ENHANCING THE ABILITY OF MATHEMATICAL REASONING WITH THE METHOD OF DISCOVERY GUIDED AT SMAN 23 BANDUNG INDEFINED INTEGRAL MATERIAL

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Abstract

The purpose of this study was to improve students' mathematical reasoning abilities through a guided training approach. This type of research is Class Action Research (CAR). The subjects of this study were students of class XI MIPA 3 SMAN 23 Bandung Academic Year 2018-2019 which amounted to 36 students. The method of data collection is done through a method of testing students' mathematical reasoning abilities. Data analysis techniques use methods that include data collection, data reduction, data presentation, and conclusion drawing. The results of this study indicate an increase in students' mathematical reasoning abilities. This can be seen through the percentage of learning completeness (fulfilling KKM = 70) in each cycle, namely cycle I by 53%, increasing in cycle II by 92%, and increasing again in cycle III by 100%. The conclusion of this study is that the guided training approach can improve mathematical reasoning abilities of class XI MIPA 3 SMAN 23 Bandung Academic Year 2018-2019.

Keywords: CAR, Guided Exercise, Mathematical Reasoning.

Abstrak

Tujuan penelitian ini adalah meningkatkan kemampuan penalaran matematik siswa melalui pendekatan penemuan terbimbing. Jenis penelitian ini adalah Penelitian Tindakan Kelas (PTK). Subyek penelitian ini adalah siswa kelas XI MIPA 3 SMAN 23 Bandung Tahun Pelajaran 2018-2019 yang berjumlah 36 siswa. Metode pengumpulan data dilakukan melalui metode tes kemampuan penalaran matematik siswa. Teknik analisis data menggunakan metode yang meliputi pengumpulan data, reduksi data, penyajian data, dan penarikan kesimpulan. Hasil penelitian ini menunjukkan adanya peningkatan kemampuan penalaran matematik siswa. Hal ini dapat dilihat melalui presentase ketuntasan belajar (memenuhi KKM=70) pada setiap siklus yaitu siklus I sebesar 53%, meningkat pada siklus II sebesar 92%, dan meningkat kembali pada siklus III sebesar 100%. Kesimpulan penelitian ini adalah pendekatan penemuan terbimbing dapat meningkatkan kemampuan penalaran matematik siswa kelas XI MIPA 3 SMAN 23 Bandung Tahun Pelajaran 2018-2019.

Kata Kunci: PTK, Penemuan Terbimbing, Penalaran Matematik

INTRODUCTION

The quality of education itself is influenced by many factors, namely students, school managers (principals, teachers, employees, and school committees), the environment (parents, community, school), learning in the classroom, curriculum and so on. Education Quality

improvement efforts can be pursued through the efforts to manage a good class. Teachers are required to be able to create atmosphere, and actions in optimizing learning outcomes in class.

Efforts to optimise learning in the classroom are fundamental tasks and responsibilities for a teacher. Improving and optimizing student learning outcomes is one of the evidence of a teacher's professionalism. By continually pursuing different ways of learning that will improve learning outcomes in the classroom becomes a necessity along with the development of the educational world.

Mathematics learning is given at every level of education with strong and different weights, suggesting that mathematics is one of the lessons that has a crucial role in determining student success. In those conditions, the students should learn math shows good results. According to Sari (2017) One goal of learning mathematics is to allow students to use mathematical reasoning in resolving a problem. Therefore, reasoning ability is one of the things students must have in learning mathematics.

Shadiq (2004) says that mathematical reasoning is two things that are inseparable. Mathematical material Mathematics learning is given at every level of education with strong and different weights, suggesting that mathematics is one of the lessons that has a crucial role in determining student success. In those conditions, the students should learn math shows good results. According to Sari (2017) One goal of learning mathematics is to allow students to use mathematical reasoning in resolving a problem. Therefore, reasoning ability is one of the things students must have in learning mathematics.s can be understood through reasoning and reasoning understandable as well as being trained through learning mathematics. In other words, learning mathematics is not separated from the reasoned activity. Accordingly Sudihartinih (2012) mentions that reasoning is the foundation of mathematics, with a person's reasoning will be very sharp in thinking and accurate in deciding to do an action that he has already calculated. Hendriana, Rohaeti, and Sumarmo (2017) mention that the ability of reason mathematically needed to build a mathematical notion and to show evidence of the truth of the idea ist.

