THE ETHNOMATEMATICS ASPECTS OF BANJAR CULTURE IN BALANGAN DISTRICT OF SOUTH KALIMANTAN

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Abstract

Culture-based education has a vital role as an incentive for individuals and communities to achieve in all areas of life. The purpose of this research was to describe how mathematics exists in the culture of Banjar society. The subjects of this research was two resource persons who had deep knowladge about sociology and anthropology that exist in Balangan district. The object of this research is the ethnomatematics aspects found in the Banjar community.This research used qualitative research that was intended to explore the ethnomatematics found in Banjar culture. Data obtained from this research was in the form of interviews of Subject 1 and Subject 2. The results of the analysis showed that there are many material of mathematics that exist in Banjar culture, such as physical culture including some tools traditional agriculture and non-physical artefacts such as how to measure the land area and suggestions for further research that can be use to develop the etnomatematics that have discover into a mathematics learning package.

Keywords: ethnomatematics, Banjar society, culture.

Introduction

Curriculum 2013 aims to prepare Indonesian people to have the ability to be better live as individuals and citizens who are faithful, productive, creative, innovative, and affective and able to contribute to the life of society, nation, state, and world civilization. Education is rooted in the culture of the nation to build the life of the nation today and the future. This view makes the 2013 Curriculum developed based on the diverse Indonesian nation culture, directed to build a life of the present, and to build the foundation for a better nation life in the future

In its own learning Curriculum 2013 emphasizes the observation of concrete problems that are problems that can be imagined by students eg using examples of the environment in which they are located, of course every different place in Java and Kalimantan Island is of course different,

then should use culture which is in place so it becomes real for learners. Then to the semi-concrete here is a bridge between the real world and the world of mathematics, and finally the abstraction of the problem. Therefore mathematical concepts need to be taught by considering local aspects that develop in the community around the environment of learners.

Taking into account the surrounding environment or the local culture of the child resulting in assimilation between mathematics and their lives. The first step that needs to be done, and become the focus in this research is to explore - the investigation of elements of community culture that contains mathematical concepts. Exploration results will be used as a basis in the development of mathematics teaching materials.

Cultural values that are the basis of the character of the nation is an important thing to be instilled in every individual, for that the value of this culture should be instilled early on so that each individual can better understand, interpret, and appreciate and realize the importance of cultural values in carrying out every activity of life. Cultivation of cultural values can be done through the family environment, education, and within the community of course. Preservation of local culture and the development of national culture through education both formal and non-formal education, using all containers and educational activities. Education and culture is something that can not be separated in everyday life, because culture is a unified whole, prevails in a society and education are fundamental needed for every individual in society.

The inclusion of mathematics consciously or unconsciously into various aspects of life would be interesting to study, whether the study in economic, political, social, cultural, or other aspects. One of the interesting aspects studied is the cultural aspect. In human culture, mathematics generally penetrates into the culture but humans rarely realize that mathematics has penetrated their culture. Therefore, the study of mathematics in culture needs to be developed so as to give

an idea to the cultured society about the role of mathematics in its culture. Based on the description of the background of the problem then the problem posed in this research is what mathematics materials exist in the culture of Banjar community with the aim of Describe the mathematical material that exist in Banjar culture.

Theory

A. Banjar Society

The anthropologists, historians, and cultural of Banjars has disagree on the origin of the Banjar ethnic. According to Djantera Kawi (2011: 4), there are several opinions about the Banjar tribe. First, Banjar people come from mainland Southeast Asia. Secondly, Banjar people are native to the island of Borneo. However, there is a tendency to say that Banjar are ethnic Malayo-Polynesian, and the origin of Banjar people is from Champa (Thailand), Vietnam, Cambodia and Southeast Asia. They migrated to Kalimantan through several periods because the island is very sparsely populated and to seek fertile areas for agriculture, as well as to build a new government.

B. Culture

Soelaiman Soemardi & Selo Soemardjan (1964) explains that a culture is a fruit or a work of creation & sense of society. A culture does have a very close relationship with the existing developments in society. Lehman, Himstreet, and Batty (1996) define culture as a collection of some life experiences that exist in a particular group of people. Life experience in question can be a belief, behavior, and lifestyle of a community.

Parsudi Suparian (1999) says culture will base all behavior in society, because culture is a human knowledge that is entirely used to understand and understand the environment

& experience that happened to him. According Koentjaraningrat, (1985) also explains that the notion of culture is a system of ideas and feelings, an action and work produced by humans in the life of society, which made it his own by learning.

