Role Playing Based on Multicultural for Understanding Fraction in Primary School

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Abstract. Multicultural serve as a reference in the development of innovative mathematical learning materials and is expected to be a solution in improving the ability of students in understanding the fraction matter based on social and mathematical approach, so this study aims to determine the improvement of students' understanding in fraction matter through role playing by integrating multicultural concepts as development learning content. Classroom Action Research conducted on 34 students in elementary school class proves that students' understanding in fraction matter shows improvement in cycle II as much as 67% of students are able to apply the concept or formula exactly when compared with the result of cycles I of 33%. This research is expected to be the reference of teachers in developing innovative mathematical learning, let alone explicitly, this concept not only emphasizes the cognitive abilities of students, but implicitly can develop their social skills in mathematical perspective.

1. Introduction

Understanding the concepts in mathematics subjects by students has an important influences in the process of successful learning. Van de Walle explained that the definition of understanding as the measure of the quality and quantity of the relation of an existing idea. The variety level of understanding depends the appropriate by the own idea and depends on creating a new relation between the ideas [1]. Furthermore, Conceptual knowledge is knowledge that contains many relationships or networks of ideas. As a knowledge, mathematics has distinctive features such as abstract, deductive, consistent, hierarchical, and logical. The mathematics concept is an idea or thought that allows us to grouping the sign (object) into the example. In addition it can also be interpreted that abstract of mathematics concepts that allow us to grouping (classifying) objects or events [2]. Concepts can be learned through the definitions or direct observations such as seeing, listening, discussing and thinking about the truth of the example. The students understanding of mathematics concepts can be seen from student’s ability in: define verbal and written concepts, identify, create examples and not examples, using models, diagrams, symbols to represent a concept, converting a form of representation to another form, know the various meanings and interpretations of concepts, identify the properties of a concept and recognize the conditions that define a concept, compare and differentiate concepts [3].One of the materials that are quite difficult to understand by the students in the mathematics subjects is fractions. Fraction knowledge is essential both in everyday life as well as for learning more advanced mathematics and science [5]. Fractional material is quite difficult, this is same with Hadi's research that in studying the concept of fractions it is possible to misconception students. There are some obstacles to students in fractional materials such as: not
understanding the concept yet, using the wrong process, careless in understanding the meaning of the problem, less understanding of the prerequisite concept, wrong in computation or calculation [6].

The successful in learning is not assured, but depends fundamentally on the teacher's role in making space and meaning for students' contributions to classroom discourse [7]. Through role playing, the students tried to explore the relation between interpersonal by the acts, so that together the students learn to understand and share problem solving strategies. The using of role playing once held by Hadi entitled “Learning Concepts Fractions Using the Media Comic Strategy Role Playing” [6]. The research was successful because of the improvement at the second cycle and the students were interested in learning using the comic as media and playing the role. However, researchers chose a role playing to enhance student understands fractions material in grade V in Primary School. Role playing on this fraction matter is integrated with multicultural principles, so it is expected to be an innovation of mathematical learning that not only emphasizes the cognitive ability, but implicitly help the students could interpret the multicultural values in the learning that has been done. Multicultural have taught us a few things about the needs of our teachers as well as the kinds of experiences that hold more promise for preparing them to work with diverse populations of children [8].

This study aims to reveal that learning mathematics is not always related to numbers and cognitive abilities only. Although explicitly, the measurements are still limited with the calculation of numbers, but implicitly this research aims to develop students' social skills in implementing the principles of multiculturalism. Classroom Action Research conducted on 34 grade V students in elementary school proves that there is improvement in understanding of students in applying the concept or formula of fraction counting operations in second cycle as much as 67%. While in the first cycle, the students' understanding is still limited, 37% of students are able to answer the question but do not use the workmanship mathematical procedures. In addition, students indirectly recognize the figures contained in the script and the problem based on the principle of multiculturalism so they are expected to have Social skills in respecting differences in diverse societies. This research is expected to be a guide for teachers in an effort to create a more meaningful mathematics learning, which is not only oriented to the cognitive aspect only, but began to integrate social values that are useful for life.

2. Methodology
Researchers use classroom action research methods to determine students' level of understanding in fraction matter through the implementation of multi-cultural role playing. This method is expected to be able to explain the description of the students' ability in quantitative and qualitative terms. Action research is used by educational practitioners to improve their practices [9]. Here, Figure 1 shows the stages of action research.

![Figure 1. The stages of action research](image-url)

Based on Figure 1 action research used are planning (planning), implementation (acting), observation (observing) and reflective (reflecting), with the implementation phase and observations made in the time period simultaneously. Subject of this research were 34 students of grade V elementary school with two different treatments in two cycles. The data to be collected in this research
are qualitative data and quantitative data. Qualitative data can be an observation sheet of teachers and student activities, and documentation studies that will be described. Qualitative data will be processed using non-statistical techniques. Non-statistical technique is the data processing by not using statistical analysis, but with qualitative analysis.

