Ethnomathematics Exploration in Woven Bamboo in Pecalongan Village Sukosari Bondowoso

Sumining[1(✉)], Agustin Styaningrum[2], Suminah[3], Anang Prayitno[4], and Usfuriyah[5]

[1] MIN 2 Jember, Jember, Indonesia
suminings@gmail.com
[2] SMP Negeri 1 Tempurejo, Jember, Indonesia
[3] SMP Negeri 1 Jombang, Jember, Indonesia
[4] SMP Negeri 2 Ambulu, Jember, Indonesia
[5] SDN Wonojati 01 Jenggawah, Jember, Indonesia

Abstract. Weaving is a technique of connecting two or more objects or materials to weave by crossing each other so that they do not separate from each other. The material used in the making incorporated in Pecalongan Sukosari Bonodowoso Village is bamboo. This study uses a qualitative approach with an ethnographic approach. The goal is to understand the concepts experienced by research subjects with data collection carried out by observation, documentation, and interviews. The result of the research is that there are mathematical concepts in woven bamboo. The relationship between Jesse and geddang with learning mathematics is to get up space and wake up flat in the form of circles and cubes.

Keywords: ethnomathematics · exploration · woven bamboo

1 Introduction

Culture is a habit that is owned by every community. According to the Big Indonesian Dictionary (KBBI), culture is thought, reason and customs. In contrast, culture results from activities and the creation of the human mind, such as beliefs, arts, and customs (Astri et al., 2013).

Most people do not realize that the activities they do contain mathematical concepts. The tendency of society to view mathematics as only a subject included in the classroom. At the same time, mathematics is often used in everyday life, such as measuring length. According to Bishop, mathematics is a form of culture [1]. Mathematics and culture cannot be avoided in everyday life because culture is a unified whole that exists in society. At the same time, mathematics is the knowledge used by humans to solve the problems of everyday life.

According to Astri [2]. Stated. One thing that can bridge culture and mathematics is ethnomathematics [1] According to Zulkifli and Dardiri (2016), ethnomathematically consists of three words, namely the prefix "ethnic," which means something comprehensive that refers to the socio-cultural context. The second root word, "mama," tends to

mean explaining, knowing, understanding, and doing activities. The suffix "tik" comes from techne and has the same meaning as technique [2].

Everyday life, because culture is a The study of ethnomathematics in learning mathematics covers all fields. Many studies on ethnomathematics have been carried out, one of which is in handicrafts such as weaving. Weaving is a handicraft carried out by rural communities; weaving usually uses bamboo, rattan, and other leaves that can be used as woven materials. The art of weaving is a genetic heritage of ancestors. Based on the results of this observation, there is a mathematical element of woven art that can be used in learning as a source of learning. With this, it can motivate students and add insight into their education.

Several previous studies related to the ethnomathematical exploration of woven bamboo, including research conducted by Fahmi Alan Fajar et al. regarding the activities of measuring, counting, and designing bamboo to be woven. Laila is insane about the steps in making woven bamboo. So, woven bamboo benefits the community, especially in everyday life.

1. Exploration

According to the Big Indonesian Dictionary, exploration is the exploration to gain more knowledge, especially about the natural resources found in that place. According to Sahertian, exploration is an activity carried out in the context of learning. It refers to a study (exploration) to gain more knowledge about a situation or object by collecting data to produce a new form of visualization. Wahyuni dkk (2019) [3].

Based on these two understandings, it can be concluded that exploration is an activity carried out by a field researcher with the aim of gaining knowledge of a phenomenon and adding insight.

2. Ethnomathematics

Ethnomathematics is the cultural anthropology of mathematics and mathematics education [4] fe. According to Zulkifli and Dardiri (2016), ethnomathematically consists of three words, namely the prefix "ethnic," which means something comprehensive that refers to the socio-cultural context. The second root word, "matema," tends to mean explaining, knowing, understanding, and doing activities. The suffix "tik" comes from techne and has the same meaning as technique [2].

Terms according to D'Ambrosio, 1985, mathematics is practiced between identified cultural groups such as ethnic, national communities, labor groups, children of specific age groups, and professional classes [5].

So it can be concluded that ethnomathematics is a habit that cultural groups use in carrying out mathematical activities Wahyui (2016) [6].

3. Woven Bamboo

Weaving is a handicraft made by rural communities. The material of this wicker is bamboo, rattan, and so on. However, the researchers here focus on woven bamboo.

Weaving is a handicraft process that requires patience and thoroughness. Weaving is the crossing between weft and warp; weft is a ribbon strand, while the warp is a ribbon or strand perpendicular to the weaver [7]. Bamboo is the material used in weaving.

2   Methods

This study uses a qualitative method with an ethnographic approach. The qualitative approach aims to understand the concepts experienced by research subjects. The ethnographic approach is empirical and theoretical and seeks an in-depth description and analysis of culture based on intensive field research (Yoki Yusanto, 2019). Data collection is done by observation, documentation, and interviews.