From some of these definitions, can be obtained understanding of culture is something that will affect the level of knowledge that includes ideas contained in the human mind, so as to create habits in everyday life, the culture is abstract. While the embodiment of culture is the objects created by humans as being cultured, in the form of behavior and objects that are real, such as patterns of behavior, language, equipment life, social organization, religion, art, etc. all of which are intended to help human beings in the life of society.

From the two definitions above it can be concluded that Banjar culture is a habit, behavior and way of thinking in everyday life and objects that are real in the community of Banjar and the work of the community itself such as cooking tools, agricultural equipment, buildings in particular that occupy the area of South Kalimantan.

C. Ethnomatics

The ethnomatmatic notion described by D'ambrosio in (Rosa & Orey, 2011: 35) says that "The term 'ethnomathematics' has been used by D'Ambrosio (1985) to mean" the mathematical practices of identifiable cultural groups and may be regarded as the study of mathematical ideas found in any culture ".

Ethnomathematics was introduced by D'Ambrosio, a Brazilian mathematician in 1977. Ethnomatmatic definitions by D'Ambrosio in ethnomatic terms are defined as: mathematics practiced among identified cultural groups such as national tribal societies,

labor groups, children of certain age groups and classes professional "(D'Ambrosio, 1985) .The definition of ethnomatematics has a broader sense of ethno (ethnic), then ethnomatematics is defined as a cultural anthropology of mathematics from mathematics and mathematics education. defined as maths practiced by cultural groups, such as urban and rural communities, labor groups, children of certain age groups, indigenous peoples, and others.

Methodology

The type of this research is qualitative descriptive research. The purpose of this study is to reveal facts, circumstances, phenomena, variables and circumstances that occur when the study goes and serve what it is. Qualitative descriptive research interprets and discloses data pertinent to the current situation, attitudes and views that occur in society, the contradictions of two or more circumstances, relationships between variables, differences between facts, the effect on a condition, and others. the problems studied and investigated by qualitative descriptive research refers to quantitative studies, comparative studies, and can also be a correlational study of one element along with other elements. Usually this research activities include data collection, data analysis, meginterprestasi data, and ends with a conclusion that refers to the analysis of the data. The purpose of qualitative research here is to construct a histotic complex picture, analyze words, report informant views in detail, and conduct studies in a natural setting.

The subject is two expert informants who know about the culture of Banjar community namely Yunita Fazarwati, S.Pd and Riska Damayanti, S.Pd. While the object in the research is the ethnomatematics that exist in the culture of banjar society. This research was conducted in Balangan Regency of South Kalimantan Province and development was done in Balangan Regency South Kalimantan Province in the Year 2016/2017.

The research instrument is a tool or facility used to collect data to make the work easier and the result is better in a more thorough, complete, and systematic meaning for easy processing, (Arikunto, 2006: 160). Instruments in this study include: The main instrument used in this study is the researcher itself so that researchers must be "validated". Validation of researchers, including; understanding of qualitative research methods, mastery of insight into the field under study, readiness of researchers to enter the object of research-both academically and logically (Sugiono, 2011); Observation, the purpose of observation is done, among others, by finding information about the aspects of ethnomatematics that have been found and then linking them to school learning; Questionnaires, questionnaires were given to the expert ie lecturers from mathematics education and math subject teachers (beta and product test). The data will illustrate in detail the quality of packets that are validated by the expert

Data collection methods used in this study about ethnomatematics in the culture of banjar society are: Observation, is one of the data collection techniques in any research including qualitative research, and used to obtain information or data as the purpose of research; Interviews conducted on two expert speakers from the banja community, here selected teacher of sociology and anthropology as an expert; Document Analysis, Document analysis method is also done to collect data in the form of ethnomatematic information that exist in banjar society culture. The meaning of the document here refers to books, articles, scientific papers, archives or other similar documents that may be used as supplementary informants as part of case studies where the main data source is participant observation or interview; Documentation, research results from observation will be more credible or reliable if supported photographs, writings, or works of the respondents who researched. However, the documents used must be documents that reflect the actual state of the document not made for a particular interest.

Data analysis techniques used in qualitative research focused on ethnography using inductive analysis. Inductive is the thought process that begins with one or several phenomena to make a conclusion (inference). Here all phenomena must be researched and evaluated before proceeding further into the inductive thinking process, the reasoning process also known as the scientific thinking process.

