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Sundanese Ethnomatemics Learning in Improving Mathematical Literacy Ability of Elementary School Students

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Abstract. Mathematical literacy is an important part of mathematical abilities that must be developed. At the end of 2016, Indonesia appreciated the achievement of the Program for International Student Assessment (PISA) value which increased significantly by 22.1 points. In the test, mathematical literacy experienced a good increase of 11 points. But, it is still considered low compared to other countries. The purpose of this review literature is to analyze Sundanese Ethnomatematics Learning in improving mathematical literacy skills. This article discusses in detail 1) sundanese ethnomatemics learning 2) mathematical literacy skills.

Keywords: Ethnomathematics, Ethnomathematics Learning Sundanesse, Mathematical Literacy

INTRODUCTION ~The age of knowledge (knowledge age) with the acceleration of an extraordinary increase, is a very pronounced impact in the world of education (Rahman, Sopandi, & Syaodih, 2018) . This requires literacy skills that must be developed in the world of education. It is not only literacy in the form of reading in language skills which is a narrow definition. However, there are several literacies that must be developed, namely: numeracy literacy, scientific literacy, financial literacy, cultural literacy, and digital literacy (Rahman, Sopandi, & Syaodih, 2018) .

Indonesia's literacy rate ranked 60th out of 61 countries through statistical data *from the United Nations Educational, Scientific, and Cultural Organization* (UNESCO) in 2017 where Finland ranked first in the literacy level which did not reach 100% (Rahman, Sopandi, & Syaodih , 2018) .

Starting in 2000 the government included its students in international tests namely the *Program for International for Student Assessment* (PISA) *and Trends in International Mathematics and Science Study* (TIMSS) (Mirza, 2017). At the end of 2016, Indonesia appreciated the achievement of a significantly increased *Program for International Student Assessment* (PISA) value of 22.1 points, increasing Indonesia's achievement in 2015 was enough to provide optimism, although it was still low compared to the OECD average (Kemdikbud, 2016) .

The achievement of mathematics learning nowadays does not only equip students with the ability to remember formulas and calculate learning as usual. However, what is expected in learning mathematics today is how students are able to compete in the industrial field that is able to involve the ability to reason, be critical and be able to analyze for problem solving in everyday life. The application in learning mathematics about daily life is outlined in the story problem, where students still have difficulty reading comprehension, *Problems of reading comprehension*

requires personal interpretation, critical and creative thinking, drawing conclusions, establishing connections to reading, requiring answers or responses of information through paraphrases are listed in the text (Nirmala, Rahman, & Musthafa, 2018) . Mathematical reasoning ability at the elementary school level is still relatively low, this is one of the causes of literacy ability that has not developed rapidly. The views of students in general who still consider mathematics is a science of counting and routine problems, which makes students do not connect between concepts in solving problems found in everyday life. To improve students' mathematical literacy skills (Susanti & Syam, 2017) argues that to overcome these problems is the teacher because the teacher is an agent as a learner who must play an active role to build a positive view of students towards learning mathematics.

The cause of literacy is still low the other is because the learning process is still using the traditional learning process, namely lectures. Minister of Education and Culture (Mendikbud) Muhadjir Effendy rate, there needs to be an alternative method of learning mathematics. Because according to him, mathematics subjects are still considered difficult and frightening for students (Hermawan, 2018) . Therefore, to improve students' literacy skills by using innovative learning methods. At present there are many learning models that can be utilized for the development of students' mathematical abilities. However, as an independent national identity, we do not always have to be oriented and imitate everything that is found by Western countries, so it should be a teacher who continues to want to find a method of learning, especially mathematics, as well as love for local culture that is owned in order to remain sustainable, then not It is not possible if mathematics learning is presented with the regional culture in the archipelago to improve the expected mathematical abilities . It is not only mathematical abilities that will increase but also students' love for culture increases. This is in line with ethnomatematics learning where students can learn mathematics by involving culture. Culture-based learning can be divided into three types, as Goldberg argues (Supriadi, 2014) namely culture-based learning can be divided into three types, namely learning about culture, learning with culture, and learning through culture .

