

Ethno-Mathematics In Learning Mathematics On The Material Of The Social Arithmetic In The Tradition Of Malamang In Nagari Ulakanpariaman

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ABSTRACT. This study aimed to describe and to analyze the ethnomatematics in mathematics learning in Malamang tradition in Nagari Ulakan Pariaman. The research method was descriptive method by using observation technique and documentation. Malamang is a community tradition in celebrating the Mawlid of Prophet Muhammad Saw. In this Malamang tradition, Ulakan pariaman community makes lamang, From the discussion above it is proven that in making lamang there is a mathematical material namely social arithmetic.

KEYWORD: Bamboo, sticky rice/ lamang

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I. INTRODUCTION

Ethnomatematics is a form of mathematics that is influenced or based on culture. Therefore, if the development of ethnomatematics has been much studied then it is not impossible that math is taught in a simple way by taking the local culture. Mathematics is a form of culture. Mathematics as a form of culture, in fact has been integrated in all aspects of community life wherever. Ethnomatematic experts argue that basically the development of mathematics until whenever can not be separated from the culture and value that are already exist in society [1].

The ethnomatematics in Balinese craft is the use of the principle of tessellation on woven pattern. Patterns of existing woven on sokasi, tempoh, bodag, lampid, capil, and bedeg use the principle of tessellation. Tessellation uses one type of geometry shape that is rectangle. The pattern of plaiting that is in the tikeh sanggah and tikehflase also use the principle of tessellation. The tessellation also uses one type of square geometry. Because it uses a square geometry, the woven pattern on the sanggah and tikehflase is classified into a regular tessellation. Ethnomatematics in Balinese handicrafts can be used as learning resources in learning, increasing students' insight about the existence of mathematics in one of the elements of their culture, increasing motivation in learning and facilitating students in relating the concepts that is learned with real world situation [2].

The other ethnomatematic form of Ethnomatematic Exploration at Rumah Gadang In South Solok Regency, which is reflected through the various results of mathematical activities held and developed in the South Solok community, includes mathematical concepts on:

1. Carving/ Rumah Gadang motif

- In the south Solok district there is one kenagarian located in Batanghari Subditric namely nagariabai, which its Rumah Gadang has no carving due to the rumahgadang's wall has been replaced by concrete, Rumahgadang which has no carvings in South Solok Regency of 44.44%.
- It is Obtained 34 motifs carved Rumah Gadang or circular line, with motifs such as vines, leafy roots, flowering, and fruiting.
- Motifs of rumahgadang carving are mostly symmetrical. [3, 4]

2. Rumah gadang room

- Most of the existing rumahgadang in South Solok district have rectangular shelters, which have regular platforms and which have multilevel platforms.
- RumahGadang has a room / chamber, because the room / chamber is a place of privacy for the community whether it is married or not, and the number of rooms/ chambers are varies depending on the rumahgadang that is primed and even numbered. [3]

3. Gonjong roof of Rumah Gadang

- Kenagarian in South Solok Regency has various kind of rumahgadang, 62,96% of rumahgadang type are surambiacehbegonjongciek type , 25,93% are maharam elephant manifold house type, 7.41% was gonjongampeksibakbaju. type of gadang home type gown
- For 2 existing kenagarian in South Solok Regency namely NagariSitapui and NagariAbai District SangirBatang Day almost the whole roof shape of rumahgadang is in the formof symmetrical and for the other kanagarianare various
- The number of roofs in the existing kenagarian in South Solok are varies in every nagari, based on the science of Mathematics on Theory of Numbers consisting of even and odd numbers. [3, 5]

While ethnomatematics in West Sumatera in Malamang tradition that occurs in various regions in West Sumatra, especially the area of ulakan pariaman, Malamang tradition is usually done on certain days, such as religious festivals usually perform malamang tradition during the event of the Prophet Mawlid or commemorate the day of death. Malamang means cooking lamang. Lamang itself is a typical food from West Sumatra made from white sticky rice dough and coconut milk put into bamboo. The bamboo was previously covered with banana leaves and then roasted over the coals.

Ethnomathematics

In etimology, "ethno" is defined as something very broad that refers to the socio-cultural context, including language, yell, codes of behavior, myths, and symbols. The basic wordof "mathema" tends to mean explaining, knowing, understanding, and performing activities such as coding, measuring, classifying, summarizing and modeling. Suffix "tics" is derived from techne and means the same as technique [6]. Thus, as a result of the cultural history of mathematics can have different forms and develop in accordance with the development of the wearer community.