Results and Discussion

On 2003 of February, the Establishment of Balangan Regency in South Kalimantan Province. Broadly speaking Balangan Regency has two majority tribes, namely the tribe of Banjar and Dayak tribe. The Banjar tribe here is mostly Islamic, while the Dayak tribe has a diversity of trust evenly among them mostly embrace Christianity and Buddhism but among the elderly the election of religion is only as a formality in other words as a marker there is a belief in identity, can be called animism and the dynamism or religion of the ancestors or commonly called kaharingan religion. But now most of the young people have a lot of professed religions recognized in Indonesia in earnest, such as Buddhism and Hinduism.

A. Borongan: system on ground measurement

Square of area is a common unit used to declare land area in Banjar community especially *"Hulu Sungai*" area. The unit area is defined as 10 fathom × 10 fathom or 100 square depots. Based on the results of interviews with some people who know about the culture in Balangan District that the height ≈ length of human or with almost the same size. While one fathom is 170 cm or 1.7 meters in size based on the results of one fathom size interviews obtained from the size of people who are not too high and that is not too low in the area. This deal lasted for generations aims to equalize the size, because it is

feared that short-bodied people will lose money when buying land and people with high stakes benefit.

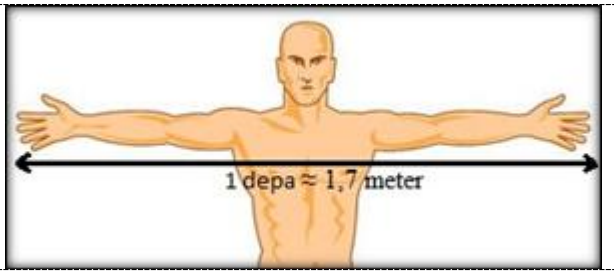

Figure 1. Simulation, comparison of one fathom with meter

So the conversion of one "borongan" into the international system is

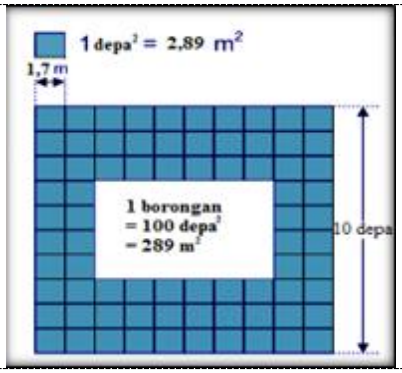

Figure 2. Conversion of one "borongan" into international system (meter)

Table 1. Wide comparison

Unit	International measurement system
1 fathom²	2,89 m²
1 borongan	289 m²
35 borongan	1 ha dan 115 m² atau 10.115 m²

The hectare unit was more widely used in Indonesia than the square kilometers (km²) units to express the agrarian extent. Often one hectare of land in the Banjar community was agreed on 35 pieces of land. 1 ha ≈ 35 *borongan* .

B. Ethnomatics on “balogo” game

Balogo is one of the traditional game types of Banjar tribe in South Kalimantan. Balogo game name taken from the word logo, which is to play by using the logo tool. The game of Balogo was well known in 1980 to 2000, at that time almost every child knew it. This game is done by children up to teenagers and generally played by men with the number of players 2 to 6 people.

Logo made of coconut shell material with the size of the diameter of about 5-7 cm and thickness between 1-2 cm. The shape of this logo tool is diverse, there are shaped *bidawang* (river crabs), triangle, shape of kites, and leaves. In the game must be assisted by a tool called *panapak* or sometimes some areas have called it with *campa*, the sticks or hitters that are about 40 cm long with a width of 2 cm. The function of the *panapak* or *campa* for hit the logo to slide and knock down the logo of the opponent installed while playing.

This balogo game can be done one on one or team. If played in a team, then the number of players who "up" (who do the game) must be equal to the number of players who "pairs" (players whose logo is installed to be torn down) The number of team players at least 2 people and a maximum of 6 people. Thus the number of logos played as many as the number of players agreed in the game

How to install this logo is established lined back on transverse lines. Therefore the core of this balogo game is the skill of playing the logo in order to knock down the opponent's logo. The team that most can knock down the opponent's logo, they are the winners. As the end of the game, the losing party is required to hold the winning player.

Figure 3. Shape Logo

Figure 4. Shape of Logo Stics (*Panapak*)

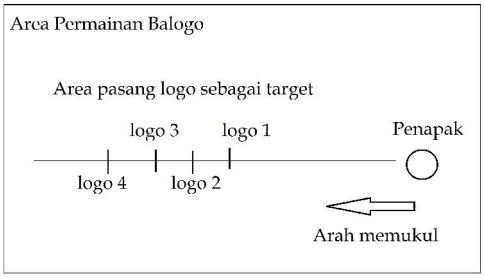

Figure 5. Balogo game area

The cultural values contained in the balogo game are skill, hard work, cooperation, and sportsmanship. Balogo games require special skills to knock down the logo of an opposing player. Then the cooperation is needed to knock down the opponent's logo, and the sportman gained from the losing player is required to hold the winning player because the rules are so.