3   Result and Discussion

Weaving is the crossing between weft and warp; weft is a ribbon strand, while the warp is a ribbon or strand perpendicular to the weaver (Febriana Adi Kurniawan, 2015). Weaving is a technique of connecting two or more objects or materials to weave by crossing each other so that they do not separate from each other [8]. The material used in making plaits in Pecalongan Sukosari Bonodowoso Village is bamboo. Before the woven fabric is used, the bamboo is dried first to make it flexible and not easy to mold.

The results of this woven are often used for household furniture such as rice containers, containers for celebrations, containers for cleaning rice, and washing rice, which the people of Pecalongan village call kesseh and gheddheng. Both things have something to do with learning mathematics because it has a spatial shape. Below will be discussed further the relationship between woven bamboo and learning mathematics.

A. *Kesseh*

Kesseh is woven from bamboo, used as a place for rice, washing rice, and a container for celebrations. Kesseh is made from thin slices of bamboo, which are then woven tightly and then shaped with a round surface and a rectangular base. On this side of the kesseh surface, a biker is given, which is wrapped around the kesseh woven to be given a rope (Fig. 1).

The mathematical concept contained in the kesseh form is a circular surface and a cube-shaped base. On the surface of the kesseh it has a diameter of 35–60 cm (Fig. 2).

Fig. 1. Kesseh

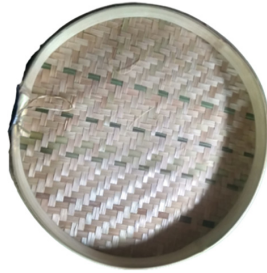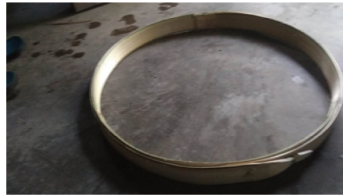**Fig. 2.** Kesseh Surface and Base

Fig. 3. Gheddeng

Fig. 4. Bingkar Gheddeng

B. *Gheddheng*

Gheddheng is a household appliance used to winnow rice and so on. The surface shape of this gheddheng is a circle with a diameter of 60–85 cm (Fig. 3). So that gheddheng can be associated with learning mathematics, namely flat shapes, namely circles. With this, students can learn the area and perimeter of the gheddeng (Fig. 4).

The results of these observations, namely, there are mathematical elements in woven bamboo. The relationship between kesseh and gheddeng with mathematics learning is that kesseh has a cube-shaped surface and base so that it is related to mathematics learning, namely building space and flat wake. While gheddeng has the shape of a circle so that the relation is flat [9].

4   Conclusion

The results of this woven are often used for household furniture such as rice containers, containers for celebrations, cleaning rice, and washing rice called kesseh and gheddheng. In this case, ethnomathematics exist in every tool that is analyzed or researched. The results of these studies can be used in learning mathematics to help students' insight. The concepts obtained are:

1. Kesseh has a circular surface shape and a base that has four legs, so it is related to the concept of flat wake and wake-up space, namely circles and cubes.
2. Gheddheng has the shape of a circle with a diameter and a radius so that it can be associated with the concept of a flat shape, namely a circle.

References

1. sylviyani Hardiarti, "ETNOMATEMATIKA: APLIKASI BANGUN DATAR SEGIEMPAT PADA CANDI MUARO JAMBI," AKSIOMA J. Mat. dan Pendidik. Mat., vol. 8, no. 2, pp. 99–109, Nov. 2017, https://doi.org/10.26877/AKS.V8I2.1707.
2. "[6] Wahyuni , Astri, dkk, 'PERAN ETNOMATEMATIKA DALAM MEMBANGUN KARAKTER BANGSA,' Seminar Nasional Matematika dan Pendidikan Matematika FMIPA UNY, (Yogyakarta, 9 November 2013) - Penelusuran Google."
3. I. Wahyuni, P. Prof, S. Dr., and R. Rahardi, "The students' mathematical thinking ability in solving the program for international student assessment(Pisa) standard questions," J. Adv. Res. Dyn. Control Syst., vol. 11, no. 7, pp. 777–787, 2019.
4. "[1] Febriyanti, Chatarina, dkk, 'ETNOMATEMATIKA PERMAINAN KELERENG,' Jurnal Matematika dan Pembelajaran, Vol. 7, No. 1, (Juni, 2019) - Penelusuran Google."
5. "Eksplorasi Etnomatematika Masyarakat Sidoarjo (Journal) - PDFCOFFEE.COM."
6. I. Wahyuni, "Eksplorasi Etnomatematika Masyarakat Pesisir Selatan Kecamatan Puger Kabupaten Jember," Fenomena, vol. 15, no. 2, pp. 225–238, 2016.
7. "KERAJINAN ANYAMAN BAMBU DI BANJARWARU, NUSAWUNGU, CILACAP, JAWA TENGAH."
8. A. Wahyuni, "ETNOMATEMATIKA DALAM RAGAM HIAS MELAYU."
9. N. sri wahyuni Ibrahim, "Analisis Etnomatematika Pada Kerajinan Anyaman Bambu Terhadap Pemebelajaran Matematika di Kabupaten Sukabumi," J. PEKA (Pendidikan Mat., vol. 4, no. 2, pp. 35–40, Jan. 2021, https://doi.org/10.37150/JP.V4I2.819.