Mathematics as a Cultural Product

Mathematics grows and develops in different parts of the world, not just in one location or region only. Mathematics also arise and grow in the territory of India, America, Arab, China, Europe, even Indonesia and also other areas. Growth and development of mathematics occur because of the challenges of life faced by humans in various regions with different cultural backgrounds. As Sembiring revealed that mathematics is the construction of human culture [7].

Culture

In the Big Indonesian Dictionary (1996), it is mentioned that culture is the mind, reason, cultural custom is the result of human activity and creation (mind), such as belief, art and custom [6]. According to sociologists interpret the culture with the overall skills (custom, morals, art, science etc.), while historians interpret the culture as a heritage or tradition. Even anthropologists see culture as a lifestyle, way of life, and behavior [6].

Culture is something that can not be avoided in daily life, because culture is anunity intact and comprehensive that prevails in a community. Tylor defined culture as the whole of human activity, including knowledge, belief, art, morals, law, customs, and other habits [8]. Meanwhile, according to anthropology, culture is the whole syrod of ideas, actions, and the work of human beings in the framework of the life of society which is made human self by learning [9].

Malamang

Malamang for the people of West Sumatra is a tradition. This tradition is usually done on certain days, such as religious holidays or commemorating the day of death. For example, the people of Pariaman West Sumatra, usually carry the Malamang tradition at the time of the Prophet Muhammad SAW Mawlid. Based on the information collected, this tradition was born not separated from the role of Sheikh Burhanuddin, Ulama from Pariaman. At that time Sheikh Burhanuddin traveled to the coastal area of Minangkabau to spread the religion of Islam, especially in Ulakan, Pariaman [10, 11].

According to Tambo (narrated narrative of the origin and past events that occurred in Minangkabau), then Sheikh Burhanuddin diligently visited the homes of the people to stay in touch and teach the religion of

Islam. By the residents, he is often treated to food. However, it seems that Sheikh Burhanuddin is rather doubtful about the halal food served. He also suggested to every community he visited in order to find bamboo, then the base with young banana leaves. White glutinous rice and coconut milk then put into it, then roasted on a firewood stove [10].

In the Malamang tradition there are mathematics learning materials namely: 1) Determining the Volume of Tubes; 2) Social Arithmetic; and 3) Determining Angles. However, in this paper only discussed about the Social Arithmetic This study aimed to describe and analyze the ethnomatematics in mathematics learning at night tradition in NagariUlakanPariaman.

II. EXPERIMENTAL METHOD

The research method was descriptive method [11] by using observation technique and documentation. The subject of this research was Malamang tradition which is located in Lapau pen area, NagariUlakan, UlakanTapakisPariamanSubdistrict. In this study the researchers collected data by performing observations, documentation and experiments in the manufacture of lelang, with various shapes of diameter, size and length of reed. In data processing and data analysis the researcher tried to give meaning of each data obtained for it then data processing and data analysis and inference

III. RESULT AND DISCUSSION

In Malamng tradition there is a mathematical education on linear program material and social arithmetic. In cooking lelang there are ingredients and tools needed namely sticky rice, coconut milk, salt, garlic, banana leaf and reed. Although in the Malamang tradition the community work together in donating materials and tools, but there is a cost that the community spends in carrying out the traidisi when donating tools and materials.

Question :Padatradisimalamang yang dilaksanakandikenagarianulakanparimandibutuhkanberasketansebanyak 9 liter, santankelapa 9 liter, garam 1,5 bungkus, bawangputih 1 ons, daunpisang 3 ikatdanbuluh 15 buah. DenganhargaberasketanRp 12.000,00/liter, hargasantanRp 12.000,00/liter, 1 bungkusgaramRp 2.000,00, bawangputihRp 4.000/ons, danhargabuluh 1 buahRp 5.000,00, daunpisangRp 2.000/Ikat, tentukan a) berapa total biayakeseluruhandalampembuatanlelang, b) berapahargasatuanbatangbuluh, c) apabilahargasatuandijualRp 35.000/batangbuluh, berapakeuntungan yang didapatkan. In Malamang tradition which is performed in Kanagarianulakanpariman required 9 liters of sticky rice, 9 of coconut milk liters, 1.5 packs of salt, 1 ounce of garlic, 3 bunches of banana leaf and 15 reeds. With the price of sticky rice Rp 12.000,00 / liter, coconut milk Rp 12.000,00 / liter, 1 pack of salt Rp 2.000,00, garlic Rp 4000 / ounce, and the price of reed 1 fruit Rp 5.000,00, banana leaf Rp 2.000 / Tie, specify a) what is the total cost of making of the lamang, b) what is the price of the reed bar, c) if the unit price is sold Rp 35.000 / reed rod, how much profit is earned.