3. Result and Discussion

Multicultural becomes the right base in developing innovative mathematical learning. Multiculturalism can simply be said to recognize cultural pluralism [10]. Students need to be made aware that within the accepted knowledge there is a wide variety of interpretations that are strongly determined by their respective interests, it may appear to be contradictory in accordance with their point of view. Multicultural education means as an educational process of respectful, sincere, tolerant way to cultural diversity that lives in the midst of plural society [11], so that learners will have a spirit of unity in difference. This is the concern of researchers in testing the perspective of social knowledge in learning mathematic. Multiculturalism be the basis in developing role playing model during learning in cycles 1 and 2. This multicultural approach is interpreted in the form of role playing script and student comprehension test.

The form of integration of multiculturalism content in role playing script and student comprehension test is seen in characterizations in stories that use the names of influential figures in the world, such as: Obama, Davinci, Soekarno, Muhammad, and so on. The content presented also represents the attitude of tolerance in the society, so that implicitly able to change the mindset of students in understanding the importance of unity amid cultural, religious, and racial differences. In addition, this form of treatment is expected to motivate students to develop their social skills because Social skills are developed and manifest in social interaction.

In each cycle, the researcher and teacher conduct intensive cooperation to pursue the creation of learning that can improve students' comprehension skills in fraction matter. The apparent treatment differences of the two cycles in this study were seen in the students' comprehension test. Here's a matter of comprehension test in cycle 1 can be seen in Figure 2.

| 1. Obama bought a box of cookies for Rp. 40,000 to be given to the orphanage, how much does Obama have to pay for the cake? |
| 2. Sartika helped her mother to count their fruits’ stock at their shop, there are $10\frac{1}{2}$ kg of mangos, $8\frac{3}{4}$ kg of oranges, $13\frac{1}{4}$ kg of apples. How many fruits are available in their shop? |
| 3. Soekarno drove his father to buy oranges as much as 30 kg, the price of 1 kg of orange is Rp. 5,000 / kg. What is the percentage of his father’s profits if the oranges sold out? |

**Figure 2. Comprehension test of cycle 1**

Explicitly, the story is no different from the math problem in general, but implicitly the figures described in each question represent the contents of multiculturalism, such as Obama as influential figure in the USA, Sartika as one of the heroes in Indonesia, and Soekarno is a Proclaimer. Indirectly, it provides educational content related to the introduction of influential figures in Indonesia and in the World. In addition, students are also taught to be more empathetic, and it can be seen based on the use of the operational word in each question. Such as: "sharing with the orphanage, helping moms, and escorting dad".

Based on the results of the test in the first cycle, only 33% percent of students who are considered to understand the pattern of fractional workmanship. Every students have their characteristic in working on this fractional questions, and most students directly answered without proper procedures. The results in the first cycle were quite disappointing, and this is due to the level of difficult questions that tend to be difficult even though the varied levels start from easy, moderate and difficult.

The questions in cycle II is made based on the evaluation in the first cycle. Characteristics of the questions were not much different from cycle I. The principle of multiculturalism and social skills
become the basis in making the questions of cycle II, but the difference is the difficulty level that tends to be easier when compared to cycle I and proven the results of student work increased from the previous cycle as much as 67%.

Table 1 shows the results data in measuring the improvement of students understanding in the level of descriptors 1 and 2 for each indicator. In Cycle 1, the students just could answer the question but do not apply the procedures in their worksheet, but in cycle 2 the students begin to work on the questions with the exact mathematical procedures.

Table 1. Comparison of level of understanding cycle I and cycle II

| Question | Number of Indicators Each Problem |
|----------|----------------------------------|
| Indicator | Cycle I | Cycle II |
| 1        | 1      | 2      |
| 2        | 2      | 2      |
| 3        | 1      | 2      |
| Total    | 4      | 6      |
| Average  | 1      | 2      |
| Percentage | 33%    | 67%    |

Table 1 provides an overview of students' comprehension of fractional math problems with indicators "students can apply the formula / concepts in simple cases / in similar cases" assessment 0-3. Student got score 0 if they didn’t answer the question, student got score (1) if student can answer but not apply concept or formula appropriately, student got score (2) if student can apply concept or formula appropriately but answer wrongly student, and got score (3) if students can apply concepts or formulas and respond appropriately.

4. Conclusion
The principle of multiculturalism is not always interpreted as one of social approach, but in the perspective of mathematic, this principle can be used as a foundation in the development of fraction matter which could became the students’ implicit comprehension. Based on the results of statistical calculations that can be known the ability of students in understanding the fraction matter increased from cycle I to cycle II as much as 67%. The ability of students in understanding the question can be seen from the application of the concept and the right formula. It proves that role playing which based on the principle of multiculturalism is very suitable to be applied in learning mathematics especially in fractional discussion in elementary school.

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