



## Ethnomathematics explorations on the concept of two-dimensional shape in “Tadulako Bulili” folk story

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### Abstract:

To explore the folklore of Tadulako Bulili as a literacy medium in learning the two-dimensional shape, a qualitative descriptive study was carried out with an ethnographic approach. Methods of observation, interviews, documentation, and literature studies were used to collect research data, which were analyzed using the Miles & Huberman interactive model. The subjects of this study were traditional leaders, 3rd-grade elementary school teachers, lecturers, and several students who lived in Sigi Regency. The findings show that Tadulako Bulili's folklore can be thematic contextual learning in two-dimensional material that supports Ausubel, Bruner, and Gagne's learning theory. The results found four fundamental mathematical activities: counting, locating, designing, and explaining. In addition, various two-dimensional shapes were found in the illustrations of objects in the story. The exploration results also provided knowledge and information on the mention of two-dimensional shapes in the Kaili language and replicas of objects that were thought to be found in the story. Folklore could also introduce students to the local wisdom of Central Sulawesi, such as traditional houses, traditional weapons, hunting and farming tools, and the stories themselves.

**Keywords:** Central Sulawesi; Ethnomathematics; Exploration; Folk Story; Two-Dimensional Shape.

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### Introduction

The literacy level of Indonesian children is in the low category. It can be seen from students' lack of interest in reading, which impacts their learning outcomes and mathematical abilities (Oktaviani et al., 2022). If literacy culture is in the low category, it will impact a Nation's progress because literacy helps solve social and cultural problems (Rahmawati, 2016). Thus, we need media that can support numeracy and literacy in mathematics learning, which attract students' motivation and interest in reading and



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make learning fun. Because, media is a means or tool that supports the senses, space, and time limitations. One of them is regional folklore, which can effectively increase students' motivation and interest in reading (Fitriana & Fitriyanti, 2019).

Folklore is a media for mathematical numeracy literacy that can be a means of learning character education, culture, and mathematical abilities that can be used to solve problems in various daily contexts (Fitriana & Fitriyanti, 2019; Nursuciati, 2020). In folklore, students can analyze the reading related to the characters and the story's wisdom, which can be a lesson for students. The cultural values contained in regional folklore are the foundation of national character, which is important to instill in every student so that they can understand, interpret, appreciate, and realize the importance of cultural values in carrying out every life activity. Besides that, students can also analyze the information presented in the story related to mathematical concepts (two-dimensional shapes) through cultural aspects (Nisa', 2018).

Learning that can bridge between mathematics, community culture, and character is Ethnomathematics (Alghar et al., 2023; Khadijah & Sutamrin, 2022; Nisa', 2018). Ethnomathematics integrates mathematical concepts through mathematical activities based on cultural elements or perceptions (Khadijah & Sutamrin, 2022; Utami et al., 2019). Ethnomathematics can also improve mathematical numeracy and literacy skills (Surat, 2018). There are several studies related to ethnomathematics and literacy, such as ethnomathematics on the cardinal directions based on the perspective of regional languages (Khadijah & Sutamrin, 2022), ethnomathematics with lontara script (Syahrawati, 2022), ethnomathematics and Javanese primbon (Utami et al., 2019), etc. From this research, it can be seen that the integration of mathematical objects can be obtained through cultural elements that are around us, which are also beneficial for improving the quality of learning, interest, motivation, literacy, and learning outcomes in mathematics, as well as preserving and strengthening cultural insights and respecting regional and National culture (Khadijah & Sutamrin, 2022).

Two-dimensional shapes are one of the materials related to mathematical numeracy and literacy. The two-dimensional shape is difficult to learn because many students make conceptual errors, including in solving contextual problems (Abdul Rohman et al., 2021; Anam, 2021; Suciati, 2019). Thus, it is necessary to find appropriate learning methods and interesting learning media to make it easier for students to understand the concept of two-dimensional shapes, especially for elementary school students (Chuseri et al., 2021; Rachmawati et al., 2021). There have been many studies related to ethnomathematics and two-dimensional shapes that revolve around temples (Hardiarti, 2017), museum (Setiana et al., 2021; Wahyuni & Alifia, 2022), regional cloth (Merdja & Restianim, 2022), and traditional houses (Zebua, 2020). However, researchers want to associate ethnomathematics and two-dimensional shapes with something different. One way is with folklore. In folklore, students will analyze the information provided, and then students will imagine an object that is thought to be found in the story. Next, students will describe the object into a two-dimensional shape. Thus, folklore can link the concepts of flat shapes, character formation, and increasing literacy and numeracy culture.

