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Application of Cultural Based Discovery Method to Increase The Mathematical Solution Ability of Academic Year Students 2019/2020

Dwi Novita Sari[1*], Nurul Azmi[2]
[1]Department of Mathematic Education, Nusantara Muslim University of AL Wasliyah, Indonesia
[2]Department of Mathematic Education, Nusantara Muslim University of AL Wasliyah, Indonesia

ABSTRACT

The development of science at the present time requires educators to create learning innovations especially mathematics learning that is associated with cultural values. In line with the goals of the State who want to advance the national culture of Indonesia in the midst of world civilization by ensuring the freedom of the people in maintaining and developing their cultural values. With the hope of collaborating between learning with local culture, in addition to preserving the existing culture, it can also help students understand the material. Educators are also required to be able to use various methods in learning so that the learning atmosphere feels comfortable. The more methods and exercises used, the higher the level of mathematical problem solving possessed and conversely the less variety of methods and exercises used, the lower the level of mathematical problem solving of students. The purpose of this study is to improve students' mathematical problem solving abilities by applying a culture-based guided discovery method. This research uses the Classroom Action Research (CAR) method. The research instrument used was a mathematical problem-solving ability test. Output targets to be achieved in this study are journals.

Keywords : Guided Discovery, Culture, Mathematical Problem Solving

Corresponding Author:
Dwi Novita Sari,
Nusantara Muslim University of AL Wasliyah,
Jl Garu II A, Medan 20147, Indonesia
Email : dwinovita@umnaw.ac.id

1. INTRODUCTION

The current development of education is closely related to the development of Science and Technology (Science and Technology). In the 21st century which is interpreted as a century that is very different from previous centuries. The extraordinary development of science in all fields in this century, especially in the field of science and technology (science and technology) which is very sophisticated makes the world increasingly narrow, because the sophistication of this technology a variety of information from various corners of the world can be accessed quickly and easily anyone and from anywhere for those who want and are able to access it, communication between individuals can be done easily, quickly anytime and anywhere.

Mathematical problem solving is an integral part of mathematics and aims so that the concepts and skills learned can be understood by students and are meaningful. In the mathematical problem solving procedure there will be diversity in problem solving when solving a problem, in other words solving a problem for each student will be different, as is the case with solving a mathematical problem. In general, mathematics is more difficult than other lessons. One problem in learning mathematics is the low ability of students to solve problems. One contributing factor is that planning for problem solving is not discussed various strategies to get answers to a problem Guided inventor in mathematics learning is to help students construct knowledge through the process, because knowing is a process not a product, starting from the process of experience so that students must be given the broadest opportunity to construct their own knowledge that must be possessed, so finding their own concepts- concepts or

principles that have been set by previous lecturers, the lecturer must create a learning environment that can truly involve students actively. Thus, guided discovery is learning that provides an opportunity for students to construct knowledge based on experience starting from guessing, finding a solution to drawing conclusions.

This is in accordance with Article 32 of the 1945 Constitution states that: "The state promotes Indonesia's national culture in the midst of world civilization by ensuring the freedom of the people in maintaining and developing their cultural values". The article mandates every Indonesian citizen to preserve and develop the Indonesian national culture in various ways. One way to follow up on the mandate in article 32 is to preserve and develop regional culture as part of the Indonesian national culture through education. This means that when culture enters learning, it will provide many conveniences in achieving the learning process.

From these explanations, it is known that using the culture-based guided discovery approach can be better applied in learning, because it involves many activities so as to provide an overview in learning directly recognized by students. So that researchers are interested in conducting research with the title "The Implementation of Culture-Based Guided Discovery Methods To Improve Students' Mathematical Problem Solving Ability in Academic Year 2019/2020".

2. RESEARCH METHOD

This type of research used in this research is classroom action research (CAR). Classroom action research (CAR) is research conducted by class teachers with an emphasis on improving or improving the learning process. The main steps that must be taken in carrying out action research are as follows: (1) action planning, (2) action implementation, (3) observation / observation, (4) reflection for follow-up planning. Researchers will describe the Application of the Culture-Based Guided Discovery Method to Improve Students' Mathematical Problem-Solving Capabilities in the Academic Year 2019/2020. Time and Place The research was conducted at the Muslim Nusantara University of Al-Wasliyah (UMN) Medan in class H semester V which took place in 2019/2020 Academic Year. The subjects of this research were 31 H semester V students of the Muslim Nusantara University of Al-Wasliyah (UMN) Medan as many as 31 people. The research instrument is a tool chosen by researchers in collecting data so that its activities become systematic and easier. Two instruments were made, namely documentation and an interview guide sheet. Data analysis in the CAR research was carried out since before entering the field, while in the field and after completion in the field. Data analysis was performed using the t-test.

