

Research article

The Implementation of Distance and Comparison Concepts Into Traditional Marbles Games in Elementary School

Muhammad Syarwa Sangila^{1*}, Muhammad Ilham², Samrin Samrin¹, Sri Anandari Safaria¹, Imaludin Agus¹, and Yuslianti Yuslianti¹

¹Department of Mathematics, Faculty of Teacher Training Education, Institut Agama Islam Negeri Kendari, Kendari-Indonesia.

²Department of Primary Education, Faculty of Teacher Training Education, Institut Agama Islam Negeri Kendari, Kendari-Indonesia.

ORCID

Muhammad Syarwa Sangila: <https://orcid.org/0000-0003-2179-0446>

Abstract.

This research examined the implementation of using the concepts of distance and velocity in relation to traditional marbles games. The purpose of this study was to determine the ability of students to implement the concepts they had learned in school into the traditional marbles game. Data collection was through observations, tests, interviews and documentation from informants who understood the rules of playing marbles. Triangulation was used to check the validity of the data. The results showed that 75% of the students were able to implement the concepts of distance and speed in relation to the traditional kereleng game but were unable to implement the mathematical ability test questions. The percentage of students who obtained high, medium and low scores in completing the mathematical ability test was 33%, 25% and 42%, respectively.

Keywords: distance, speed, comparison, traditional games, marbles

1. Introduction

Mathematics and culture are two things that are closely related. But sometimes mathematics is seen as something that is not connected to everyday life. Whereas in teaching formal mathematics (school mathematics), teachers should start by exploring informal mathematics knowledge that students have obtained from the life of the community around their place of residence. The environment can be a source of math problems in real life. Mathematics in culture is known as ethnomatematics .

It is undeniable that the influence of modernization has a close relationship with today's life, so that modernization has an impact on the fading of the nation's cultural values. However, globalization in the end cannot be denied, but must be faced. In the world of education the impact of globalization needs to be analyzed in order

Corresponding Author:
 Muhammad Syarwa Sangila;
 email: syarwa1990@gmail.com

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to create strategic anticipatory policies by creating education based on local cultural values. In other words, education today should include cultural elements in developing learning tools Mathematics learning must have a clear output. The purpose of learning mathematics based on the curriculum is to understand concepts and apply concepts or algorithms, in a flexible, accurate, efficient, and precise way to solve problems

Mathematics learning in the 2013 curriculum is expected to equip students with various competencies in terms of attitudes, knowledge, and skills that are in accordance with the times so that students can contribute positively to society, the nation and the country. However, the success of this learning depends on the creativity of the teacher in designing learning that is interesting, fun, and challenges the curiosity of students. In this case the teacher plays his role as a planner, implementer, and curriculum development for the class even though the teacher does not spark concepts about curriculum [1], [2],[1]

Ethnomatematics as a form of mathematics learning approach and research approach that is in direct contact with national culture are expected to be an alternative to introduce national identity to students so that as the nation's successor, students do not lose their identity as the Indonesian nation. [3]

2. Research Method

This is a qualitative descriptive study. This research was conducted within 3 months, from November to December at SDN 10 KONDA Wonua Village, Kec. Konda, Kab. Counsel. The types of data in this study are primary data and secondary data. Primary data obtained from interviews with informants who understand the rules of playing marbles and teachers. Meanwhile, secondary data is in the form of documents related to the object of research. The method of data collection was carried out in three ways, namely the results of observation, tests, interviews, documentation. Furthermore, the data analysis techniques used are data reduction, data presentation, drawing conclusions. Then checking the validity of the data by checking the data developed by Lexy J. Maleong, namely the extension of participation, observational clumsiness and triangulation.

3. Results and Discussion

SDN 10 KONDA Konawe Selatan, located in Wonua Village, Konda Subdistrict, Konawe Selatan Regency on January 1, 1910. This school is actually a school that upholds cultural

values, so the rules for not bringing cellphones in schools are applied except for learning purposes but must be under guidance. This school was established since the first time it was called SDN 1 Lawoila in Lawoila Village, Konda District, South Konawe Regency. After the division of the village, it is now called Wonua village.

