

GUIDED DISCOVERY METHODS APPLICATION TO IMPROVE STUDENT LEARNING OUTCOMES IN MATERIALS QUATION OF SQUARE IN CLASS X SMA SWASTA MERANTI

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Abstract- The purpose of this study is to improve student learning outcomes with the adoption of a quadratic equation guided on the material in Meranti Private high school in the academic year 2013/2014. The subjects were students of class X SMA Private Meranti. The research was conducted in two cycles, each cycle consisting of planning, action, observation, evaluation and reflection. The results showed that the study reached the measure of success of the study after the second cycle executed, with a percentage of 91.43% classical completeness. Based on the study results obtained can be concluded that the application of guided discovery method can improve learning outcomes of students of class X SMA Private Meranti. So it is suggested that the teaching material should quadratic equations using the method of guided discovery.

Keywords: guided discovery & learning outcomes

1. INTRODUCTION

Math is not foreign to us, mathematics is the queen of science in which mathematical material required of elementary school (SD) to Higher Education (PT). Mathematics as one of the fields of science in education is a field of study that is very important, both for learners and developers of other scientific fields.

According to the educational unit level curriculum (SBC) Destination math lessons are: (1) Understanding the concepts of mathematics, describes the relationship between concepts and apply concepts or algorithms, are flexible, accurate, efficient, and precise in troubleshooting; (2) Using the reasoning in the patterns and nature, perform mathematical manipulation in making generalizations, compile evidence, or explain mathematical ideas and statements; (3) Solve problems that include the ability to understand the problem, devised a mathematical model, solve the model and interpret the obtained solution; (4) Communicate ideas with symbols, tables, diagrams, or other media to clarify the situation and problems; (5) Have respect for the usefulness of mathematics in life, are curious, attention, and interest in studying mathematics, as well as a tenacious attitude and confidence in solving problems [4].

One aspect that is emphasized in the curriculum is to enhance understanding of mathematical concepts and links between concepts. In the mathematical linkage of each concept is interwoven so understanding in the concept will greatly support the understanding of other concepts. As well as understanding the concept of number operations at the primary school will be very influential on the mastery of other concepts in mathematics learning structure. Likewise, understanding the concept of linear equations is very influential on the concept of quadratic equations.

Therefore, understanding of concepts in math should be given to all students starting from the ground level so as to equip their ability to grasp the concept and understand the procedure (algorithm) is flexible, accurate, precise and efficient in solving problems that designed the teacher in the learning process in the classroom.

In the teaching and learning process in the classroom there is interaction or relationship between students and teachers. Teachers provide the subject matter in accordance with the draft that has been made and the students receive the lesson. Crafted design aims to enable students to master the lessons will be given.

In the process of learning in the classroom many students who do not master the teaching materials. This indication can be seen from the results of student learning are low, especially in math. Causes include the ability of students is heterogeneous, students are afraid to ask the teacher, learning

is the transfer of knowledge from teachers or books to students, knowledge received ready-made without the involvement of students in found that knowledge did not last long in the students and the students are not able to resolve the different problems with the example set by the teacher. Those things are thought to be the cause of poor student learning outcomes.

Based on the information investigators received from Sri Dewi Purwati, Mathematics Teacher class X SMA Private Meranti District of Meranti, that results for students in math is still relatively low, 55% of the students scored below the KKM (Criterion completeness maximum) is 70, student interest to learn mathematics is still lacking, lazy work on the problems, and lack of awareness in learning mathematics. This event may be caused because teachers still use conventional methods of learning. Teachers also have to make improvements in teaching such as using the method of discussion, give homework, exercises and example problems multiply. But it is not enough if the teacher does not involve their students to participate actively in learning activities and establishment of cooperation between students so that many students are lazy to do exercise, when asked teachers in general students do not know or wrong answer, only a few students want to do homework while others are there who work with cheating and some are not willing to do. This makes the learning process has not been successful the teachers. Similarly, for the material Equality squares, students still do not understand in understanding the matter, does not memorize the formula and can not apply the knowledge they have previously to solve a problem. To increase students' activity in learning activities, the authors are interested in using the method of guided discovery. Due to the use of guided discovery method is not only filled with learning exercises. But through this method, students actively think, communicate, and process data, finally concluded and students be directed to use the new knowledge with the help of the teacher as a facilitator.