According to *D'Ambrosio* (Hasanuddin, 2017) " *Ethnomathematics is the mathematics practiced by cultural groups, such as urban and rural communities, groups of workers, professional classes, children in a given age group, indigenous societies, and so many other groups that are identified by the objectives and traditions common to these groups* . " So ethnomatematics is mathematics that can be practiced in certain cultural groups and can also be practiced in professional classes. With ethnomatematics learning, it is expected that literacy skills will increase by packaging learning in such a way.

The hope to improve literacy skills is in line with curriculum content standards in 2013. Core competencies The skill domain for each subject is processing, presenting, and reasoning in the realm of concrete (using, extracting, stringing, modifying, and creating) and abstract domains (writing, reading , counting, drawing, and writing) in accordance with what is learned in school and other sources that are the same in the perspective / theory (Novita Sari, 2015)

So based on the description above, the purpose of this article is to explore how Sundanese ethnomatematics learning implementation improves mathematical literacy skills in elementary school students.

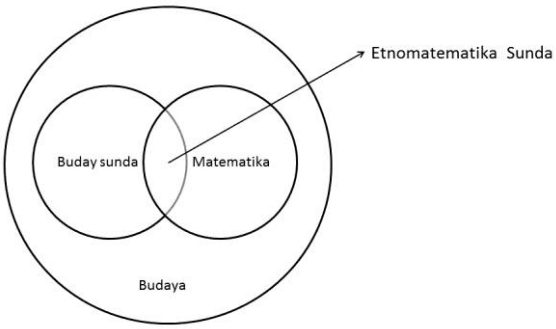
Sundanese Ethnomatemics Learning

Ethnomatematics is learning that involves environmental culture with mathematics as a reality that must be explained, Emmanuel in (Supriadi, Suryadi, Sumarmo, & Rachmat, 2014) argues that "ethnomatematics is an approach used to explain the reality of the relationship between environmental culture and mathematics when teaching ".

Culture is not only art which is the main benchmark, but the activities of daily life, Bishop in (Hartoyo, 2012) said that " Mathematics is essentially growing from the skills or activities of the cultural environment" .

Sundanese ethnomatematics learning process occurs mathematics learning accompanied by Sundanese cultural inheritance. The concept of ethnomat ematics Sunda according to (Supriadi, Suryadi, Sumarmo, & Rachmat, 2014) are all activities of one's ideas and ideas based on Sundanese cultural views (Sundanese cultural values) developed through mathematical thought processes, by looking at mathematics as a product culture.

Sundanese ethnomatematics is one of the concepts of learning mathematics based on culture. Mathematics is the result of human thought, therefore mathematics is considered a cultural product. Ethnomatematics according to (Hasanuddin, 2017) Mathematics is seen as a result of human reason, in addition it is also considered as a result of the abstraction of the human mind. Sundanese ethnomatematics learning is Sundanese culture which is involved in the process of learning mathematics. Sundanese philosophy methods, media, and values can be used in learning Sundanese ethnomatematics. (Supriadi, 2014) illustrates it like the diagram below:



Konsep Etnomatematika Sunda (Supriadi, 2014)

Components in Sundanese ethnomatematics learning (Supriadi, Developing Modeling Ability and Disposition and Mathematical Creative Thinking of PGSD Students through Ethnomatatics-Based Contextual Learning, 2014) include:

a. Constructivism (*Constructivism*), namely students construct or build their own knowledge and give meaning through real experience.
b. Ask (*Questioning*), the students gather information, to confirm what was already known, and mengarahan aspects were not yet known.
c. Search (*inquiry*), namely knowledge and skills are the results of finding themselves not the result of remembering facts.
d. Learning together (*learning community*), ie students learn in small heterogeneous groups ..
e. Modeling (*modeling*), namely learning skills or knowledge with a particular model. Students who can solve problems can be displayed as models in learning.
f. Reflection (*reflection*), which is a way of thinking that expresses something from the learning experience to respond to new things.