There have been many previous studies related to regional folklore, such as folklore that is associated with learning (Nursuciati, 2020), folklore with a Hypothetical Learning Trajectory design (Putri, 2012; Sary, 2017), development of learning media through computer-based Legend (Amalia et al., 2019), and others. However, this research does not use ethnomathematics. Research on regional folklore associated with

ethnomathematics has also been carried out by Fitriana and Fitriyanti (2019), Purnama et al. (2019), Darmayanti et al. (2023), Nova and Putra (2022). However, this research is development research or literature study research. There is some research linking folklore and two-dimensional shapes, as is done by Putri (2012) and Purnama et al. (2019); however, both of these studies are developmental studies that raise stories that do not originate from Central Sulawesi Province.

The Kaili tribe is one of the tribes in Central Sulawesi Province. Many Kaili tribes inhabit the city of Palu, Sigi Regency, Donggala Regency, and Parigi Moutong Regency. The Kaili tribe has many language dialects (i.e., Ledo, Da'a, Tara, Unde, Undepu, Ado, Rai, and others). What distinguishes one dialect of the Kaili language from another is the word "no" (Herawati, 2017). Like other provinces, Central Sulawesi Province also has regional literature in the form of folklore, a cultural asset that should be preserved. Folklore of the Kaili tribe is not exposed to learning at school even though the school is in the Kaili tribe's environment, as was observed at SDN Pengawu that the stories used in learning still address regional folklore outside Central Sulawesi. In addition, observations were also made on several children and students who live in Sigi Regency (Kaili tribe) to find out the extent of their understanding of the local folklore. As a result, most of them do not know about their local folklore. They only know folklore that is outside their area. Therefore, researchers need to bring up the regional folklore of the Kaili tribe so that local children can pass down history from generation to generation while at the same time increasing their love for their regional culture. So that, with the existence of ethnomathematics-based children's literature (regional folklore) can provide positive things in regional knowledge and mathematical concepts, including literacy skills, and character education, to the preservation of regional culture in a more meaningful way (Fitriana & Fitriyanti, 2019). Therefore, students will get to know the folklore and be able to recognize cultural elements contained in the story that students may not know. Thus, it is necessary to guide students well so that they can understand the story and its cultural elements and relate these elements to the concept of a two-dimensional shape.

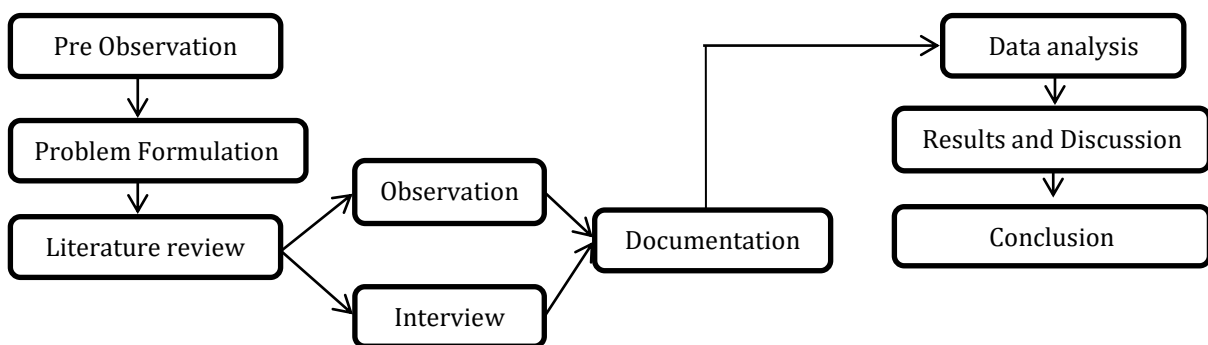
Folklore of the Kaili tribe is part of the culture of the Kaili people that grows and develops from generation to generation and is passed on orally that describes the situation, phenomena, conditions, character, and attitudes of the Kaili people as a whole. (Herawati, 2017). Folk tales can take the form of relatively traditional fables, legends, sages, myths, and parables. There are several folk tales from the Kaili tribe, including Pinggavea, Tadulako Bulili, Snake Jalimoo, I Raja Muda, Topoana Papitu, I Ali, and so on. However, in this research, the exploration only focuses on the story "Tadulako Bulili" because it is considered suitable for two-dimensional shapes. Apart from that, the "Tadulako Bulili" folklore also displays many elements that can be studied further, such as traditional houses, farming tools, traditional weapons, and elements of the story itself, which teach about the character which is important to convey and study, especially in the learning process that is thematic and contextual. Based on the description above, this study aims to describe and analyze the ethnomathematics in the folklore "Tadulako Bulili" as a literacy medium in elementary school learning on two-dimensional shapes.