3.1. Description of Observation

The observations found that mathematics is considered a subject that is only obtained in school, even though mathematics is often used in various aspects of life. Learning mathematics actually occurs naturally where students can find, test and apply mathematical concepts almost every day in whatever they do.

3.2. Description of Students' Mathematical Ability Test Results

The test given to the informants was carried out after playing marbles to obtain information related to students' understanding of the concept of distance and speed in comparison if implemented into traditional games but packaged into interesting story questions, to determine the extent of students' understanding. Students' mathematical ability tests are given to all informants who play marbles. This problem the researcher gave to all class V informants who just played.

The results of the student's mathematical ability test that have been given show that students who understand the rules of playing marbles can sketch the meaning of the questions given but it is difficult to determine what formula should be used to solve them so that the percentage in this test falls into three categories, namely high, medium, low of 33 %, 25%, 42%. Researchers choose these 3 criteria based on the high test results if 80 ; moderate test result if <80 ; low test result if $Y <60$. [4]

3.3. Description of Interview Results

The results of the student interviews showed that the informants who had high scores were not due to mastering the rules of playing marbles but because of the understanding of the concept which meant that the informants were able to analyze well. Apart from that, the informants also unconsciously understand and interpret that the only rules applied in playing marbles are using the concepts of distance and velocity in the comparison material.

The results of the student interviews showed that the informants who had grades who were in completing the analysis ability test, the informants did know the rules used in playing marbles but they were not aware and did not pay attention to them to analyze what the informants applied in playing. Informants just play without paying attention to what the meaning of what they are playing, and they do not realize that they are using the concept of distance and speed when playing marbles.

The results of student interviews showed that the informants who had low scores were not because they did not master the rules of playing marbles but rather understood the concept which meant that the informants could not analyze them properly. Apart from that, the informants also unconsciously did not understand and did not understand that the only rules applied in playing marbles were using the concepts of distance and velocity in the comparison material.

In accordance with the results of the analysis in the student's mathematical ability test section, it explains that students who understand the marbles game are able to solve questions that are related to the rules used in playing marbles. The test given to the informants illustrates that students do need a local cultural approach, because the results of the test show that students are able to implement the concepts of distance and speed in comparison if they are designed in the context of marble playing rules. This is in line with research conducted by Rahmat Kamaruddin, et al, that the ethnomatic approach based on local culture in mathematics learning meets the effective requirements for designing new learning tools, because the test results given to students get scores above the KKM [5]

Based on the results of the students' mathematical ability tests, the researcher found that the percentage of scores was categorized as high, medium and low for the players. High category with a percentage of 33%; medium category with a percentage of 25%; and low category with a percentage of 42%. This means that a cultural approach in the learning process is needed by students and the design of practice questions is needed to more closely analyze students' daily lives.

From the results of the interview fragments above, there is a lot of information obtained by researchers. The interview above was conducted to see the relationship between the students' ability test answers and face to face to find out how the informants interpreted the marbles game if it was designed to be a serial problem in mathematics material. In the interaction play is dominated by men, but there are also women who also play marbles. From the selection of informants to be the sample for the interview, it turned out that one of the women was the sample for the interview with a moderate grade predicate for a student's mathematical ability test. The answers from the

informants generally said that they did not realize that they were using the concept of distance and speed in playing marbles, this was because the informants only wanted to play, not focused on analyzing the meaning of the rules of play that the informants used. In addition, informants are able to implement the rules of play that they understand into story questions, students who do not understand the rules of play are able to implement them into story questions even though the players need to make a sketch first to start answering the questions given.

Interviews with students who received low mathematical ability test scores, the researcher found that students with low scores did indeed consciously convey that they did not know what concept to use to solve this problem, but this student said that he could solve it if it was under the space for played. This means that indirectly these students actually understand what way to complete, it's just that the mathematical concept pattern has not been well developed in the minds of students, still the concept of playing rules is always well understood. This also explains that the students' lack of understanding is related to the essence of the concepts of mathematics. Hereby explains that not all students have the same weaknesses. Therefore, the teacher needs to provide a mathematics learning design that is close to students by referring to the contextual learning approach.