Guided discovery teaching method according to Massialas is a teaching method that allows students to move step by step from problem identification problem defining hypothesis formulation, data collection, verification of results, and generalization to drawing conclusions [3]. Guided discovery is one of the teaching methods that employ exploration, manipulation and experimentation to find new ideas; Akuma-oriented problem solving method [1].

Guided discovery learning strategy is characterized by convergent thinking. trainer devises a series of statements or questions that guide students, step by logical step, made a series of discoveries that led to a single predetermined goals. In other words, teachers and students begin to react with the stimulus involves active investigation so as to find a proper response. an extensive review of the literature by DeJong and Refrigeration shows that in general simulation guided discovery leads to better outcomes than non-guided. It helps to better understand the concept and of course better to train the process of discovery itself. DeJong [1].

According Markaban guided discovery method for learning to work effectively, there are steps that must be taken by teachers of mathematics are as follows: (a) Formulate the problem that will be given to students with the data sufficiently. Formulation should be clear, avoid statements that led to the wrong so that the direction the student is not wrong; (b) From the data provided by the teacher, students compile, process, organize, and analyze data. In this case, this guidance should lead students to move towards the intended, through the questions, or the student worksheet (LKS); (c) The students prepare a conjecture (forecasts) on the results of the analysis performed; (d) If deemed necessary, a conjecture that has been created by students of the above is checked by the teacher. It is important to convince the students forecasts, so will the direction to be achieved; (e) Where have gained certainty about the truth of the conjecture, the conjecture verbalization are also best left to the student to arrange; (f) After the students find what they need teachers should provide exercises or additional questions to check if it's true discovery [5].

Noting Guided discovery method mentioned above can be conveyed its advantages and disadvantages. Excess of Guided discovery method is as follows: (a) Students can participate actively in the learning presented; (b) Growing at the same time cultivating an attitude of inquiry (search-find); (c) Support the students' problem solving ability; (d) Provide a vehicle for interaction among students, as well as students and teachers, so students are also trained to use the Indonesian language is good and true; (e) The material studied can achieve a high level of capability and longer lasting because students are involved in the process find him [2].

Meanwhile, kekuranganya are as follows: (a) For certain materials, the time consumed for longer; (b) Not all students can follow the lessons in this way. In the field, some students are still familiar and

easily understood by the lecture method; (c) Not all suitable topics delivered by this method. Generally, topics related to the principle can be developed with Guided discovery method [5].

2. METHODS

The research was conducted in the class X-1 SMA Private Meranti address at Perintis Kemerdekaan Street No. 182 District of Meranti Asahan. The research was conducted on September 25, 2013 s / d October 19, 2013 in the first semester of 2013/2014 T.P. Subjects in this study were class X SMA Private Meranti by the number of students 35 people with heterogeneous capabilities. The object of this research is student learning outcomes using guided discovery methods on the material quadratic equation.

In a class action research, there are four stages, namely as follows: The first phase, planning: (a) Creating a lesson plan (RPP); (b) Prepare LKS; (c) Dividing the names of the students into 6 groups are heterogeneous; (d) achievement test plan; and (e) make the observation sheet. The second phase, Implementation: Implementation of the learning is done in accordance with the RPP have been made. After learning implementation is completed, then performed the final test result of learning cycles. The third stage, Observations: This activity is carried out in the implementation of the action. The fourth stage, the stage of Reflection: The activities at this stage include: (a) Looking at what has been produced during the learning process; and (b) Looking at the students in the classical completeness. If the classical completeness $\geq 85\%$ by KKM 70, then dismissed cycle, but if it has not completed then proceed to cycle berikutnya.