## **Methodology**

Qualitative descriptive research using ethnographic methods explored the concept of two-dimensional form in the folklore "Tadulako Bulili". The Ethnographic Method is a

qualitative approach to describing, explaining, and knowing the cultural elements of a particular community or tribe by analyzing the data that has been collected (Karimah et al., 2021; Zayyadi, 2017).

The research subjects consisted of 2 traditional figures who mastered Kaili literature (one of them is a traditional figure who is still descended from Madika Donggala who is in Pombewe village, Sigi Regency), one 3rd-grade teacher at Pengawu Elementary School, two lecturers who understand Kaili history, and 60 students Pengawu elementary school and 85 students collage who live in Sigi Regency (especially the Kaili tribe). Researchers are instruments that play a role in data collection because they are directly involved in collecting data through literature studies, documentation, observations, and interviews. Literature studies are used to obtain information about the folklore of the Kaili tribe. Documentation is used to collect additional data for research, such as photos and field notes. Observations are made to look at two-dimensional shapes in elementary school mathematics learning and sight historical objects in the Central Sulawesi Provincial Museum related to the folklore "Tadulako Bulili." Interviews were conducted to obtain information related to the story of Tadulako Bulili (traditional figure), two-dimensional forms in schools (teachers), and information regarding the extent to which students know the folklore of their area. Documentation and interviews were analyzed using the triangulation method to learn more about the values contained in the folklore of the Kaili tribe. Interviews with traditional figures used an interview guide with basic statements related to literature in the folklore of the Kaili tribe. The research procedure is presented in Picture 1.



Picture 1. Research Procedure

Data analysis was carried out to reveal ethnomathematics elements in the Tadulako Bulili folklore, which focuses on two-dimensional shapes. The data analysis technique used was Miles & Huberman's interactive analysis (Suciati et al., 2021), which consisted of (1) data collection; (2) data reduction; (3) data presentation; and (4) conclusion. In addition, this study also used document analysis that was used to analyze the Kaili tribe folklore in depth. Data triangulation was generated based on the source, method, and time to get the data validity. Source triangulation showed the data validity obtained from primary (direct) and secondary sources (websites and books). Method triangulation was carried out to check the validity of the data from the various data collection methods. At the same time, time triangulation was carried out to check the validity of the data taken at different times (Karimah et al., 2021; Sudirman et al., 2017). In this case, researchers check and compare information/data obtained through interviews (2 traditional figures, lecturers, teachers, and students), website studies,

folklore books studies, observation results (museums and schools), and documentation results (photos and field notes) in different times and situations (place conditions and research time).

## Results and Discussion

To explore ethnomathematics in the folklore "*Tadulako Bulili*" based on versions Kusrini (2010), before a literature study related to the folklore of the Kaili tribe was carried out, such as reading the story to choose the story to be explored. After that, interviews were conducted with 2 (two) informants who knew about Kaili ethnic literature, especially the *Tadulako Bulili* story. Then, the information was confirmed in documentation, which was carried out again through a literature search for document analysis.

The interview description with informants (2 traditional figures) is presented in the following dialogue.

