IMPROVING STUDENTS SKILL IN UNDERSTANDING AND APPLYING THE MATHEMATICAL CONCEPT OR FORMULA THROUGH ROLE PLAYING METHOD

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Abstract

This study aims to determine (1) the learning plan by using role playing, (2) the implementation of learning by using role playing, and (3) improved understanding of students in applying the mathematical concept or formulas through methods Role Playing in class V SDIT IbadurrahmanTasikmalaya. This research is motivated by the low-ability learners in applying mathematical concept or formula in the works about the story material fractions. The method used in this research is a classroom action research with the spiral model developed by Kemmis and Taggart. The stages were used namely planning, implementation, observation, and reflection. Research students understanding based on the indicators that have been established that students are able to apply the concepts or mathematical formulas in a simple case or in similar cases. The results of the analysis of indicator 1 in Cycle I shows that as many as 33% of students understanding contained in the descriptor 1 where the students can answer but do not apply the concept or formula correctly, while in the Cycle II as much as 67% of students understanding reached descriptor 2 which learners can apply the concept or formula correctly, but the answer is still wrong.

Keywords: Role Playing method, application mathematical concepts or formulas, SDIT Ibadurrahman.

INTRODUCTION

There are many ways can be used by teacher in achieving learning objectives. It could be helped by using media, methods, models, and learning techniques. Teachers should pay attention on choosing these methods. Teachers should know the children’s cognitive development and which stage the students at. Primary students are 6 to 11 years old. Piaget (in Shah, 2011, p.66) classified the children’s cognitive development in the following four stages:

1. sensory-motor stage, birth to early 2 years old;
2. pre-operational stage, 2 to 7 years old;
3. concrete-operational stage, 7 to 11 years old; and
4. fomal-operation, 11 to 15 years old.

Based on the classification above, primary students are at the concrete-operational stage. At this stage, children need the concrete objects to understand a concept. This might be happened because they have a limit to coordinate their thinking. In addition, children are only able to think systematically about concrete objects and events.

On March 3, 2017, researchers conducted interviews of teachers and students in class V at SDIT Ibadurrahman, Tasikmalaya. It is concluded that learning on fractional material experiences some obstacles such as: the basic of counting operation is still weak, the demand of curriculum to the children to reach the complete learning, and learners have difficulty in
changing the story into thematic explanation because the analogy used also do not use the environment around the students.

Fractions are a mathematical term consisting of numerators and denominators. In the fraction there is the simplification of the numerator and denominator whose value remains the same. Fractional material is quite difficult. This is in line with Hadi’s research (2016, pp. 3), that "In learning the concept of fractions it is possible to occur the misconception.” In addition, according to Untari (2013, pp. 7), there are some obstacles to learners in fractional materials such as:

1. Not understanding the concept yet.
2. Using the wrong process.
3. Careless in understanding the meaning of the problem.
4. Less understanding of the prerequisite concept.
5. Wrong in computation or calculation.

To overcome these obstacles, researchers used the method of role playing. The use of this method, on the basis of the theory put forward by Piaget and Confucius (in Silberman, 2006, p.23) on the need for active learning

I heard, I forgot
What I see, I remember
What I do, I understand

Moreover, the theory put forward by Edgar Dale (in, Sanjaya, 2010, pp. 166) became the basis of this study. Edgar Dale makes the experience cone as below.

**Figure 1. Cone of Experience**
Role playing method is at the stage of direct experience. The experience is gained by learners as a result of their own activities in the classroom. Learners experienced and felt themselves all the activities that aim to achieve the learning objectives. It means that learners deal directly with objects without intermediaries. Thus, with direct experience learners will easily understand a concept. The role playing method is a part of the simulation that is directed to create an event. By using this method learners gain learning experience such as: the ability of cooperation, communicative, and interpret an event.

Through role playing, the students tried to explore the relationships between people by its modeling, so that the students learned to understand and shared the problem solving strategies. The use of role playing once performed by Hadi (2013), entitled Learning Concepts Fractions Using the Media Comic Strategy through Role Playing. The research was successful because of the improvement between the first research up to the second cycle and the students were interested in learning using the comic media and playing the role.

Based on previous studies, researchers chose a role playing (buying and selling) to overcome various obstacles on math lesson material fractions in grade V in SDIT Ibadurrahman. Learners will play the role of buying and selling transactions related to the fractional material.

METHODOLOGY

The location of research in the classroom of Islamic Primary School Ibadurrahman located in Tasikmalaya with the subject of student research as many as 34 people. Determination of research subjects is done through purposive sampling technique. This study used a Classroom Action Research (CAR) model spiral developed by Kemmis and Taggart. Arikunto (2009, p. 2): "Classroom action research is not just teaching as usual, but it must contain an understanding that actions are based on improving outcomes, which are better than ever." The usual stages used are planning, implementation, observation and reflective, with the implementation stages and observations made in the same period.

RESULTS

Cycle I

Improved understanding of learners can be measured through the results of the Student’s Comprehension Test. The successful of this method is determined by the students’ achievement in solving the problems.