C. Ethnomathematics on the hats (tanggui) Banjar society

In this section can be seen examples of typical hats Banjar community called Tanggui to protect from the sun light because in the southern part of Kalimantan the weather is quite hot and protect from rain. Can be seen on the hat has the concept of a circle. Tanggui is the traditional cap / head cap from Banjar Society.

Tanggui is usually used by farmers, farmers or peddlers selling on the river. The rigidity of the toll is no different from the hat is usually to protect the head from the scorching sun. The typical hat of this Banjar Society is a parabolic craft of woven *nipah* leaf. The nipah leaves are still young in the sun until wilted so strong, then formed into a parabola and given a booster on the edge. Nipah itself is a kind of palm (palma) that grows in the environment of mangrove forests or tridal areas.

Figure 6. tanggui

Figure 7. tanggui are used from the farmer

D. Nyiru

In this section can be seen the traditional handicrafts found in Malay culture including the culture of the Banjar community. "Nyiru" this tool is usually used as a winnowing rice to separate the good grain and less good. The winnowing tools also have the concept of a circle. There is little difference between nyiru in South Kalimantan and in Java, in Kalimantan which is used as a ring-shaped retainer is rattan wood, while many are found in Java using bamboo as well.

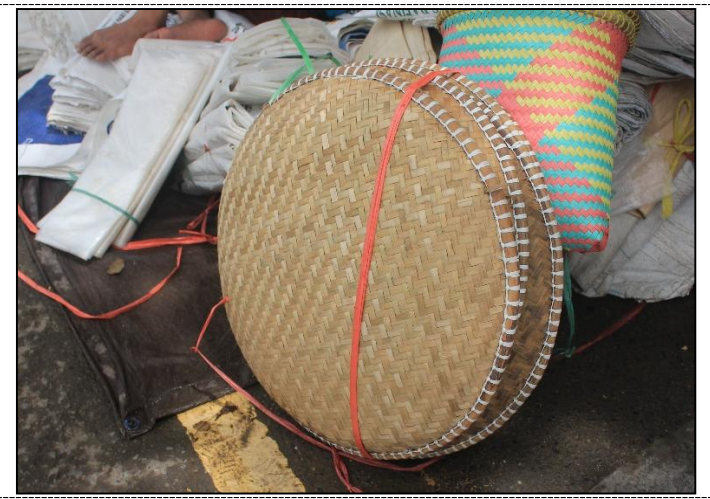

Figure 8. Nyiru

E. Bakul

Ethnomatics in Banjar culture are also found in traditional "bakul" tools, used by people in their daily lives. Bakul are usually used to harvest fruits are also used to harvest the results of rubber society. The process of making “bakul”. Provide *purun* plant. And selected the leaves to be dried, selected a good plant to be used as a basket. weigh the plant as much as 1 kg. Flatten the plant by pounding. Giving color to taste. Weaving with lift method 2. Make a basket strap with lift method 2 and tidy it up. Sew the edges with rope rope to neatly.

Figure 9. Bakul

Tabel 3. Culture that suitable for learn material in the school

No	**Culture**	Mathematical Activity Culture	Matched Matter Material for scholl
1	**“Borongan” system on the sale and purchase of land**	Memperkirakan ukuran tanah dengan menggunakan manusia Estimating the size of one fathom human depth	Comparison: Scale Rectangular: • Area and circumference

		Comparison:	
2	**Balogo game**	-	Rectangular: • Kites
3	**Tanggui**	-	Circle
4	**Nyiru**	-	Circle
5	**Bakul**	-	Circle Tube

Conclusion

Based on the results of data analysis obtained from this study, it can be concluded that a lot of mathematical material that exist in the culture of banjar society, such as in the comparative material, rectangle, line and angle, wake up space, build side curved space, congruent, similarity, and circle. Ethnomatematics that is more expressed in this research is a physical ethnomatematics that is the traditional tools commonly used in the daily life of Banjar people, especially for farming and farming.

For school teachers especially in South Kalimantan area, it is suggested to use mathematic learning product that developed as one of mathematics learning which is expected to stimulate the process of solving mathematical problems especially the use of local culture. The implementation of mathematics learning in schools should always be tailored and based on the curriculum set by the Government, but taking into account the use of local culture as a learning context.

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