Researchers : *What is the folk story "Tadulako Bulili" about?*

Informants : *The story of Tadulako Bantaili and Mokeku, who carried the rice barns from Higi to Bulili. (Higi was the name of the area before being replaced by Sigi)*

Researchers : *Who are the characters in the folk tale "Tadulako Bulili"? What is about the characters in the story?*

Informants : *Tadulako Bantaili, Mokeku, Montambavu, dan Lalove.*

Researchers : *What lessons can be learned from the folktale "Tadulako Bulili"?*

Informants : *Discipline, firmness, courage, honesty, and truth.*

Based on interviews with the two informants, it can be seen that the story "Tadulako Bulili" is a regional heroic folk tale that teaches about various good qualities, which is very suitable for reading by elementary school students. But this folklore has not been well preserved. It can be seen from the low knowledge of students about folklore and local heroic figures (based on interviews and observations of elementary school and university students). After the interview, further document analysis was carried out to see the mathematical analysis in the story and to confirm the information provided by the informant.

The ethnomathematics exploration of the *Tadulako Bulili* folklore is focused on the two-dimensional concept. The choice of a two-dimensional concept is considered suitable for research on *Tadulako Bulili* folklore. From these folk tales, various words are analyzed that make it possible to imagine or describe an object with the appropriate two-dimensional shapes. The following analysis results contained in the folklore "*Tadulako Bulili*" are presented. The story's snippet is a sentence: "The inhabitants live by farming." Based on this sentence, students will think and understand that if someone is a farmer, then their workplace is a rice field. If students imagine a rice field, they will describe the rice field shapes in a quadrilateral, such as a rectangle or parallelogram.

In addition, in the "farming" activity, students will describe that someone will bring farming equipment, such as plows and hoes (Picture 2). The two-dimensional shapes of the plow and hoe are triangle, square, rectangle, and trapezoid (Picture 3).



Picture 2. Farming Equipments



Picture 3. Two-dimensional Shapes Illustration of Plow and Hoe

The above analysis is also supported by the interviews with the two informants (2 traditional figures), namely:

Researchers: *What are the livelihoods of the people in Bulili village?*

Informants : *Farming, hunting, gardening, and gathering forest products.*

Researchers: *What tools do the Bulili people use in farming?*

Informants : *Taono (machete), baliu (axe), Pomangi (hoe), Sula (crowbar), Pandoli (crowbar), Sube, Posaku (tugal), Pua (ani-ani).*

Based on interviews, the Bulili people did not yet use plows. But they still used tools for farming that were simple and traditional, such as *Taono* (machete), *Baliu* (axe), *Pomangi* (hoe), *sula* and *Pandoli* (crowbar), *sube*, *posaku* (tugal), and *pua* (ani-ani) which are used for farming. If we look at farming tools, we will see several two-dimensional shapes. In *Taono* (Picture 4), you will see rectangles and trapezoids (Picture 5). In *pomangi* (Picture 2) you will see rectangles and squares (Picture 3).



Picture 4. *Taono* (Machete) and Two-dimensional Shapes Illustration

Based on these data, it can be seen that most of the tools used in farming form square, rectangular, and trapezoidal shapes. Furthermore, in the sentence "the commanders of Mokeku, Bantaili, and Molove are in charge of protecting the safety of Bulili village from enemy attacks," it is assumed that a commander must have weapons for self-defense. The weapon used by Bantaili, Mokeku, and Molove is *Guma Tadulako* (Picture 5).



Picture 5. *Guma Tadulako* and Two-dimensional Shapes Illustration

*Guma Tadulako* is a traditional weapon used by the people of Central Sulawesi as an heirloom weapon because it has been passed down from generation to generation and is classified as a powerful mandraguna. *Guma Tadulako's* supernatural powers

include being able to detect enemies from afar. When an enemy is detected from afar, *Guma* automatically lies in the middle of the owner's door. If we pay attention to the two-dimensional shape of *Guma Tadulako*, it is almost the same as the two-dimensional shape of Taono. On *Guma Tadulako*, a carving on the wooden handle looks like a triangle. Based on interviews with traditional figures. Besides *Guma*, a *Tadulako* must also have several weapons, namely a *Tampi Toko* (spear) and *Sopu* (chopsticks). If the two objects are described as two-dimensional shapes, they will produce triangles, kites, and rectangles (Picture 6).