In this Student’s Comprehension Test, there are three problems with the different levels of difficulty, ranging from the easiest, the least, and the most difficult. These issues are based on the structure or pattern contained in about the National Exam that has been validated constructs (Expert Judgment) by the mathematics teacher who was in the school.

Based on these problems, researchers analyzed the understanding of learners in answering stories with indicators and descriptors that have been determined, namely:

**Indicators:** Students are able to apply the concepts or mathematical formulas in a simple case or in similar cases.

**Descriptors 0-3**

0: No answer
1: Students are able to answer but does not apply the concept or formula appropriately.
2: Students are able to apply the concept or formula correctly, but the answer is still wrong.
3: Students are able to apply the concepts or formulas and answered appropriately.

Researchers tried to analyze and classify based on the level of the students' ability in completing each number in Student’s Comprehension Test.

a. **Question Number 1**

Question number one is a question with the easiest level of difficulty, but in fact the students’ understanding ability in each indicator is not directly proportional to the level of difficulty that researchers have determined. Based on the analysis of the researchers in question number 1 cycle I, it appears that the students’ understanding ability of the question number 1 is in descriptor 1.

b. **Question Number 2**

Question number two is a question with difficulty level is not too easy or not too difficult, but all students tried to answer although some of them are still wrong, but when compared with the results of the question of number one, both have relatively the same results. Based on the analysis of the researcher in question 2 of cycle I, it appears that the students’ understanding ability of the question number 2 is in descriptor 2.

c. **Question Number 3**

Question number three is a question with the most difficult degree of difficulty, so it seems clear that the comparison with the two previous questions that tend to be better results, but as the previous questions all students tried to answer even though most of them are still wrong. Based on the analysis of researchers in question number 3 cycle I, it appears that the students’ understanding ability of the question number 3 is in the descriptor level 1.

**Cycle II**

Cycle II is a refinement in the previous cycle, and the instrument based on the reflection of cycle I as an effort to improve the quality of learning that has implications for improving students' understanding.

In Student’s Comprehension Test II, there are three problems with different levels of difficulty, ranging from the easiest, the least, and the most difficult.

The Indicators and descriptors of the analyzed understanding are the same as in previous cycles, therefore, researchers analyzed and classified based on the level of learners in answering stories with indicators and descriptors that have been determined.

a. **Question Number 1**

Following the pattern in cycle I, question number one is a problem with the easiest level of difficulty. Based on the analysis of researchers in the question number 1 cycle II, it appears that the students’ understanding ability of the question number 1 is in descriptor 2.

b. **Question Number 2**

As in cycle I, in cycle II the number 2 issue is a matter of middle difficulty. Based on the researcher's analysis in question 2 of cycle 2, it appears that the students’ average level is in descriptor 2.

c. **Question Number 3**

Question number 3 in Cycle II is a problem that has the hardest level compared to the number 1 and 2. However, learners tried to answer the problem even though some of them are still wrong. Based on the analysis of researchers in question number 3 cycle II can be seen that the students’ understanding ability of the question number 3 is that most of the students are on descriptor 1. It means that students could answer the question but do not use the formula or concept appropriately.

After the researchers analyzed the result from cycle I and II, it can be seen that some students have the ability of understanding in the level of descriptor 1 and 2. More detail can be seen through table 1 below.
Table 1
The Comparison between Cycle I and Cycle II

<table>
<thead>
<tr>
<th>Question</th>
<th>The improvement of comprehension in Cycle I and Cycle II</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Cycle I: 1</td>
</tr>
<tr>
<td>2</td>
<td>Cycle I: 2</td>
</tr>
<tr>
<td>3</td>
<td>Cycle I: 1</td>
</tr>
<tr>
<td>Total</td>
<td>4</td>
</tr>
<tr>
<td>Average</td>
<td>1</td>
</tr>
</tbody>
</table>

Based on the table above, it can be seen that in cycle I, most students could answer but do not apply the concept or formula exactly, for example in the picture below.

![Figure 2. Question Number 1](image1)

Most of students are able to answer the question of the short stories with the workmanship procedures appropriate, such as the use of the phrase "Know: .... Asked: ... and the answer ...." but in the processing on answering of the story not using the concept operation of fractions.

But in cycle II, the students’ ability becoming much better, increased one level up to descriptor 2, so in the indicator 1 cycle II, students could apply the concept or formula exactly but the answer is still wrong, the following examples of student workmanship in cycle II descriptors 2 in figure 2 question no 3.

![Figure 3. Question Number 3](image2)

A clearer picture of the improvement in cycle I and cycle II in can be seen in the chart below.
CONCLUSIONS AND SUGGESTIONS

After the researchers analyzed the result in cycle I and II, it seems that some students have the understanding ability in the level of descriptors 1, it means that students are able to answer but does not apply the concept or formula appropriately. Most of students are able to answer the question of the short stories with the workmanship procedures appropriate, such as the use of the phrase "Know: .... Asked: ... and the answer ...." but in the processing on answering of the story not using the concept operation of fractions. However, in cycle II, the students’ ability became much better, improved one level into descriptors 2 means: and students are able to apply the concept or formula correctly, but the answer is still wrong.

BIBLIOGRAPHY


