Students’ responses on ethnomathematics based learning with the context of Kayuagung community

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Abstract. This research belongs to the type of qualitative research with ethnographic design, which aims to find out the mathematical ideas contained in the innate ritual or the conveyance of the people of Kayuagung, Ogan Komering Ilir district called oban yadikon rasan. And to find out learning using the context of the oban yadikon rasan. The subjects in this study were resource persons who had knowledge about the wooden yadikon oban yadikon and IX grade students in SMP Negeri 2 Kayuagung. This research generates mathematical ideas to build dimensional space 3, which corresponds to junior high school students, namely the material to construct curved side spaces in class IX. After learning by using these mathematical ideas, students in class IX.1 as the subject of this study conclude that learning is more interesting and increases students' interest in learning mathematics. Thus ethnomathematics-based learning with the context of oban yadikon rasan agung for junior high school students, received a positive response that is more interesting and increased student interest in learning.

1. Introduction
Mathematics learning has a close relationship with the context in real life. Mathematics has an important role in everyday life, with the function of mathematics as a suggestion of thinking logically, systematically, and consistently in determining and developing science and technology in order to face future challenges in global competition [1]. It is also one of the backgrounds in the 2013 curriculum changes, especially in mathematics learning, which must relate to everyday life or contextual learning with the hope that every student has the skills needed to face this increasingly advanced life. In every learning process requires positive responses from students to see their interest in learning. Where the meaning of the response itself. The response comes from the word "response", which means the answer, reply or response (reaction) [2]. More clearly the psychological response is the muscular process that arises as a result of stimulation in the form of answers or behaviors that can be seen or hidden from each individual [3]. Thus the response between students and teachers in the learning process is needed.

In theory it has also been stated that learning requires the formation of responses, in line with the opinion [4] which says that learning makes changes in behavior based on learning experiences. In other words, learning requires input in the form of stimulus and response in the form of [5]. As the results of research conducted [6] states that in general students feel interested, happy, and easy to understand learning by using realistic mathematics.

In general, students feel interested, happy and easy to understand when learning mathematics with a realistic approach [7]. This supports ethnomathematics based learning more effectively when compared to conventional approaches [8, 9]. Learning mathematics can improve students' abilities, motivation, interests and confidence [8].
Mathematics is not just a collection of numbers, symbols and formulas that have nothing to do with the real world. Instead, mathematics grows and develop in the real world. The history of mathematics also provides knowledge of how mathematical concepts develop. Mathematical history explain how al-Khwarizmi a scientist introduced a zero that had been challenged to exist, but as the development of the zero ground is now one of the number used in binary numbers which are used also in computer programming.

Knowledge obtained through the history of mathematics is very useful for use in learning [10], [11] underlies research related to mathematics teacher perceptions of the application of mathematical history with three key assumptions, namely: (1) mathematical history provides a foundation for a deep understanding of the evolution of mathematical concepts; (2) understanding why and how mathematical concepts were developed over the years with hard work; (3) learning the history of mathematics can increase interest and develop students' positive attitudes towards mathematics. Thus the expected history of mathematics opens the way to increase interest and develop abilities that are expected according to the needs of the times, as stated in the Ministry of Education Regulation All content must be adjusted.

In the process of making paper, it is necessary to discuss the objectives. But the reality in the field that most students experience difficulties applying mathematics in their daily lives caused by mathematics learning developed by teachers, where the real world is only used as a place to apply concepts not as tools and sources for learning mathematical knowledge [12]. This is the initial cause of the difficulty of students learning mathematics, namely mathematics felt less meaningful. Secondly in mathematics learning, generally there are still many conventional learning processes so that students are not seen active, saturate, and do not provide concrete meaning and experience from the learning passed [13].

Thus we need an innovation in learning that continues to develop along with the rapid development of knowledge and technology today. The presence of innovation in learning, especially mathematics is very necessary so that learning mathematics can become more fun and meaningful [14]. Learning innovation is also related to things that are concrete and related to the daily experience of students can be used as an interesting learning resource. One aspect that can be developed for these learning innovations is the local culture that can be applied with culture-based education [15].

With culture-based education as an innovation in learning, the aspect that can be taken is the local culture. According to [13] because culture can be associated with mathematical concepts or can be used as a medium for learning mathematics. In addition, learning like this can foster a sense of love for the local cultures that exist in their environment. A growing love is also able to give positive things for students as a form of nationalism of students. Culture-based learning is a strategy for creating learning environments and planning learning experiences that integrate culture as part of the learning process [15, 16]. The process of practicing mathematical concepts in learning with local cultural wisdom is commonly called ethnomathematics. Ethnomathematics is a science that is used to understand how mathematics is adapted from a culture [13].

This ethnomathematics-based mathematics learning innovation has seen some results from previous studies conducted by [17] that children's cognitive competence in problem solving and communication through contextual learning where the statistical potential is better than compared to learning that uses direct learning (formal). According to [18] one of the learning approaches that occupies the application of mathematical concepts as an important aspect in mathematical learning that uses problems by linking them in everyday or realistic life is Indonesian Realistic Mathematics Education (PMRI).