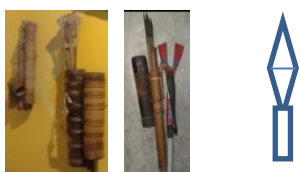
Picture 6. *Tampi Toko*, *Sopu*, and Two-dimensional Shapes Illustration

Next is the sentence, "**King Sigi likes to hunt.**" Hunting sentences can indicate the hunting tools used, such as spears, arrows, and other weapons (Picture 7). From these tools, it can be seen that they have sharp edges. Another similarity is that the tip of the spear and the tip of the arrow form a shape, namely a triangle, kite, and rectangle (Picture 6).



Picture 7. Examples of Traditional Hunting Tools

However, the hunting weapon used in the Central Sulawesi area is *Sopu* or chopsticks. *Sopu* is made of *vulu* (bamboo reed) and used for hunting or self-defense against various threats (Picture 8). If we pay attention to the tip of the chopsticks, then we will see the shapes of triangles, rhombuses, and rectangles.



Picture 8. *Sopu* and Two-dimensional Shapes Illustration

It is in line with the interview, namely:

Researchers: *What is the purpose of Madika (King) Sigi going to Bulili village?*

Informants : *The King goes hunting and then marries Madika Bulili's daughter.*

Researchers: *What weapons did people use for hunting at that time?*

Informants : *Toko (spear), Kanjai (spear like a trident), Toko Tambi (haired spear), Sopu (Chopsticks), dan Guma (machete)*

The next sentence is "Finally, King Sigi was staying at the resident's house." In this sentence, there is the word "house". Students will describe houses with various shapes, such as triangles, squares, rectangles, and so on (Picture 9).



**Picture 9.** House Drawing Illustration

However, the word "house" referred to in *Tadulako Bulili's* story, is the traditional house of the *Bulili* village of the Lore tribe, namely the *Tambi* house (Direktorat Warisan dan Diplomasi Budaya, 2018). The *Tambi* house is a stilt house with short pillars. The *Tambi* house is made of strong *bonati* wood and a thatched roof that extends downwards. The *Tambi* house has a *Pebaula* style, which means glory (wealth and power), and a *Bati* style, which means prosperity and fertility. In a *Tambi* house building, one must pay attention to the direction of the compass; the *Tambi* house must face the north-south direction. The shapes of the *Tambi* house look like a triangle, rectangle, and trapezoid (Picture 10). The triangular meaning of the *Tambi* house symbolizes horizontal and vertical relationships. The horizontal relationship symbolizes the relationship with fellow human beings, while the vertical relationship symbolizes the human relationship with the creator.



**Picture 10.** *Tambi* House, *Buho*, and Two-dimensional Shapes Illustration

Based on the interviews, *Tambi* and *Buho's* house is the language of the *Bada* tribe, meaning house and granary. Meanwhile, if we talk about houses in the Sigi area using the *Kaili Ledo* language, we will use the terms *Banua Kataba* or *Gandaria* (house) and *Gampiri* (granary). The *Banua Kataba* traditional house is a square-sized stilt house with a thatched roof covered with palm fiber. In *Gampiri* there is *Tandingi* (a round *gampiri* part located on a pole that can stop rats). In *Gampiri*, there are triangular, square, rectangular, and circular shapes.

The sentence "He always pampers the girl like a pearl" focuses on the circular pearl. And the sentence "The wife is still standing at the door of the house" focuses on the rectangular door. Then, the sentence "We were sent to ask for rice in the barn" focuses on the word barn. The granary of the *Bulili* people is found in *Buho*, an additional building outside the *Tambi* house that has the same shape as the *Tambi* house. *Buho* has two floors; the first is a living room, and the 2nd floor is a granary or rice storage area (Direktorat Warisan dan Diplomasi Budaya, 2018). Based on the shape of *Buho*, which is similar to *Tambi's* house, students will describe it as triangular or rectangular (Picture 10). However, based on the story, "Tadulako *Bulili* took the barn belonging to King Sigi", it means that the barn was *Gampiri* (Picture 11).