Instruments in this study consisted of: (a) test, test as many as 5 about the shape of the description and given at the end of each cycle. About the tests have been validated by experts; and (b) observation, observation sheet consists dai teacher activity observation sheets and sheets of teacher activity observation were conducted in each peretemuan.

3. RESULTS AND DISCUSSION

3.1 First Cycle

Based on the results of the first cycle test instrument, the obtained data is as follows: From the observation of student activity undertaken observer conclusion that the caring aspect in the study group experienced an increase of the value of being at the first meeting to be good at meeting II and III, to be very good at meeting IV. Aspects willing to cooperate and share with group members has increased from being at the meeting I and II, to be good at a meeting of III and IV. Aspect students work on worksheets assigned by the teacher as a group increased from being at the meeting I and II, to be good at a meeting of III and IV. Aspects of the students put the data provided by teachers in groups experienced an increase of the value of being at the meeting I and II, and III both at the meeting, being very good at meeting IV. Aspect students process the data provided by teachers has increased from being at the meeting I, II and III, to be good at meeting IV. Aspect students organize data provided by teachers has increased from being at the meeting I and II, to be good at a meeting of III and IV. Aspects of the students present the results and the work of the analysis of the data obtained has increased from being at the first meeting and be good at meeting II, III and IV. Aspects of the students do exercises or extra given by teachers has increased from being at the meeting I and II, to be good at the third meeting and was very good at meeting IV. Aspects that need to get perbaikan in the next cycle is the students analyzed data provided by teachers and students prepare forecasts from the analysis of data obtained.

From the observation of the teacher's activities carried observer, at the meeting to the first and second grades of teachers categorized under implementation of learning. So at the meeting to the III and IV should be improvements. At a meeting of III and IV increase is to motivate the students, do apersepsi, formulating the problem through the student worksheet (LKS) and guide students process the data. Meanwhile, other aspects need to be increased, thus the next cycle these aspects need to be scaled back by the teacher.

Table 1. Distribution of interval values learning outcomes cycle I

No	Value	Frequency (F)	Percentage (%)
1	85-100	3	8.57%
2	70-84	19	54.29%
3	55-69	6	17.14%
4	< 55	7	20.00%
	Σ F	35	

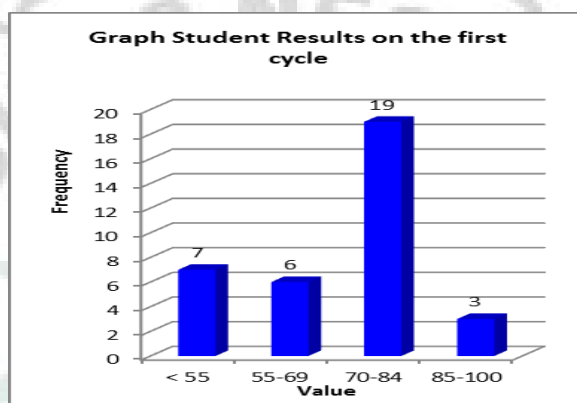


Figure 1. graph learning results first cycle

From Tabel.1 can be seen that as many as 13 students (37.14%) is not completed, in which seven students (20.00%) scored less than 55 and 6 students (17.14%) scored 55-69. While complete as many as 22 students (62.86%) of which 19 students (54.29%) scored 70-84 and 3 students (8.57%) scored 85-100. Based on data analysis techniques that classical completeness criteria should be $\geq 85\%$. While classical completeness in the first cycle was (62.86%) so that the first cycle is not yet reached the classical completeness criteria. Hence, the study continued in the second cycle.