PMRI is an adaptation of Realistic Mathematics Education (RME) where mathematics learning is a human activity and mathematics must be significantly linked to the context of students' daily lives as a source of development and as an application area through mathematical processes both horizontal and vertical [19, 20]. Thus the facilities in the form of PMRI approach in ethnomathematics-based learning become a good step to apply cultural values to mathematics learning.

In this case, it is well known that local culture is what makes Indonesia different from other countries. This is what must be maintained, because the progress of a culture depends on the way the culture is introduced and utilized in its human resources. The application of ethnomathematics in local culture, in learning mathematics can reduce people's perception of the lack of relationship between mathematics...
and everyday life. Applying the surrounding culture can be a starting point for learning mathematics, so ethnomathematics can be a component component of mathematics education [20].

South Sumatra is part of the Batang Hari Sembilan cultural area, for the reason that the culture in the region is adapted to nine large and long river flows in the region including the Komering, Musi, Lematang, Enim and Ogan rivers [21]. South Sumatra itself consists of several tribes that occupy each part of the region in South Sumatra, can be seen in terms of the language that is owned, a variety of regional languages that are owned, reflecting that South Sumatra is a miniature of the diversity of languages owned by the Indonesian state.

Various tribes occupy parts of the region from South Sumatra, one of them is the Komering Tribe, as the name implies it occupies an area around the Komering river. The many tribes in the South Sumatra region, carrying the many customs that are formed from various regions, one of which is the city of Kayuagung which is a sub-district of Ogan Komering Ilir (OKI) district has an interesting marriage culture, namely Oban Yadikon Rasan culture.

Each culture has its own values and meanings, this is what underlies the study of values, in Oban Yadikon rasan in Kayuagung society that is examined for examination into ethnomathematics-based learning. One of them is the property that is used in Oban Yadikon rasan which has different forms and uses, based on the study above research using mathematical ideas contained in oban yadikon rasan into mathematics learning at junior high level as well as seeing students' responses to the learning done.

2. Method
Qualitative research is a process of natural inquiry that seeks a deep understanding of social phenomena in their natural settings [22]. This research is classified into a type of qualitative research, which has ethnographic design that aims to find out the mathematical ideas contained in the wooden cornflower and students' responses to the implementation of ethnomathematics-based learning mathematics with these mathematical ideas. With 3 (three) research procedures in qualitative research in general, namely: (1) Preparation stage; (2) Implementation phase; and (3) Data analysis stage. The research subjects included informants or informants who knew the culture of Oban Yadikon Rasan and students of State Junior High School 2 Kayuagung to conduct the mathematics learning process based on ethnomathematics. Interviews were conducted on the subject of informants or informants who were in the city of Kayuagung, to find out about the culture of Oban Yadikon Rasan Kayuagung community as well as property observation. While the semi-structured interview on students of SMP Negeri 2 Kayuagung, to find out the students' responses to the learning that is carried out is ethnomathematics based learning with the context of oban yadikon rasan. With field notes add documentation and video to the research process. The data analysis technique was carried out according to the type of research that is Triangulation (Reducing, Medisplay and Concluding) [23].

3. Result and Discussion
Based on the results of interviews conducted with Mr. Yusrizal as Ogan Komering Ilir (OKI) cultural observers and observations conducted at the House of Mr. Yusrizal as Ogan Komering Ilir (OKI) cultural observers. ). For the properties used in Oban Yadikon Rasan Kayuagung's culture, with the results shown below. Figure 1 shows the properties of tinong which have the use of "tinong used to carry sponge cakes and the like which are brought to the bride as a main dish in oban yadikon rasan" Said Pak Yusrizal. Figure 2 shows the properties of tanduk which have the use of "tanduk used to carry staples such as wheat, rice, eggs and so on, which will later be given to the bride's relatives and about them as an invitation to the person "said Mr. Yusrizal. Figure 3 shows the property of kaleng gondang which has the use of being called Yusrizal" kaleng gondang are used to carry pastries, crackers and typical kemplang kayuagung served to the bride's small family.
**Figure 1.** Tinong (Has a Tubular Shape with a lid on it, which is made of aluminum and painted in a typical style of Kayuagung)

**Figure 2.** Tanduk (Has a conical shape at the top with a support at the bottom, made of woven and painted in a typical style of Kayuagung)

**Figure 3.** Kaleng Gondang (Has a Tubular Shape with a lid on top and on the side as if it has ears, made of aluminum and painted in a typical style of Kayuagung)
Concluded that the mathematical ideas contained in oban yadikon rasan include tinong, tanduk and kaleng gondang containing the concept of three dimensional space. By looking at building three-dimensional spaces for junior high school students, there is a curved side chamber in the tube and cone in class IX. This is in accordance with research [24] which takes the concept of fractions in the Malay Malay Riau carving patterns, because there is a motif part at a distance, and fractions have been studied at the elementary level. Based on the mathematical ideas obtained from the results of the thesis, ethnomathematics-based learning is carried out in the context of the students who are in class IX of SMP Negeri 2 Kayuagung. The class chosen is class IX.1 consisting of 28 students divided into 5 groups, where there are 3 (three) groups consisting of 6 members and (two) other groups consisting of 5 members.