It is in line with the interview, namely:

Researchers : *What is the name of the rice barn owned by King Sigi??*

Informants : *The Sigi people call them rice barn Gampiri.*

Researchers : *What is the shape of Gampiri??*

Informants : *Gampiri is almost the same as the shape of a house on stilts, except that on the poles, there is Tandingi, which functions to stop rats.*



**Picture 11.** *Gampiri*

For the sentence "With complete weaponry, the Sigi troops are ready to chase Bantaili and Mokeku", we will focus on the weapons owned by King Sigi's troops, namely *Surampa* or *Tavala Kanjai* (Spear), *Doke*, *Kaliavo* (Shield).



**Picture 12.** *Surampa* or *Tavala Kanjai*, and Two-dimensional Shapes Illustration

*In ancient times, Tavala Kanjai* was usually used by royal troops to fight. *Tavala Kanjai* or *Surampa* is shaped like a trident but not a trident because the *kanjai* spear has two blade tips, where the lower end is in the shape of an isosceles triangle (Picture 12), while the upper end has three blades that are not only sharp but sharply curved. We can see triangles, rectangles, and kites if described in geometry. Besides *Surampa*, *Doke* is also a spear. *Doke* generally has a single blade (rhombus shape) and a stalk made of wood (Picture 13). *Doke* is divided into several parts, namely *matanu doke* (blade), *pando* (crown), *duruka* (stalk), and *tambuli* (lower end). If you pay attention to the shapes of *Doke*, you can see the kites, rhombuses, triangles, and rectangles.



**Picture 13.** *Doke* and Two-dimensional Shapes Illustration

The next tool is *Kaliavo*, used as a shield or self-defense against enemies. *Kaliavo* is a shield made from wood carved with distinctive patterns that have meaning. *Kaliavo* has the meaning of heroism, courage, and self-safety. If we pay attention to *Kaliavo*'s shape, there are triangles and rectangles (Picture 14).



**Picture 14.** Kaliavo, Patterns, and Illustrations of Two-dimensional Shapes

It is in accordance with the interview with traditional figures below.

Researchers : *In pursuing Tadulako Bulili, what weapon did Tadulako (Panglima) Madika (King) Sigi use?*

Informants : *They use Guma (machete) and Toko (spear).*

Researchers : *How did Tadulako Bulili escape from Tadulako Madika Sigi?*

Informants : *Tadulako Bulili nosumakan Gampiri (raised). So the Tadulako took turns holding back the enemy and upholding the Gampiri (granary).*

The sentence "They immediately crossed the river while destroying the boats belonging to Raja Sigi which were on the banks of the river" contains the word "boat," which students can imagine as a trapezoidal shape (Picture 15).



**Picture 15.** Two-dimensional Shape Illustration on a Boat

From the analysis of *Tadulako Bulili's* story, several geometrical concepts and some fundamental mathematical activities are obtained as follows.

**Table 1.** Ethnomathematics Elements in the Folktale "*Tadulako Bulili*"

Objects Illustration in Folklore	Two-dimensional Concept
Ricefield	Rectangle, parallelogram
Boat	Trapezoid
<b><u>Farming Tools</u></b>	
<i>Taono</i>	Rectangle, trapezoid
<i>Pomangi</i>	Square, rectangle
<b><u>Traditional Weapon</u></b>	
<i>Guma Tadulako</i>	Rectangle, trapezoid, triangle
<i>Sopu</i>	Triangle, rhombus, rectangle
<i>Tavala Kanjae or Serumpa</i>	Triangle, rectangle, kite
<i>Doke</i>	Triangle, kite, rectangle, rhombus
<i>Kaliavo</i>	Triangle, rectangle
<b><u>Custom Home</u></b>	
<i>Tambi house</i>	Triangle, rectangle, trapezoid
<i>Buho</i>	Triangle, rectangle
<i>Banua Kataba</i>	Triangle, square, rectangle
<i>Gampiri</i>	Triangle, square, rectangle, circle