There are many ways to improve the mathematical reasoning ability of students. Efforts that teachers can do for that matter, such as by reviewing and discovering appropriate models, strategies and learning approaches. Bani (2011) mentions that one of the approaches that can be used to improve mathematical reasoning ability is by approach guided discovery. In line with this research conducted by Hermawan and Hidayat (2018), the results showed that achievement of mathematical reasoning ability of students through a better guided discovery approach than by Using regular learning.

Given the importance of mathematical reasoning ability, it takes an effort to improve the mathematical reasoning ability, in order to achieve satisfactory mathematical learning outcomes. Choosing the appropriate approach and learning model in math learning can be one of the efforts to achieve that goal.

Based on the background outlined above, the authors will conduct class action research (PTK) about the ability of mathematical reasoning of students through mathematical learning, especially in the indefinite Integral matter. Learning that will be done using guided discovery approach that is expected to improve the skills of mathematical reasoning of students at SMAN 23 Bandung.

METHOD

This type of research is a collaborative class action research (PTK) or classroom action research. Collaborative means collaborating with mathematics teachers in the XI MIPA 3 SMAN 23 Bandung class. This class action research uses the design of PTK Spiral (Arikunto, 2006) consisting of four stages, namely planning (planning), action, observation, and reflection. Components of action and observation as a whole. The result of this observation was made base of the next step of reflection. From the reflection compiled a modification that was astualized in tests and observations and so on, in accordance with figure 1 follows.
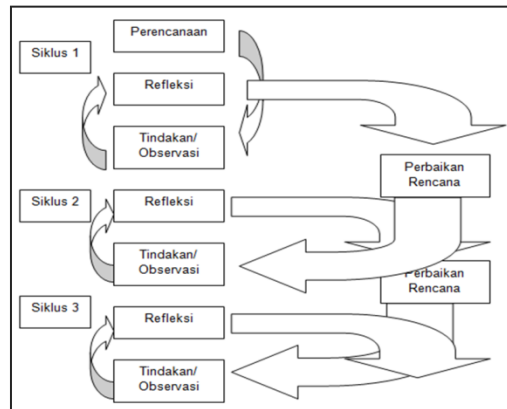

Figure 1. Cycle of Method

The subject of this study is a grade student of XI MIPA 3 SMAN 23 Bandung Year lesson 2018/2019 amounting to 36 students. Each student has different characteristics of each other. They are from different backgrounds, have different abilities, then put together in one class to learn from each other.

Data is collected through tests conducted to determine the extent of the student's mathematical ability. The results of research Data are analyzed descriptively for each cycle. The descriptive analysis technique used Back knows the implementation of mathematics learning using guided discovery approaches.

Test Data on mathematical reasoning Ability is analyzed to conclude student percentage complete. Students are completed when obtaining a minimum value of KKM at SMAN 23 Bandung, 70. The success indicator in this class action research (PTK) is an increase in the percentage of students who achieved the achievement of the study performance test, which is as much as 75% of the grade students of XI MIPA 3 SMAN 23 Bandung reach the goal of submission. Students are said to be completed when getting a minimum value of 70 in the math reasoning ability test.

RESULTS AND DISCUSSION

Result

Class action Research (PTK) was conducted in class XI MIPA 3 SMAN 23 Bandung as many as 3 cycles. Each cycle consists of 2 meetings with the first meeting as a math and a second meeting as a test of students ' mathematical reasoning ability. In the lesson of the teacher using the approach of discovery guided by the material taught is indefinite integral.