The learning process was carried out during 2 meetings, in which the ethnomathematics-based learning process with the context of oban yadikon rasan, researchers used a student worksheet (LKPD) which contained the Oban Yadikon context which was used as Apperception. Seen from Figure 4 shows the LKPD used in learning.

![Figure 4](image)

**Figure 4.** Student Worksheets (LKPD) used for ethnomathematics-based learning in the context of oban yadikon rasan kayuagung

In LKPD activities there are activities that guide students to find the shape of the curved side space contained in the property used in oban yadikon rasan namely tinong, tanduk and kaleng gondang. Figure 3 shows the results of students in finding the shape of the curved side space, the tube, which is on the tinong and kaleng gondang properties. Thus it appears that students are able to find and rewrite information previously observed.
After finding students, the next problem is determining the surface area of the curved side space illustrated. Figure 6 shows the results of students in determining the surface area of the curved side space in the picture, which is a tube chamber.

From the work of students completing activities in LKPD it is seen that participants are easy to understand and are able to solve problems related to the context of *Oban Yadikon Rasan*. After doing ethnomathematics-based learning with the context of *oban yadikon rasan* Kayuagung in class IX.1 SMP Negeri 2 Kayuagung as many as 2 meetings, then the questionnaire was conducted to see students' responses to the learning process that had been conducted during 2 meetings. The questionnaire contained as many as 10 statements which were divided into 4 responses namely strongly agree, agree, disagree and strongly disagree. His statement is a positive statement that aims to see whether students are interested or not interested in learning.

Table 1 shows the alternative answers along with the scores given, for all questionnaire statements because this study is classified as a positive statement.
Table 1. Scoring Answers

| Scale of Answers | Value |
|------------------|-------|
| Strongly Disagree| 1     |
| Disagree         | 2     |
| Agree            | 3     |
| Strongly agree   | 4     |

Table 2 shows the range of score intervals on students’ answers to the questionnaire statement given.

Table 2. Range of Interval Scores

| Category    | Score         |
|-------------|---------------|
| Very good   | 32.5 - 40     |
| Good        | 25-32.49      |
| Not good    | 17.5-24.99    |
| Very Poor   | 10-17.49      |

Based on the questionnaire data that has been managed, the results obtained from 28 students are 10 students in the good category and 18 students in the very good category. So it can be concluded that the responses of students to positive statements towards the learning process of mathematics based on ethnomathematics that have been done are positive. Thus students of class IX.1 have an interest in learning mathematics based on ethno-mathematics with the context of oban yadikon rasan. To strengthen the results of the data obtained from the questionnaire researchers conducted interviews.

Interviews were conducted with representatives from each group taken, each group representative expressed a good response from a number of questions posed for the learning process carried out such as the interview except as follows "learning that is fun and has a new impression, the perceived difference from normal learning is clearly more interesting because learning becomes easy to understand it is related to culture, especially wood culture itself "according to Ihwanul representatives from group 1. "The student worksheet (LKPD) is very helpful with the information provided so that learning is easy to understand and more interesting for knowing mathematics can be linked to the rich culture itself," said the Bima group representative two. According to group representative titin 3 "Learning is done to help recognize the culture around (Kayuagung) which is incorporated into mathematics learning, giving a new impression to assist in learning mathematics”.

Based on the results of interviews with students of grade IX.1 SMP Negeri 2 Kayuagung, it can be seen that ethnomathematics-based mathematics learning with the context of the Oban Yadikon Rasan has a positive impact both in helping mathematics learning, getting to know culture and having a more exciting impression than usual learning. The enthusiasm of students in ethnomathematics based learning shows that the surrounding culture in this case one of Kayuagung's cultures can be used as mathematics learning which makes students' interest in learning in mathematics better. Thus based on the results of the questionnaire and student interviews produced that students' responses to the learning conducted, have an interest and make students’ interests different from the usual learning.

4. Conclusion
Based on the results of research conducted it can be concluded that 1) The mathematical idea contained in Oban Yadikon Rasan kayuagung is to build a three dimensional space precisely in the wake of the curved tube and conical side spaces, 2) The learning that is carried out using mathematical ideas in learning mathematics based on ethnomathematics with the context of oban yadikon rasan kayu which is conducted on grade IX.1 students in SMP Negeri 2 Kayuagung using the Student Worksheet (LKPD) with finding activities, and 3) from the results of questionnaire analysis and interviews conducted that show good response results in helping students learn mathematics, as well as an interest in knowing culture so as to make students' interests in learning mathematics better.
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