3. RESULTS AND DISCUSSION

The indicators assessed are identifying the shape sequence of numbers and solving problems in the operation of the sequence of numbers using Polya steps. The summary of the pre-action results can be seen in the following table:

Table 1. Recapitulation of the results of the pre-action Mathematics Problem Solving Ability in the Number Sequence Material

NO	Indicator	*Pretest*		Percentage Average
		Observation	LKS	
1	Identify the shape of a number sequence	56, 67%	70%	60,33%
2	Resolve problems in the operation of a series of numbers using Polya steps	46,67 %	63,33%	57,50%

Based on the data above, the lecturer must take actions that can improve students' mathematical problem solving abilities on a series of numbers. Efforts can be made to improve students' mathematical problem solving abilities by applying the culture-based guided discovery method to the material series of numbers. Culture-based guided discovery methods can be applied to be able to assist students in solving mathematics problems.

Based on the learning outcomes in the pre-action we can see a recapitulation of the results of the first cycle which can be seen as follows:

Table 2. Recapitulation of Results of Cycle I Mathematics Problem Solving Ability in the Number Sequence Material

NO	Indicator	Cycle I		Percentage Average
		Observation	LKS	
1	Identify the shape of a number sequence	55,56%	76%	67,33%
2	Resolve problems in the operation of a series of numbers using Polya steps	65,56 %	70%	61,17 %

Comparison of the percentage of pre-action learning outcomes and after the first cycle can be seen in table 3 as follows:

Table 3. Comparison Results of Mathematical Problem Solving Ability in the Number Sequence Material for Pre-action and Cycle I

NO	Indicator	Percentage		% Enhancement
		pre-action	Cycle I	
1	Identify the shape of a number sequence	60,33%	67,33%	7%
2	Resolve problems in the operation of a series of numbers using Polya steps	57,50%	61,17 %	3.56%

Comparison of the percentage of achievement indicators for the pre-action and cycle I results can also be seen in Figure 1 as follows:

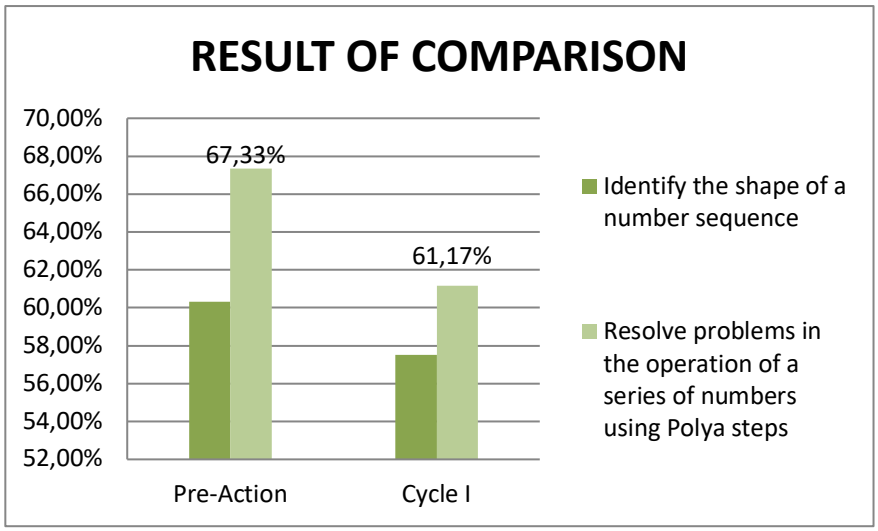

Fig 1. Comparison Results Diagram of the Ability to Identify Numbers in the Form of Pre-Action and Cycle I

Because the treatment results obtained in cycle I have not met the percentage of classical completeness 80% and there are still problems that inhibit learning occur then the same treatment is carried out with cycle I with more concrete levels of problems. Comparison of the percentage of pre-action learning outcomes, after cycle I and after cycle II can be seen in table 4 as follows:

Table 4. Comparison Results of Mathematical Problem Solving Ability in Number Series Material for Pre-Action, Cycle I and Cycle II

NO	Indicator	Persentase			Persentase Enhancement
		Pre-Action	Cycle I	Cycle II	
1	Identify the shape of a number sequence	60.33%	67.33%	80.37%	13.04%
2	Resolve problems in the operation of a series of numbers using Polya steps	57.50%	61.17 %	88.43%	27.26%

Comparison of the percentage of achievement indicators for the pre-action, cycle I and cycle II results can also be seen in Figure 2 as follows:

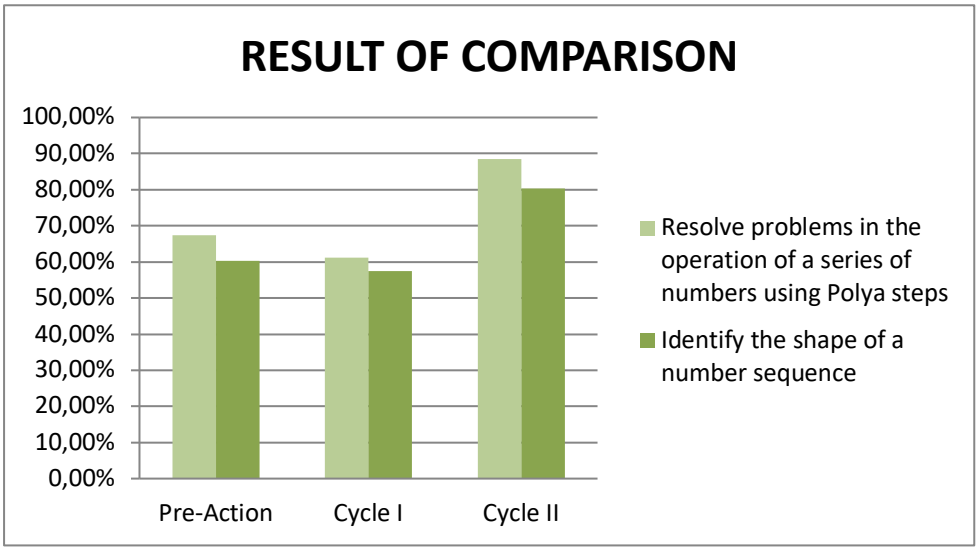

Fig 2. Comparative Results Diagram of the Ability to Identify Numbers in the Forms of Action, Cycle I and Cycle II

Based on the figure and the table above, it shows that there is an increase in each indicator of the ability to identify the shape of a series of numbers with the application of culture-based guided discovery methods in pre-action, cycle I and cycle II have reached indicators of success. The ability to identify students in pre-action, cycle I and cycle II increased by 13.04% for indicators identifying the form of a series of numbers with the application of culture-based guided discovery methods) and indicators of solving problems in the operation of a series of numbers with the application of culture-based guided discovery methods 27.26%.

The initial ability before the action shows that almost all cognitive aspects of students have not been developed optimally. Achievement on all indicators is not in accordance with the predetermined success indicators. The percentage of students' abilities in the ability to solve mathematical problems in identifying various types of numbers before the action increases from the first meeting to the second meeting.

The results of observations of the ability to solve mathematical problems before the action up to the first cycle showed an increase and change in the indicator to identify the types of numbers in the first cycle increased the initial condition results 65.56% increased to 70% and the second cycle increased by 12, 23% from the initial condition of 65.56% increased to 80.01%. Likewise, the ability to identify with the application of the culture-based guided discovery method in the first cycle from the initial condition of 56.67% increased to 68.89% and in the second cycle an increase of 24% from the initial condition of 56.67% increased to 87.23%. The percentage shows that the ability to solve mathematical problem solving kinds of numbers in a series of students has increased in each cycle. This

shows that through the application of culture-based guided discovery methods can improve students' mathematical problem solving abilities.

Through this method, it is clear that learning can make students active, and able to stimulate holistic development and help students build their own knowledge abilities by experiencing firsthand the experience. This is consistent with the opinion of Lestari (2014: 7) stating that the use of the real method is more effective in increasing learning activeness. In line with that Rahmawati (2005: 49) about learning through concrete objects can directly add meaningful insights and knowledge. The benefits of learning media are 1) attracting the attention of students, 2) increasing student motivation, 3) giving rise to the same perception and overcoming time and space.

In general, researchers carry out learning in accordance with the learning plan that has been prepared previously. At the end of each action a discussion is held between the researcher and the lecturer related to the results of the observation and then reflected as an improvement in the next cycle.

This research was stopped at the end of cycle II because in cycle II the results of students' mathematical problem solving abilities were in accordance with the indicators of success in this study. In the implementation of learning that is simulated through the learning method that is guided culture-based discovery method during the second cycle turned out to have brought changes as expected, including the increase in student cognitive, especially identifying and recognizing the concept of a series of numbers. The increase in students who have cognitive development is evidence that learning through culture-based guided discovery methods is an effective way. This is evidenced by gradual changes starting from students being able to identify and recognize the concept of a series of numbers, to being able to identify and work on LKM. Achievement of success in this second cycle cannot be separated from the efforts that researchers have made including conducting preparations before carrying out learning.

The steps taken in identifying the various forms of number sequences with the culture-based guided discovery method and resolving problems regarding number sequences by working on MFIs are the learning steps taken by the researcher, namely first, the researcher determines the learning objectives. Second, learning material based on themes. Third, the sub themes to be discussed. Fourth, students discuss various kinds of these numbers. Fifth, the learning method that will be used is a guided method of culture-based guided discovery and assignment. Sixth, the lecturer completes the assessment with the LKM observation sheet and documentation.

From the explanation above, it can be concluded that the classroom action research conducted can improve the ability to solve mathematical problem solving with a culture-based guided discovery method that encourages students to practice identifying / grouping a series of numbers seriously so that the learning process becomes good. Based on data from research results in the first cycle and second cycle, showed an increase in cognitive students when compared before the action. Cognitive in question is the ability to solve students' mathematical problems using culture-based guided discovery methods. The researcher concludes that this research has been successful and stopped because it is in accordance with the indicators of success that have been applied. This research has proven that the application of culture-based guided discovery methods to improve students' mathematical problem solving abilities.

4. CONCLUSION

The ability to identify and solve problems in the shape of the number 5 grade H students of the Muslim Nusantara University increased by using a culture-based guided discovery method. The ability to identify and solve problems in the shape of the number 5 grade H students of Muslim Nusantara University after being applied with the effective culture-based guided discovery method can be seen from a significant increase in the percentage of cycle I and cycle II results.

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