cm
3.	Depa	± 80 to 130 cm
4.	Bangkawan	The amount of roof used is approximately 40 meters

Based on the interview excerpts from the research results above, it is clear that the measurement process was carried out in various ways. For example, the statement "How many cubits are there?" indicates that this measurement is still used in calculating the cost of materials for the Orem Sasadu renovation. The seating materials were prepared by each group, usually by young people.

Furthermore, the results of the interview "just a glimpse of what they conveyed was like that according to the story, so it is possible that we believe that how many meters may or may not be a matter, because it is clear, for example, oh this (pole) is how many meters high, exactly one, this one has to be replaced, we still have to measure 2 meters, right? So the person who was assigned was the one who measured how many people were assigned." This is a form of



reconstruction of mathematical thinking, where currently the measurement of cubits, fathoms, etc. is still maintained. Adaptation is carried out in addition to using non-standard measurements, currently as a comparison, standard measurements are used, such as meters, centimeters, etc.

Based on this description, it can be concluded that the construction of mathematical thinking concepts occurs during measurements, particularly in certain patterns. Likewise, the reconstruction of mathematical thinking, where currently, measurements of cubits, fathoms, etc. are still maintained. Adaptations are made in addition to utilizing these non-standard measurements, currently using standard measurements, such as meters, centimeters, etc., as comparisons (Salido, 2025) (Bokan, 2025) (Usembayeva et al., 2024) (Ryskul et al., 2025) (Hery Suharna et al., 2025).

Based on this, in this study, a geometric mathematical thinking construction was found which can be illustrated with a mathematical thinking construction as in Figure 11.

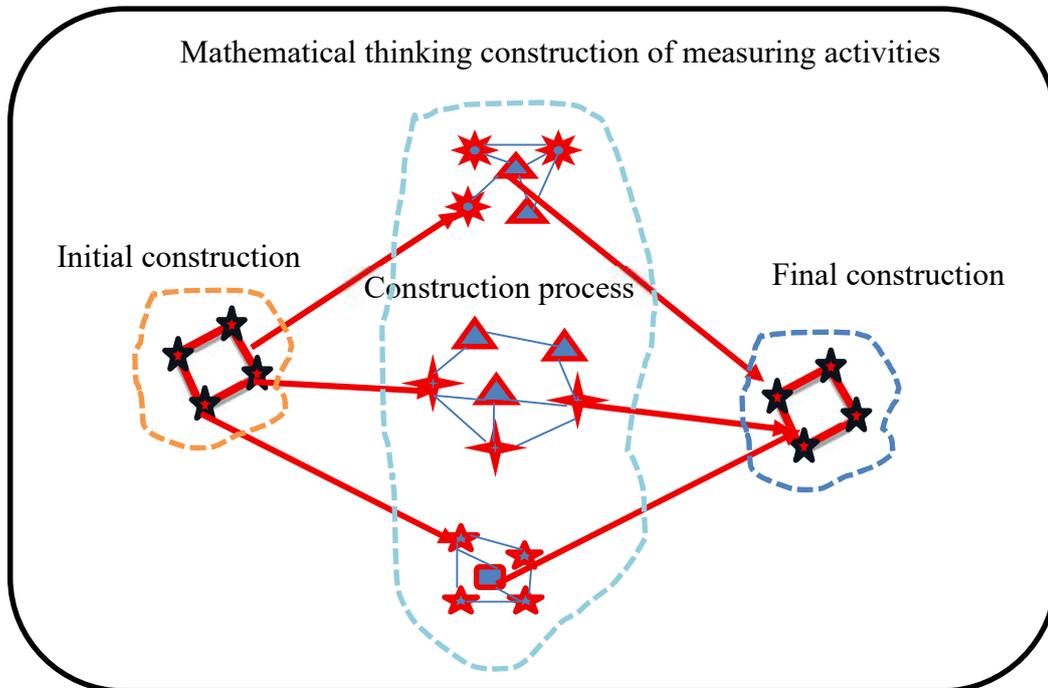


Figure 11. Mathematical thinking construction of measuring activities

The description of the research results on mathematical thinking construction in measuring activities, from this research the following findings were obtained:

Finding 1: The construction of mathematical thinking activities measuring to determine the amount of wood needed is connected to the concept of geometry.

