The students' mathematics understanding through ethnomathematics based on kejei dance

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Abstract. The study aims to describe the understanding of mathematics of junior high school students through ethnomathematics based on kejei dance from Rejang Lebong District. The method used is exploration studies. Students selected by purposive sampling technique as a sample. This research instrument is a mathematical understanding interview sheet. The results showed that based on kejei dance, students could build geometry. They have geometry skills through the following activities: identifying and making examples and examples of rejection of flat buildings found in kejei dance. Subjects are able to use models and symbols to represent the concept of building flat on kejei dance.

1. Introduction

The mathematics lessons are one important lesson because the material learned is useful for everyday life. Especially in an age that is as sophisticated as today, students are required to be able to master the field of mathematical knowledge [1]. Mastery of mathematics requires an understanding of concepts in the form of a theorem or formula. Understanding this mathematical concept is one of the fundamental goals in the learning process and one of the objectives of the material delivered by the teacher [2]. According to Widada and Herawaty mathematical understanding of each material taught by the teacher is important to be owned by each student because it helps the process of remembering in working on math problems that require many formulas [3].

The implementation of mathematics learning in schools, the process carried out still does not meet expectations [4]. Students still have difficulties in solving problems related to the ability of mathematical understanding. Middle school students who are given the question "How much is 8 × 12?" Can answer it with answer 96. But if given a follow-up question "Explain why 8 × 12 = 96?", Not necessarily the student can explain it. This is because, for the first question only routine procedures are needed to answer them. Whereas for the second question it is necessary to have sufficient understanding of the problem to be able to answer it.

Mathematical understanding is a basic competence in learning mathematics which includes the ability to absorb a material, remember mathematical formulas and concepts and apply them in simple cases or in similar cases, estimate the truth of a statement and apply formulas and theorems in solving problems [5]. This mathematical understanding is very needed in solving mathematical problems because the problem can only be solved if the understanding of the intent and concept will be used [2].

The learning process of students in the implementation is not much involved in constructing their knowledge, just accepting the information delivered in the direction of the teacher [6]. Often students
are not able to answer different questions from the examples given by the teacher, follow the example, and do the exercises following the pattern given by the teacher, not because students understand the concept. Because of the importance of the ability of mathematical understanding mastered by students. To develop the ability to understand mathematics learning, the teacher must strive for learning by using learning models that can provide opportunities and encourage students to exercise students' mathematical understanding skills [7].

Teachers in pursuing meaningful mathematics learning can use the cultural background possessed by students so that students learn more about mathematics in accordance with reality [8]. The form of mathematics that is influenced or based on culture is ethnomathematics. Whereas in terms of ethnology mathematics is defined as the mathematics practiced among identified cultural groups such as national tribal communities, labor groups, children of certain age groups and professional classes [9].

Therefore, ethnomathematics is the right learning approach. Local culture is the starting point for horizontal mathematical processes [1,3]. This will make it easier for him to find mathematical concepts [2]. Kejei Dance is a Rejang Lebong culture that is close to students' lives [10,11]. They can easily use the dance to build basic mathematical concepts [4], and math understanding. Mathematical understanding is a basic competence in learning mathematics which includes the ability to absorb a material, remember mathematical formulas and concepts and apply them in simple cases or in similar cases, estimate the truth of a statement and apply formulas and theorems in solving problems [5]. Thus, we discuss students' thinking processes in understanding mathematics through Kejei Dance.

2. Method
The research was an exploration studies. Students are selected by purposive sampling technique as a subject. The subject is a junior high school student in Rejang Lebong Regency. This research instrument is a mathematical understanding interview sheet.

The first step is to study literature on books, journals, and research that discusses students' mathematical understanding, and the ethnomatics contained in Kejei Rejang Lebong Dance. Furthermore, the data obtained from this literature study will be used to describe the mathematical understanding of Kejei Rejang Lebong Dance Ethnic Mathematics-Middle School students.

3. Results and discussion
Based on exposure to data from interviews with research subjects, analyzed qualitatively, and can be presented below. The indicators that have been selected are applied to questions that are ethnomatics oriented to the dance of Kejei Rejang Lebong. The ethnomatics of the Rejang Lebong community in the form of various results of mathematical activities owned or developed in the Rejang Lebong community, including mathematical concepts can be grouped in kejie rejang lebong dance. Kejei Dance is a traditional dance found in Rejang Regency which is usually displayed at a wedding ceremony which is defined as the release of the bride and groom. According to data, the concept of Kejei dance ethnomatics consists of:

- The concept of a flat building consists of a flat, rectangular, circular rectangle with an ellipse and triangle.
- The concept of the nature of the line consists of parallel and perpendicular lines.
- The concept of transformation consists of rotation and reflection.

