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Research Article

The Role of Ethnomatematics Based on Traditional Engklek Games in Improving the Ability of Understanding Mathematical Concepts SD Muhammadiyah Sipirok

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Abstract.

This study aims to determine the effectiveness of the role of ethnomatematics based on traditional crank game in increasing the ability of students to understand mathematical concepts at SD MuhammadiyahSipirok and their responses to learning. This type of research is qualitative research. The learning model developed is a type of traditional game where elementary school students will be more enthusiastic about learning mathematics, especially in flat shape material where the concepts used will improve students' understanding of mathematical concepts. From the results of the analysis of observations during the learning process and the results of interviews conducted by comparing the tcount and ttable values that the calculated value is greater than the table value and the results of the questionnaire students' responses to learning with the use of ethnomatematics based on traditional crank games are already in the very happy category because each None of the students scored 30 below or obtained half the expected maximum score of 60 where all students were above 30. The results of the research will be the type of flat shape in the crank game, the problem of the suitability of the crank game with the flat shape material and its understanding, the flat shape is used as contextual learning.

Keywords: Ethnomatematics; traditional games; Muhammadiyah; contextual learning

1. Introduction

Education is an interaction between the factors involved in it in order to achieve educational goals. The interaction of these factors can clearly be witnessed in the learning process, namely when educators teach values, knowledge, and skills to students, while students receive the teaching[1]. The target of the educational process is not just the intellectual development of students by supplying as much knowledge as possible, more than that, education is a process of giving understanding, understanding, and

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appreciation to the practice it knows. Likewise with cultural education, where culture is defined as the entire system of thinking, values, morals, norms and beliefs of humans produced by society[2]. Culture is defined as all things related to culture. In this context, cultural review is seen from three aspects, namely (1) universal culture, which is related to universal values that apply anywhere that develops in line with the development of community life and science or technology, (2) national culture, namely the values apply in Indonesian society nationally, (3) local culture that exists in the life of the local community[3].

Mathematics is an integrated science. Looking at mathematics as a whole is very important in learning and thinking about the connections between topics in mathematics. So that in conveying a concept B, for example, a teacher must first introduce or pay attention to concept A. However, the fact is that currently learning proponents such as existing teaching materials have not been able to facilitate students in linking or connecting one concept to another[5]. Learning models like this make students feel bored when learning mathematics. If the problem is not resolved immediately, then mathematics will always be a scourge for students. Elementary school students who are in the concrete phase and during play need a touch of real mathematics material.Mathematics is an abstract and deductive science, mathematics is a method of logical thinking. Mathematics is a science that studies the relationships of patterns, shapes and structures and mathematics is the queen of knowledge and is the servant of other sciences[4]. besides that mathematics is one of the subjects that can be used as a medium to preserve culture and develop the character of the Indonesian nation. According to Sriyono (2010) The development of national culture and character can only be carried out in an educational process that does not release students from the social, cultural and cultural environment of the nation[4].

Traditional games are one of the activities that are fun and close to children, in this case elementary school students[6]. Traditional games are activities that are entertaining in nature using simple tools and without tools that have been passed down from generation to generation. Traidisonal games provide good benefits for children's development both physically, emotionally and cognitively. Iswinarti (2010) who examined the Engklek game. This study used a qualitative approach, while the data collection techniques were through observation and interviews with children who were asked to play cranks. The results showed that the therapeutic values contained in the traditional Engklek games included: (1) Value as a detection tool to identify children with problems. (2) Value for good physical development. (3) Score for good mental health, (4) Value for problem solving, (5) Score for social[6]. Likewise with the results of research by Sahara and Fitri

(2018) where the implementation of mathematics learning at SD MuhammadiyahSipirok is still abstract, especially on geometric material. Students do not understand the concept of learning geometry so that their interest in learning mathematics, especially geometry, is less attractive. According to Marpaung (2002), understanding mathematics is more meaningful if it is built by students themselves and not in a forced state. This means that mathematical concepts and logics are not given by memorization or must follow the algorithm given by the teacher[7]. That view is not wrong at all, both are correct and in accordance with the development of mathematics itself.

Another consideration is that the mathematics obtained at school does not match the way of life of the local community so that mathematics is difficult for students to understand because there are two schemes obtained, namely the scheme obtained in the environment and the scheme obtained at school. Ethnomatematics is a complex and dynamic representation that illustrates the cultural influence of the use of mathematics in its application. Ethnomatematics raises cultural wisdom so that it can motivate students in learning mathematics. In learning mathematics, there are several abilities that affect student achievement[8]. The mathematical aspects of this game are as follows: 1) Introduction to numbers and practicing arithmetic. 2) Introduction to flat shapes found in lumpak or cranks or crank houses above the ground. Engklek is a game in which there are elements of flat geometry which, if further examined, can also be applied in learning mathematics about geometry[9].