2. Construction of mathematical thinking, counting activities to determine the amount of wood needed, connection of the concept of operations, real numbers are patterned like sequences and series in mathematics.

The mathematical construction of the calculation activity in the Sasadu house renovation activity is based on the agreement of traditional leaders in organizing and



calculating the needs for the renovation activity. Construction is carried out starting from the calculation of the material for the seating is done per group, usually done by the youth. The place is arranged to determine who and why the shape of the seating is arranged in such a way with the position and position according to the customary position such as, the leader, religious leaders, etc. The calculation of the group is usually divided into 6 groups for each group consisting of 10 to 15 people is a calculation process that considers and estimates the expected results. Indigenous communities have carried out the construction of traditional leaders is a structure of thinking formed based on the mathematical reasoning they have, this is mathematics. Mathematically, the process of selecting material for the seating is done per group, usually done by the youth. Meanwhile, making the seating is usually done by the elders assisted by the youth. The process of forming groups is usually divided into several parts, for example, 6 groups consisting of 10 to 15 people. The process of calculating thinking is a mathematical thinking construction.

Based on the interview excerpts, the results above indicate that other calculation processes are carried out in a similar manner. For example, the calculation of materials for seating is carried out per group, usually by young people. Meanwhile, the seating is usually done by the elders with the help of young people. Group calculations are usually divided into six groups, each consisting of 10 to 15 people. This indicates that there is a mathematical concept, namely the concept of sets, in mathematics. Research conducted by Ricardo (2022:92) found that Orem Sasadu has a building structure that has a very strong philosophy in social life.

Based on the description above, the calculation process carried out can be said that the calculation activity was carried out to build Orem Sasadu to be stronger, this is proven by the existing pillars which are almost 100 years old. Based on information from the source, the existing pillars have been in place since 1934, so if they are up to 2025, it means the existing pillars are 91 years old. This calculation was carried out for all wooden components used in Orem Sasadu. Thus, the calculation activity was carried out to determine the amount of wood needed. This result is in accordance with the results of research that wood, bamboo, and leaves from the local environment were used as basic materials, the builders of this building felt very appropriate and integrated with the environment Hikmansyah (2016:82), Gomer (2022) (H Suharna et al., 2020) (H Suharna et al., 2020) (Hery Suharna et al., 2025).

Based on this, in this study, it was found that the construction of mathematical thinking in measuring activities can be illustrated with the construction of mathematical thinking as in Figure 12.

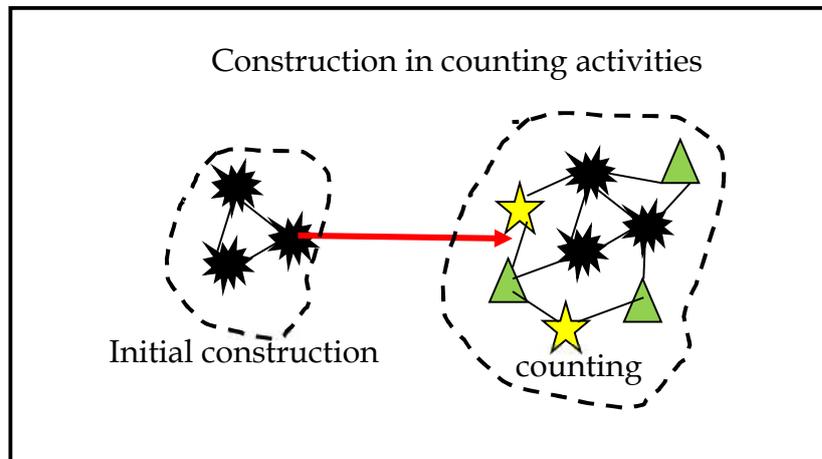


Figure 12. Construction of mathematical thinking in measuring activities

The description of the research results on mathematical thinking construction in counting activities, from this research the following findings were obtained:

Finding 2: The construction of mathematical thinking activities counting and measuring to determine the amount of wood needed is connected to the concept of natural number operations patterned like sequences and series in mathematics.