Apart from this, it is not necessary to only corner the teacher and motivate the teacher to design learning for mathematics learning to take place properly, there are many factors that influence including the internal factors of these students. From the research that has been conducted by researchers, based on the results of observations, mathematical ability tests and interviews that have been conducted. The researcher will make a comparison of the three to find out how the implementation will be. Based on the results of observations with class teachers and the results of teacher interviews, the researcher concluded that the approach used by the teacher in teaching was not as optimal as expected, because the approach given was based on the results of the interview using the story model approach.

Checking the results of the mathematical ability test when compared with the results of interviews conducted by researchers to informants, shows that students actually need a cultural approach in explaining the material and also in giving practice questions, researchers see that teachers must be able to touch the daily world of students so that they can slowly mathematics understood by students. As in line with research conducted by Kadek Rahayu Puspawati, and IG. A. Pt. Arya Wulandari that students must be empowered through integrating mathematical and cultural content that is in accordance with their life experiences so that it can lead to successful learning mathematics. [5]

Face-to-face one by one when compared with the results of the ability tests that have been given, it turns out that the students actually do not understand the concept in question but know the rules in order to play marbles, in other words that students really need a cultural approach in learning mathematics. According to research conducted by Turmudi, school mathematics itself is a form of learning situation and therefore takes place in context. However, context alone is not sufficient, context must be meaningful and mathematically meaningful for students

From the discussion above, it can be seen that the concepts that have been taught by the teacher to students are not very effective and students are not able to interpret these concepts because the opinions given by the teacher are still fairly abstract so that students find it difficult to try to implement the concepts that have been learned in everyday life. This is in line with research that Hasrin Lamote stated that in the core activities of teacher learning it is difficult to use learning methods and is less effective in the learning process in implementing the 2013 curriculum learning [6]

And the students' way of thinking is still far away if the concept is not translated into students' daily lives so that the concepts embedded in the students' mind-set are still very minimal and their implementation is still lacking, because students are not able to read the meaning of what has been taught which is still a form symbols and numbers only. This is in line with what Rhudito stated that learning in class is increasingly unattractive because the teacher only presents symbols and numbers. Even if we look deeper, our culture offers many solutions for mathematics subjects, one of which is in traditional games, many of which can be used as a forum for developing students' logical thinking skills. (Rhudito.2019)

From this the researcher also sees that the need for teachers to create culture-based learning designs to slowly change the mind-set of students related to the specter that mathematics is scary. Because when this approach is accustomed, students are able to analyze slowly, so that students do not only dream of interpreting mathematics material. In line with the research conducted by Gita K Datingawaty, said that playing marbles can train motor skills, train thinking skills (cognitive), numeracy skills hone social skills, and train children to control emotions [7]

Based on this, in the journal Marta, it is stated that in formal learning, one of the subjects that can be related to culture is mathematics, this is because the causes or problems that are often encountered in mathematics learning are actually required to provide more contextual learning

4. Conclusion

Based on the results of the analysis and discussion, it can be concluded that the implementation of the concept of distance and speed in comparison to the traditional marbles game, in terms of the results of tests and interviews that have been conducted, that the percentage of students who get high, medium and low scores in completing the students' mathematical ability test is 33 %; 25% and 42%. The results of the students' mathematical ability test were still dominated by a large percentage of 42% and the percentage of students who implemented the concept of distance and speed in comparison to the traditional kereleng game by twelve dominant informants who understood the concept of playing marbles, with a percentage of 75% implementing the concept unconsciously.

Based on the large percentage of students' mathematical ability test results of 42%, it was explained that students really did not understand the concepts that had been given by the teacher during the learning process and the percentage of implementation was 75% illustrating that unconsciously students actually used the concept in playing marbles, they just did not understand that the concept it is a concept taught in school.

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