Thus it is important to empower the community and the school to use ethnomatematics in the traditional crank game at SD MuhammadiyahSipirok. As for the problem in this research is how to raise awareness of the importance of the ethnomathematic approach in traditional children's games to bridge the needs of students in understanding geometry material in SD Muhammadiyah Sipirok

2. Methods

This research uses a qualitative approach. In obtaining the required data, researchers mingle with the subject, observation, interviews, and documentation. The data obtained were analyzed using scientific thinking methods, namely describing, connecting, and comparing findings in the field.

Data collection techniques used in this study were to use test sheets and questionnaire sheets. Where the test is used to measure the ability of students to understand mathematical concepts consisting of a pre-test and post-test. Meanwhile, student

questionnaire sheets were used to measure student responses related to the use of ethnomatematics based on traditional crank games.

3. Results and Discussion

Following are the results of the research obtained based on the implementation of the research which will be described based on the formulation of the existing problems:

3.1. The role of ethnomatematics based on the traditional crank game can improve the students' ability to understand mathematical concepts at SD MuhammadiyahSipirok

From the distribution table / group above, it was found that the students' mastery of the learningmaterial was still classified as sufficient and had not yet met the KKM success rate of 70, because the number of students who obtained completeness was around 14 people and this can be seen in the value intervals of 66 - 73 and 74 - 80 students. So that as a group the students' ability to understand mathematical concepts has not reached the KKM of 70. For more details, it can be seen in the following diagram:

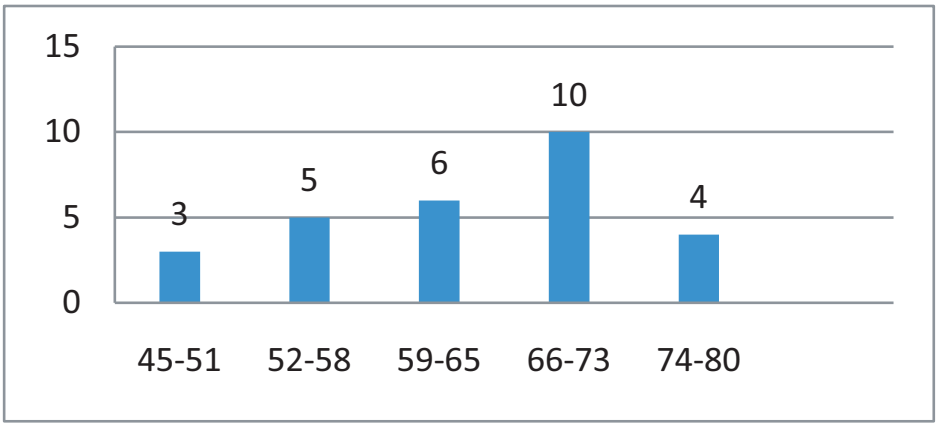

Figure 1: Frequency Distribution of Concept Understanding Ability Tests.

Based on diagram 1, it can be seen that students who have reached the KKM score of 70 are in the interval 66-73 to 74-80 with a total of 14 people.For more details, it can be seen in the following diagram:

Based on diagram 2, it can be seen that all students have reached the KKM score of 70 with a total of 28 people.

To make it easier to make decisions, first formulate a hypothesis, namely:

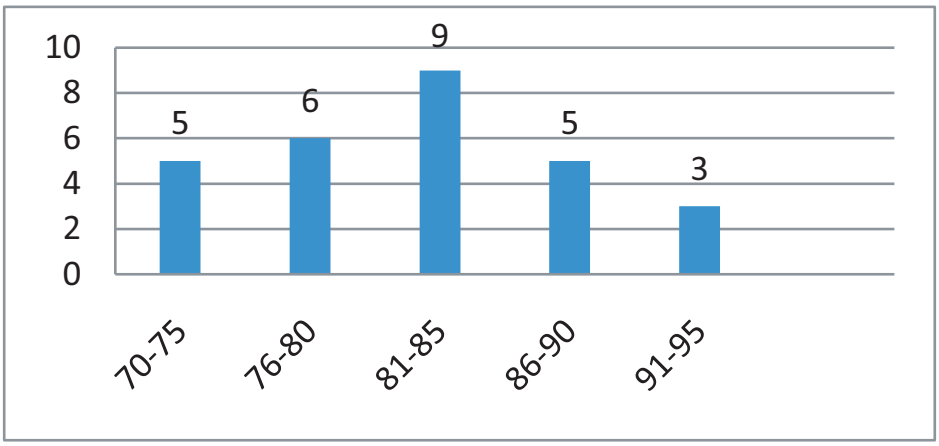

Figure 2: Frequency Distribution of Concept Understanding Ability Tests.