Known:

For example :

Sticky rice = bk

Coconut milk = s

salt = g

garlic = bp

banana leaf = dp

reed = b

Price: 1 liter of BkRp 12.000,00,

1 liter of s Rp 12.000,00

1 pack of gRp 2.000,00

1 ounce of bp Rp4.000,00

1 bunch of dpRp 2.000,00

1 rod of bRp 5.000,00


Asked : a) How much total cost in making Lamang ?


b) How much unit cost of reed rod ?


c) If it is sold Rp35.000/ reed rod, how much the profit earned ?

Answer:


a) How much total cost in making Lamang ?

Bk = 9 liter,  9 liter x Rp 12,000.00 = Rp 108,000.00

s = 9 liter,  9 liter of coconut milk x Rp 12.000,00 = Rp 108.000,00

g = 1,5packs,  1,5 packs of salt x Rp 2,000.00 = Rp 3,000.00

bp = 1 ounce,  1ounce = Rp4,000.00

dp = 3 bunches,  3 bunches of banana leaf x Rp 2,000.00 = Rp 6,000.00

$$\begin{aligned}
 b = 15 \text{ pieces} & \longrightarrow 15 \text{ pieces of reed} \times \text{Rp } 5,000.00 = 75,000.00 \\
 bk &= \text{Rp } 108,000.00 \\
 s &= \text{Rp } 108,000.00 \\
 g &= \text{Rp } 3,000.00 \\
 bp &= \text{Rp } 4,000.00 \\
 dp &= \text{Rp } 6,000.00
 \end{aligned}$$

$$\begin{aligned}
 b &= \text{Rp } 75,000.00 + \\
 \text{Total} &= \text{Rp } 304,000.00
 \end{aligned}$$

So total cost in making Lamang in Malamang tradition is Rp 304.000,00

b) How much unit cost of reed rod ?

The number of reeds used as many as 15 reed rods that are considered the overall diameter is almost the same, then $\text{Rp } 304.000 : 15 \text{ rods} = \text{Rp } 20.266,67$. So the unit price for 1 rod of reed is $\text{Rp } 20,266.67 \cong \text{Rp } 20,300.00$.

c) If the unit price is sold Rp 35.000 / reed rod, how much profit and percentage of profit earned ?

Selling price of 1 stem of reed Rp 35.000,00 then for 15 stems reed = $15 \times \text{Rp } 35.000,00$ is Rp 525.000,00.

$$\begin{aligned}
 \text{Profit} &= \text{selling price} - \text{buying price} \\
 &= \text{Rp } 525.000,00 - \text{Rp } 304.000,00 \\
 &= \text{Rp } 221.000
 \end{aligned}$$

$$\begin{aligned}
 \% \text{ profit} &= \frac{\text{profit}}{\text{buying price}} \times 100\% \\
 \% \text{ profit} &= \frac{\text{Rp } 221,000.00}{\text{Rp } 304,000.00} \times 100\%
 \end{aligned}$$

$$\% \text{ profit} = 0,72697 \times 100\%$$

$$\% \text{ profit} = 72,697 \% \cong 72,7 \%$$

72,7% So the profit is in the amount of Rp 221.000,00 with a percentage of profit of 72.7%



Figure 1. Results of Lamang

From the solution of the problem above, it can be concluded that the total cost in making lamang at Malamang tradition which contains 9 liters of sticky rice, 9 liters of coconut milk, 1.5 packs of salt, 1 ounce of garlic, 3 bunches of banana leaf resulted 15 reeds containing lamang equal to Rp 304,000.00. From the price of 15 reeds obtained unit price for 1 rod of reed containing lamang which is about Rp 20.300,00.

If we sell 1 rod of reed containing lamang with the price of Rp 35.000,00 then we get the selling price of 15 rods of reed that is Rp 525.000,00 So the profit that can be from the sale of 15 stems of reed is Rp 221.000,00 with the percentage of profit of 72.7%.

From the discussion above it is proven that in making lamang there is a mathematical material namely social arithmetic. Ethnomatics uses widespread mathematical concepts related to various mathematical activities, including grouping activities, arithmetic, measuring, designing buildings or tools, playing, locating, and so on. Malamang activities alone are usually done together with the division of tasks namely bamboo seekers as a place of dough, firewood search for baking, preparation on ingredients to make lemang, and others. Usually lemang is made in large quantities and served for a snack in the event of the Prophet's Mawlidin surau [12].

IV. CONCLUSION

In the Malamang tradition in Ulakan Pariaman there is mathematics learning on the social arithmetic.

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