Ethnomatematic learning has learning steps, so that learning is carried out to the fullest. The steps of learning Sundanese ethnomatematics (PES) described by (Supriadi, 2016) are as follows:

a. Preliminary activities
   1) The teacher conveys Sundanese ethnomatemics learning, the rules of the game, the assignments to be given, and their assessment.
   2) The teacher gives apperception by asking oral questions to students to explore initial abilities related to mathematical concepts to be learned.
b. Core activities
   1) The teacher forms groups of 4-5 people.
   2) The teacher gives LKS to each student with a problem of Sundanese cultural context which will be discussed.
   3) One student reads a cultural problem in a worksheet and another student pays attention.

4) The teacher asks students things that are not understood by students related to the questions in the worksheet that will be done.
5) Students understand the material in the worksheet before discussing it with other group members.
6) Students later n solve the problem independently. The results are then discussed with his group friends.
7) The teacher provides assistance to groups who have difficulty when students solve problems in LKS.
8) The results of student work in groups are then interpreted in front of the class. Each group presents their work in rotation.
9) When a student writes their work on the board, group members and other groups pay attention and compare with their work.
10) The teacher asks other groups to write their answers on the board if they differ from the answers that have been presented, then the teacher leads the class discussion.
11) Other groups respond to what is presented, help answer if needed, and add answers. The presenter group responds and answers questions from students or from other groups.
12) During the discussion, the teacher acts as a facilitator and moderator of the discussion so that students can find and construct their knowledge related to the problem being studied.
13) The teacher and students do reflection, which is analyzing and re-examining the process of mathematical learning activities that have been presented.
14) If the mathematical understanding process is correct, the teacher then asks questions to students.
15) The final result of the discussion is the equalization of students' perceptions of the concepts contained in the problem discussed so that it can be applied to solve practice questions.

c. Closing Activity
1) The teacher *reviews* the mathematical concepts that have been learned.
2) The teacher always reminds students about the importance of preserving and preserving Sundanese cultural values in everyday life and the importance of learning mathematics with Sundanese culture.

3) The teacher provides information about the next learning material and conveys that at the next meeting will always be given questions to do in groups and one of the group members will appear to the front of the class. For that, every must prepare themselves.
4) The teacher gives practice questions to do at home individually. Homework results are collected, assessed and returned to students.

Mathematical Literacy

Literacy is the ability to identify, understand, interpret, create, communicate, calculate and use written material related to various contexts. Literacy is a way to convey meaning and take meaning from the form of representation (Abdussakir, 2018) . The notion of mathematical literacy is also stated that mathematical literacy is the ability to explore, guess, and reason logically, and to use various mathematical methods effectively to solve problems (Larasatry, Mustiani, & Pratini, 2018). Literacy ability is now very important amid the increasingly rapid development of education, especially in everyday life.

Mathematical Literacy is *Individuals's capacity to formulate, employ, and interpret mathematics in variety of contexts. It includes mathematical reasoning and using mathematical concepts, procedures, facts, and tools to describe, explain and predict phenomena*. What it means is one's ability to formulate, use, and interpret mathematics in various contexts. This includes mathematical understanding and using mathematical concepts, procedures, facts, and tools to describe, explain, and predict phenomena. Mathematical literacy focuses on reasoning, thinking, and interpretation (Rozien, 2017).

Understanding mathematical literacy implies that not only mastery of the material must be developed but the use of reasoning, concepts, facts and mathematical problem solving in everyday life. The term mathematics literacy had previously been coined by NCTM (1989) as one of the visions of mathematics education that is to become literate in mathematics. In this vision mathematical literacy is defined as " *an individual's ability to explore, to conjecture, and to reason logically as well as to use variety of mathematical methods effectively to solve problems. By becoming literate, their mathematical power should develop*" (Novita Sari, 2015)

Conclusions

Mathematical literacy is a mathematical ability that aims so that students can apply learning in everyday life, especially in today's industry competition. To develop mathematical literacy of students there are several ways that must be considered,

namely from the teacher and the learning model. Teachers who are important agents in developing education must play an active role so that existing education can be maximally developed so that students no longer learn mathematics just to understand concepts, but how this learning of mathematics can be applied in everyday life.

The learning model found in the world of education currently adopts many of the learning models that are applied in western learning. However, to develop students' love for the archipelago, educators must think about learning models that can maintain the nation's culture. Mathematics learning can foster national cultural love, one of which is Sundanese ethnomatematics learning, because this learning is expected to be able to improve students' mathematical literacy abilities.

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