Ha: The role of ethnomatematics based on the traditional crank game can improve the students' ability to understand mathematical concepts at SD MuhammadiyahSipirok.

H0: The role of ethnomathematics based on traditional crank game cannot improve the students' ability to understand mathematical concepts at SD MuhammadiyahSipirok

Based on the questionnaire that was given at the end of the meeting with the use of ethnomatematics based on the traditional crank game, the data distribution was obtained as follows: For more details, see the following diagram:

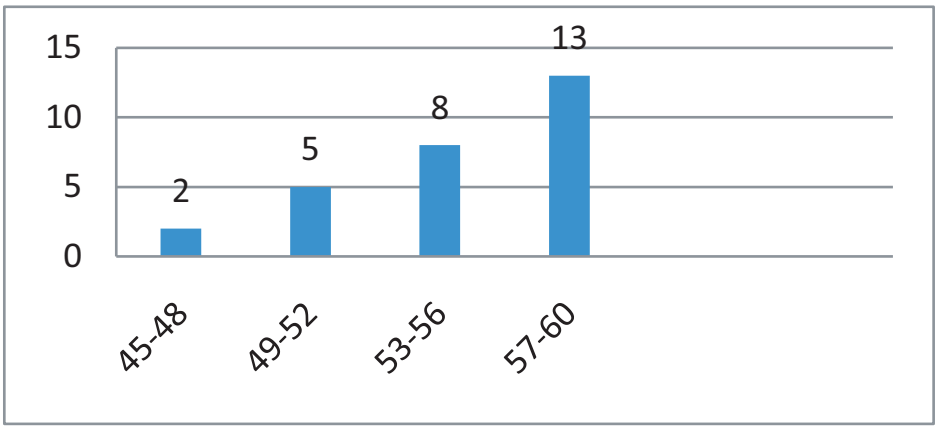

Figure 3: Frequency Distribution of Ethnomathematic. Questionnaires based on the traditional crank game.

Based on diagram 6.3, it can be seen that students who have reached more than half of the maximum score of 60 are 28 students who have scored more than a score of 30.

Based on the results of research on the first problem formulation on the role of ethnomatematics based on traditional crank game, it can improve the students' ability to

understand mathematical concepts at SD MuhammadiyahSipirok. By comparing the pre-test data with the post-test the students' ability to understand mathematical concepts, the analysis obtained tcount = 18.85. Then comparing with t table with α = 0.05 with dk = n - 1 = 27 obtained t table = 2.052. Based on the results of the analysis that has been obtained, it is obtained tcount>ttable, then Ha is accepted and H0 is rejected, the conclusion is that the role of ethnomatematics based on traditional crank games can improve the students' ability to understand mathematical concepts at SD MuhammadiyahSipirok so based on this analysis it is very good that ethnomatematics be applied to children. children at the elementary level to reintroduce the existing culture.

Furthermore, to analyze the second problem formulation on the role of ethnomatematics based on traditional crank game, it can affect the ability of students to understand mathematical concepts at SD MuhammadiyahSipirok. Namely, by comparing the student response questionnaire with the results of the student's post test, it is obtained rcount = 0.765. Then comparing with rtabel with α = 0.05 with dk = N = 28, it was obtained r table = 0.374. Based on the results of the analysis that has been obtained, it is obtained rcount>rtabel, then Ha is accepted and H0 is rejected, the conclusion is that the role of ethnomatematics based on the traditional crank game can affect the ability of students to understand mathematical concepts at SD MuhammadiyahSipirok then the interpretation of the correlation coefficient is very strong. Based on the relationship that occurs, it can be said that ethno-mathematics is very good to be applied in improving students' mathematical abilities.

4. Conclusions

The role of ethnomatematics based on the traditional crank game can improve students' ability to understand mathematical concepts at SD MuhammadiyahSipirok. It is indicated that tcount>ttable is 18.85> 2.052, so Ha is accepted and H0 is rejected. The role of ethno-mathematics based on the traditional crank game can affect the ability of students to understand mathematical concepts at SD MuhammadiyahSipirok with a very strong category. This is indicated by rcount>rtable, namely 0.765> 0.374, so Ha is accepted and H0 is rejected.

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