3. Reconstruction of mathematical thinking activities determines how long the material must be cut, how long the renovation must take and the length of time for the renovation of Orem Sasadu.

The community determines the time to renovate the Orem Sasadu roof every three years. The time is determined based on an agreement and has been passed down through generations, that the renovation of the gofara (roof) is carried out every three years, while also carrying out rituals or thanksgiving. The mathematical concept construction carried out is to determine the time for the gofara renovation. The way of thinking of traditional leaders is a construction of a thought structure formed based on mathematical reasoning, especially in determining the time for renovation of the bamboo section. Conceptually, mathematically, determining this time includes the concept of rows and series. Mathematically, the thought process of selecting materials for seating is carried out per group, usually by young people. Meanwhile, the seating is usually done by the elders with the help of young people. This mathematical construction is a fundamental activity construction measuring by determining time.

Based on the interview excerpts above, it can be seen that the researcher and informants of statements S15, S16, and S17 stated that the process of determining the time was carried out when making plans to renovate Orem Sasadu. The construction of the mathematical concept in determining the time can be seen from the interview excerpt "Judging from the condition, the roof is already. So in general, it is 3 years in total from the gofara term gofara (roof) above the year to come down. So next year it will be the right time for renovations." "The time is determined based on an agreement and has been



carried out for generations that the renovation of the gofara (roof) is carried out every 3 years, while also carrying out rituals or thanksgiving. The reconstruction of the mathematical concept carried out is to determine the time for the renovation of the gofara (Hery Suharna et al., 2025) (Al-shumrani, 2025) (Sari et al., 2024) (Kalkashev et al., 2024) (Saputro et al., 2024).

Based on this, in this study, it was found that the construction of mathematical thinking in the activity of determining time can be illustrated with the construction of mathematical thinking as in Figure 13.

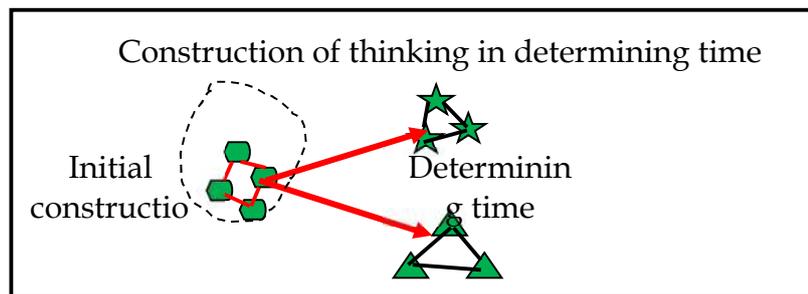


Figure 13. Construction of thinking in determining time

Finding 3: The construction of mathematical thinking activities determining how long the material must be cut, how long the renovation must take and the length of the renovation time of Orem Sasadu.

CONCLUSION

Fundamental Finding: The results of the study obtained that the construction of mathematical thinking activities measuring to determine the amount of wood needed is connected to the concept of geometry, the construction of mathematical thinking activities counting and measuring to determine the amount of wood needed is connected to the concept of natural number operations patterned like sequences and series in mathematics, and the construction of mathematical thinking activities determining how long the material must be cut, how long the renovation must take and the length of the renovation time of Orem Sasadu. **Implication:** The application of mathematical concepts is an interesting and unique aspect of learning in schools. Practical mathematical concepts are more engaging than abstract mathematical concept construction in the classroom. Therefore, concept construction is highly relevant for improving the understanding of mathematical concepts in practice, making mathematics learning more meaningful. **Limitation:** The limitations of this study really need to conduct further research, especially in learning such as Orem Sasadu mathematics learning in project-based Geometry learning. This learning can improve students' mathematical construction in learning mathematics, so that learning is more meaningful how to apply it in mathematics learning as the formation of real mathematical concepts that are applicable with Orem Sasadu objects. **Future Research:** Depth and breadth are interesting things in the research of mathematical thinking reconstruction in Orem Sasadu construction activities to be the goal of future research. This can be done by expanding it by conducting

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quantitative studies and deepening the study by observing each Orem Sasadu activity for a longer period of time.

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