Classroom Action Research (PTK) aims to improve the ability of mathematical reasoning of students with a guided discovery approach. This can be seen by the test results of the mathematical reasoning ability of each cycle, as in the diagram below:
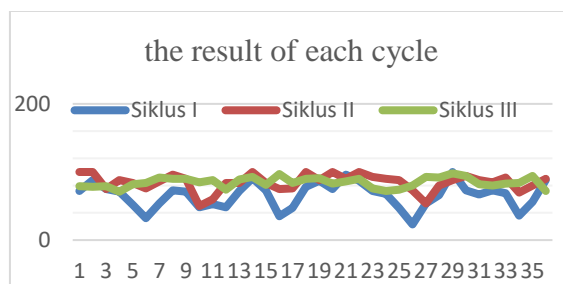
Figure 2. The Result of Each Cycle

In the diagram (see figure 2), it can be seen that in cycle I, mathematical reasoning ability is still relatively low, seen from still enough test results of mathematical reasoning skills that were worshipped KKM (70) with an average of 66. While in cycle II, there is an improvement in the test results of mathematical reasoning ability seen in the average diagram of the student test results are above the KKM (70) with an average of 85, although there are still students who are still under the value of the KKM (70) . Then in the III cycle, there was an increase back in the mathematical reasoning ability test which made the submission of learning. This is evident from the test results, which resulted in 100% of the students earning a value above the KKM (70) with an average of 85.

Discussion

On the cycle I the test results of the mathematical reasoning ability of students still have not reached 75%, which is only 53% of the submission percentage. This is due to various factors, one of which is the learning readiness of students in learning with the approach of meeting to be newly implemented in the class. Not only is material that is classified as difficult material to make less than some students can not follow well at the beginning of the defend. One of the content/material that can not be followed properly is about determining the equation of a curve on the subject of unnecessarily integral. Result of cycle I, can be seen as diagram below: In diagram 1, obtained that from 36 students who have reached KKM (completed) are as many as 19 students while 17 others are not yet completed, or for 53% of the grade students of XI MIPA-3 have fulfilled the KKM in cycle II (see figure 3) improvement of the test results of mathematical reasoning ability students, can be seen clearly,
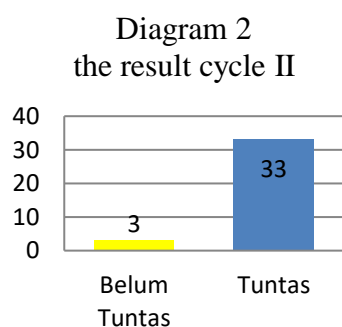
Diagram 2
the result cycle II

Figure 3. The Result of Cycle II

In the III cycle the results of the mathematical reasoning ability test students can reach 100%. This means that in cycle III all 36 students in class XI MIPA 3 can reach KKM and can be considered as complete in the mathematical The result of cycle III can be seen as diagram 3 below:
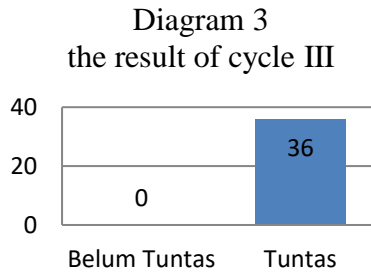
Diagram 3
the result of cycle III

Figure 4. The Result of Cycle III

To see more clearly the improvement in the mathematical reasoning ability of students can be seen in diagram above (see figure 4). As such, it can generally be said that with the implementation of mathematical learning through a guided discovery approach can increase the mathematical reasoning ability of students.

CONCLUSION

Based on the results of class action Research (PTK) in class students of XI MIPA-3 SMAN 23 Bandung Degan The guided approach can increase the mathematical reasoning ability on the subject of indefined integral. This can be seen from the percentage of submission (fulfilling the KKM = 70) test result of mathematical reasoning ability of students at each end of the cycle, i.e. cycle I of 53%, increased in cycle II by 92%, and increased back in cycle III by 100%.

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42   Djatmiko., Akhid, I. Enchancing The Ability of Mathematical Reasoning with The Method Discovery Guided at SMAN 23 Bandung Indefined Integral Material.

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