Based on the indicators that have been explained then, as for the grid and mathematical comprehension test items, the ethnomathematics oriented to the Kejei Rejang Lebong dance consists of: Kejei Dance is a traditional dance found in Rejang Lebong Regency. Kejei comes from the Rejang language which means a big work or celebration. Kejei dance is held by one family for traditional wedding ceremonies, whose implementation is assisted by the surrounding community. Kejei dance is a dance of male and female pairs, dance Kejei served at the marriage ceremony in a custom undecided pawpaw (wedding reception) is at the peak of the wedding reception, the bride and groom to participate in this dance, as a symbol of the single release of the bride and groom. The movements of the Kejei dance consist of:
• The worship movement with the female and male dancers lined up
• Broken paddle movement is the movement of movement to the next movement.
• Movement against the waist.
• The dancers walking around the penei exchanged places, the male dancers entered the arena of the female dancer.
• The eagle's movements are blown away.
• Inviting movement.

Indicators of mathematical understanding of ethno-mathematically oriented dance Kejei: Defining the concept of flat build on kejei dance verbally and in writing.

Question Item:
At Kejei dance there is a worship movement where when both hands are clenched, as in the figure 1.

See Figure 1. (a) and (b). The hand movements on this prayer dance form a flat kite. Define a kite based on the movement?

Indicators of mathematical understanding of ethno-mathematically oriented dance Kejei: Identify and make examples and examples of flat building denials found in the kejei dance.
Question Item: Consider the following *kejei* dance movements:

| Worship movement | Worship movement | Which of the sling on the side that forms a triangular flat shape? Explain! |
|------------------|------------------|-----------------------------------------------------------------------------|
| ![Worship movement](image1) | ![Worship movement](image2) | ![Which of the sling](image3) |

**Figure 2.** Triangles and kites based on the *kejei* dance movement.

Based on Figure 2, indicators of mathematical understanding of ethno-mathematically oriented dance *Kejei*: Using models and symbols to represent a concept of flat build on *kejei* dance.

Question Item:

**Figure 3.** The prayer movement of *Kejei* dance (male and female).

*Kejei* dance after the prayer movement, the dancers walked around the penei to exchange places, the male dancers entered the arena of the female dancer (see Figure 3).

Subjects transformed the *kejei* dance movement to understand mathematical concepts. Students do this through implementation and decapitating prior knowledge in the form of mathematical schemes in long term memory. Students use their own language in solving problems. *Kejei* dance is used as a basis for students to build geometrical objects. When students are asked to solve problems based on *kejei* dance, students have geometry skills to identify and make examples and not examples of flat buildings found in *kejei* dance. At the same time, the subject is able to use models and symbols to represent the concept of building flat on *kejei* dance. The results of this study support the study [12], that the ethnomathematics as a means to improve students' mathematical performance, which in turn will revolutionize their social mobility abilities. Educators are responsible for the learning process, which
includes developing curriculum and learning strategies based on the integration of cultural elements and values, and especially ethnomathematical games, in mathematics.

According to Widada the process of mathematization by students is a process of abstraction by using the off model in the form of banana leaves to achieve the integral concept [1, 4]. This shows that the application of realistic mathematics learning model based on ethnomathematics can help students in the process of abstraction, idealization and generalization by using off and model for [1, 13, 14].

Based on the cognitive process, subjects can change the form of representation to build flat into another form. Students are able to make various meanings and interpretations of the concept of flat buildings. They are able to identify the characteristics and recognize conditions that determine the concept of flat building contained in kejei dance. Finally, students are able to build a geometry structure based on kejei dance.

4. Conclusion
The results showed that based on kejei dance, students could understand mathematics through the re-application of knowledge obtained in the form of formulas or mathematical concepts by using their own language in solving problems. The mathematical concept applied to kejei dance is to build geometry. Students have geometry skills through the following activities: identifying and making examples and examples of flat-building denials found in kejei dance. They are able to use models and symbols to represent a concept of flat build on kejei dance. Subjects can change a form of representation to build flat into another form. Students are able to make various meanings and interpretations of the concept of flat building. They are able to identify traits and recognize the conditions that determine a concept of flat build contained in the kejei dance. Also, students compare and differentiate a concept of flat build on kejei dance.

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