From this story, we can bring the two-dimensional concept into the *Kaili* language, especially *Kaili Ledo*. Even though the use of the *Kaili* language in the two-dimensional concept is not stated by default, it is based on the *Ledo Kaili* language dictionary (Evans, 2003) then the naming of two-dimensional shapes as follows (Table 2):

**Table 2.** The Two-Dimensional shape name is based on the Kaili Ledo language

The Two-Dimensional Shape in English	The Two-Dimensional Shape in Kaili Language
Triangle	<i>Sulapa tatalu, navenga</i>
Square	<i>Sulapa ampa, patanjoki</i>
Rectangle	<i>Sulapa, patanjoki, pata njulapa ndate</i>
Circle	<i>Lili, tiku</i>
Kite, Diamond	<i>Lagundi, lae-lae, sisi</i>
Rhombus	<i>Vatulemo, silosa</i>

While the interviews, namely *segi tatalu* (triangle), *sulapa ampa* (square), *segi ampa ndate* (rectangle), *nalimpoku*, *lili* (circle), *vatulemo* (rhombus), *lagundi*, *vatulemo* (kite). As shown in Figure 16 explains the *vatulemo* model in Kaliavo. If we pay attention, it turns out to form a rhombus. It means that *vatulemo* shows a rhombus.



**Picture 16.** *Vatulemo* Model in Kaliavo (shield)

Apart from discovering the two-dimensional concept contained in the story, there are several fundamental mathematical activities in the folklore "Tadulako Bulili," namely:

1. *Counting*, This activity can be seen from counting the commanders' numbers in *Tadulako Bulili's* story, namely, three commanders named *Bantaili*, *Mokeyu*, and *Molove*. Besides that, this activity can be seen in counting the types of tools for farming, hunting, and traditional weapons.
2. *Locating*, In this study, finding activity can be seen from several activities, namely:
  - a. Determination of the Bulili village is located in the Poso Regency, which borders Sigi Regency and the Sigi Kingdom in Sigi Regency.
  - b. Higi is mentioned in the current Sigi Regency.
  - c. Determining the direction in the *Tambi* House building is facing north-south.
  - d. The architecture of the *Tambi* house is like the location of the granary in the *Tambi* house (*Buho*).
3. *Designing*, this activity can be seen from several activities, namely:
  - a. Creating geometric shapes on farming tools, hunting weapons, traditional weapons, and traditional *Tambi* houses.
  - b. Designing the shape of fields, plows, hoes, houses, doors, pearls, and boats in students' minds in general.

4. *Explaining*, this activity can be seen from the activity of explaining and describing the contents of the Tadulako Bulili folklore logically and systematically towards the phenomena and events contained in the Tadulako Bulili storyline, such as:
  - a. Explain the shape and meaning of traditional weapon symbols used in the folklore of Tadulako Bulili.
  - b. Explain the shape and symbolic meaning of the *Tambi* traditional house found in Tadulako Bulili's story.
  - c. Explain the Kaili language for the two-dimensional concept.

In addition to data collection through literature studies and interviews with traditional leaders, observation and interviews were also conducted with 3rd-grade elementary school teachers to find out about learning related to two-dimensional shapes. The observations from 3rd-grade elementary school teachers showed that the material on two-dimensional shapes in school thematic books still used general stories and did not highlight regional culture, as the interviews conducted with teachers showed that teachers presented material following the school guidebook. Thus, children were not yet familiar with regional matters such as folklore and were familiar with cultural elements, such as traditional houses, traditional weapons, and the local language about two-dimensional. It was supported by observations and interviews with several children and students who lived in the Sigi Regency. The search results revealed that most didn't know their area had folklore. It showed that if folklore were not introduced from the home or school environment, folklore would gradually disappear and become just memories. The observation and interview results showed that 100% of Pengwu Elementary School students did not know the folklore of their area, and 95% of students from the education faculty of Alkhairaat University also did not know the folklore.