3.2 Cycle II

From the observation of student activity during the learning takes place is already quite good. It is characterized by students to cooperate and various group members and participation in analyzing and preparing forecasts of the data analysis provided by the teacher. Learning process that teachers at the first meeting in the second cycle considered good. While in the second meeting some aspects risen to very good. Thus the efforts of teachers to improve the quality of learning can be said to have a maximum. Based on the results of the first cycle test instrument, the obtained data is as follows:

Tabel 2. Distribution interval values learning outcomes second cycle

No	Value	Frequency (F)	percentage (%)
1	85-100	14	40.00%
2	70-84	18	51.43%
3	55-69	2	5.71%
4	< 55	1	2,86%
	Σ F	35	

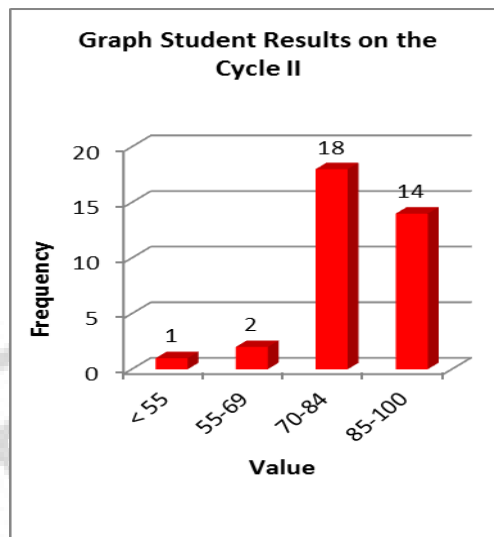


Figure 2. Graph learning results cycle II

From Table 2 it can be seen that as many as three students (8.57%) is not completed, in which one student (2.86%) who scored less than 55 and 2 students (5.71%) scored 55-69. While complete a total of 32 students (91.43%) where 18 students (51.43%) scored 70-84 and 14 students (40.00%) scored 85-100. Based on the distribution Table can be concluded that the second cycle of classical completeness criteria have been met. Therefore, the research ended in this cycle.

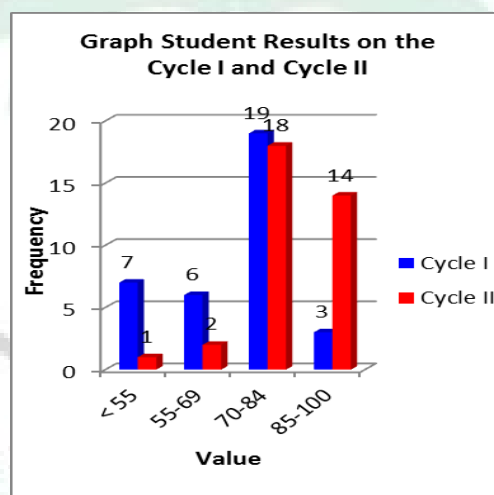


Figure 3. Graph learning results first cycle and cycle II

From Fig. 3 shows that students who scored <55 on the first cycle as much as 7 students (20.00%) and the student (2.86%) who scored <55 on the second cycle, resulting in a decrease of 17.14%. Students who scored 55-69 in the first cycle as much as 6 students (17.14%) and the second cycle by 2 students (5.71%), resulting in an increase of 11.43%. Students who scored 70-84 in the first cycle were 19 students (54.29%) and the second cycle a total of 18 students (51.43%), resulting in a decrease of 2.86%. Students who scored 85-100 in the first cycle by 3 students (8.57%) and the second cycle as many as 14 students (40.00%), resulting in an increase of 31.43%.

4. CONCLUSIONS

Based on the results of research and discussion can be concluded that through guided discovery methods on the material Quadratic equations class X SMA Private Meranti can improve learning outcomes. Based on the results of the first cycle tests on material quadratic equations, obtained by students who achieve under KKM there are 13 people (37.14%) and students who achieve above KKM 22 people (62.86%). The results of students in the second cycle, obtained by students who reach

a value below the existing KKM 3 (8.57%) and students who achieve grades above KKM 32 people (91.43%). It can be seen that the completeness of classical study in the first cycle of 62.86% and mastery learning in the second cycle of 91.43% resultSing in a modest improvement of 28.57%.

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