Geometry material is among the most difficult materials because many make conceptual errors and solve contextual problems (Abdul Rohman et al., 2021; Anam, 2021; Suciati, 2019). Thus, it is necessary to find appropriate learning methods and interesting learning media to make it easier for students to understand the concept of geometry (Chuseri et al., 2021; Rachmawati et al., 2021). Teaching the two-dimensional concept of wake can be done through folklore. Through stories, students will imagine and express their imagination through pictures (visual). According to Dienes, mathematical concepts that are presented concretely will be easy to understand. It means turning abstract things into visuals. Meanwhile, visualization is an effective way for students to increase their understanding of complex and abstract mathematical concepts (Suciati, 2019). In other words, folklore can develop students' creative thinking skills and media for self-expression. It is in accordance with Ausubel's opinion about meaningful learning, Bruner's approach to interactive and constructive learning (enactive, iconic, and symbolic learning), and Gagne's opinion about learning concepts that are demonstrated (Dahar, 2011; Darmayanti et al., 2023)

Folklore can also stimulate students' interest in reading, a means of communication, and broaden students' insight into their regional literature. In addition to teaching mathematical concepts, folklore is a character builder for students and a form of preserving hereditary heritage by introducing almost forgotten regional wealth contained in these folklores. Local wisdom-based learning is a form of contextual-based learning that is well implemented and developed at the elementary school level as a learning innovation (Khadijah & Sutamrin, 2022; Surat, 2018). Through folklore,

learning is contextual and thematic in the Elementary School curriculum for the 3rd grade. Besides teaching math lessons, folklore can also teach Civics lessons that discuss character traits, Indonesian language lessons that teach about reading aloud or composing paragraphs, and SBDP lessons that introduce the typical culture of Central Sulawesi, especially the Kaili tribe related to traditional weapons and houses, hunting and farming tools, and the Kaili language. It is certainly suitable to the opinion of ethnomathematicians that the development of mathematics cannot be separated from cultural values and elements that can improve students' mathematical abilities, support mathematical literacy, and strengthen student character (Nisa', 2018; Surat, 2018).

Ethnomathematics through Central Sulawesi folklore can be used as learning literacy material, especially at the elementary school level, because the students in learning have heard the folklore is still related to folklore originating from outside Central Sulawesi. The lack of learning media elevates Central Sulawesi's local wisdom so that the stories of Central Sulawesi culture are less well-known to students through learning at school. With ethnomathematics, it is hoped that students will better understand mathematical objects and their culture in an effective and contextually meaningful way so that they build a pride spirit in students for local wisdom by their region and develop student character and competence (Amalia et al., 2019; Darmayanti et al., 2023; Fitriana & Fitriyanti, 2019; Jabali et al., 2020; Yuliana, 2017).

As for the objects contained in the Tadulako Bulili folklore, replicas can be seen in the Palu City environment as contextual learning for students, such as the giant Guma in the Guma Palu Traditional Weapons Museum, Kaliavo and Doke in the Songgolangi Monument, while the Tambi House Design can be seen from various adaptations of government buildings such as the Central Sulawesi Province DPRD Building. However, to make learning more meaningful, students can be invited to tour the Prov. Central Sulawesi to see historical relics such as traditional weapons and miniature traditional houses, which are almost the same as in the description of the Tadulako Bulili folklore.

## **Conclusions and Recommendations**

Based on the description above, it can be concluded that the Tadulako Bulili folklore can be a thematic contextual learning on the two-dimensional shape that supports Ausubel's theory of meaningful learning, Bruner's interactive and constructive learning process (enactive, iconic, and symbolic learning), Dienes' theory of the mathematical concepts presented concretely, as well as learning the concepts demonstrated by Gagne (Behavioristic). The ethnomathematics exploration of the "Tadulako Bulili" folklore has four fundamental mathematical activities (i.e., counting, locating, designing, and explaining). Besides that, the exploration results also provide knowledge or information regarding the mention of two-dimensional shapes in the Kaili language and replicas of objects that are thought to be found in stories that can be associated with several two-dimensional shapes such as triangles, parallelograms, squares, rectangles, rhombuses, kites, trapezoids, and circles obtained from various illustrations of objects contained in the story. Folklore can also introduce students to the local wisdom of Central Sulawesi, such as traditional houses, traditional weapons, hunting and farming equipment, and the stories themselves. Therefore, further research is needed regarding developing ethnomathematics-based teaching materials that

highlight the culture of Central Sulawesi, especially the Kaili tribe, so that their culture is not forgotten and lost to time.

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