

## Improving Mathematics Learning Outcomes Using the Inquiry Method with Google Classroom

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### Abstract

The purpose of this research is to improve students' learning outcomes on quadratic equations through the application of the inquiry method with google classroom. The research method used classroom action research on 15 grade IX students at Kasih Bangsa Junior High School, Tangerang. The instrument as a data collection tool uses description questions, student and teacher activity observation, interviews, and documentation. Data analysis technique uses triangulation. The results and research findings on student activities have increased from cycle's I-III, the average percentages in cycles I-III are 75%, 82.5%, and 87.5%, respectively. The observation of teacher activities also increased, namely obtaining an average score of 3.33, 3.63, and 4.2 from a maximum score of 5. The results of the evaluation using 5 items of description tests for each cycle also increased, with an average score of 60.33, which rose to 72, and in the third cycle, it rose again to 75. Because it has reached the research target, namely the average value has exceeded the KKM and the KKM reached 86.21%, it can be concluded that through the application of the inquiry method with google classroom, it can improve students' mathematics learning outcomes of class IX on quadratic equation material.

Keywords: google classroom, inquiry method, mathematics learning outcomes.

## 1 INTRODUCTION

The implicit meaning in Law number 20 of 2003 concerning the National Education System emphasizes that in addition to religious studies, civics and language education, mathematics is a compulsory subject taught from primary to secondary school levels.

Mathematics is a universal science and grows because of the thought process (Mustofa, 2016). Mathematics is a science that can never be separated from human life that has existed since ancient times until now. Even since childhood mathematics has been taught in the home environment through the role of parents. Not just counting, but mathematics is a science that can put pressure on reasoning patterns of thinking, the formation of student attitudes and skills in its application in everyday life and in studying various other sciences (Tanjung, 2020).

In essence, learning mathematics given to junior high school students is easy and simple, because it is learning about the application of advanced concepts from learning that has been obtained when students were in elementary school (Uno, 2011). However, some students still think that mathematics is a difficult and boring lesson, so students are less interested in studying mathematics and cause low mathematics learning outcomes (Yuni & Fisa, 2020). The low interest in students' learning in participating in mathematics learning in class is still monotonous. This happens because the teaching method used by the teacher cannot attract students' interest. In addition, difficulties in solving mathematical problems are also things that cause students to be less interested in studying mathematics, especially in quadratic equations. This can be proven by the math test scores 53.33% of students are still below the minimum score (KKM). This data was obtained from

the mathematics teacher during the initial interview which stated that the daily test scores obtained by the Kasih Bangsa Tangerang mathematics study teacher in the 2020/2021 school year ago. Mathematics learning outcomes in grade IX students in junior high school are still low. It is proven that 53% or 8 of 15 students have not reached the KKM (Minimum Completeness Criteria) that has been determined by the school, namely 70.

The low mathematics learning outcomes of grade IX students based on interviews with mathematics teachers and 3 students each representing low-ability students, medium and high, influenced by two factors, namely; the level of student activity in the learning process is still low, and the teacher is not optimal in delivering learning materials. There were even students who stated that the teacher's teaching method was boring, finished explaining, gave assignments and was often not discussed.

In achieving an educational success, a learning method is needed that can encourage students to be actively involved both physically, mentally and socially to understand the concepts in learning, especially in the material for building flat sides. However, the reality on the ground that researchers found in the process of implementing mathematics learning was still dominated by the role of the teacher. The reality of the field encourages researchers as mathematics teachers to provide alternative learning methods. The learning method chosen by the researcher is the Inquiry Learning method. The method was chosen as a solution to the problem to be studied because it has the advantage that it can develop students' skills in critical and creative thinking so that in the learning process (Yuni, Darhim, & Turmudi, 2018). Implementation of the inquiry method requires students to always play an active role in order to create a student-centered learning atmosphere. The application of the Inquiry learning method can optimize student activity where each stage of learning is designed to organize all student activities in the classroom.

The inquiry learning method involves students in the teaching and learning process directly and trains students' activeness in the learning process where students are maximally involved in seeking and finding, so that students can formulate their own findings confidently which results in the formation of students' intellectual and emotional mentality and an attitude of trust. Himself to what he found. In addition, this learning method is very easy, cheap and simple which will create environmental conditions in the classroom that are mutually supportive through group learning in pairs and group discussions in class. This method trains students to be responsible for themselves, discussion skills with their partners and can train students' courage to answer questions and express their opinions in front of the class.

Learning outcomes are abilities possessed by students as a result of learning experiences in achieving predetermined competencies or mastery of subject matter obtained through an assessment process carried out in a planned manner to measure the abilities of these students. Each individual has a different assessment aspect, there are students who get the best learning outcomes based on the contribution of their superior knowledge, or polite and good attitudes towards teachers and peers who are considered as learning assessments, but there are also students who are less than optimal in knowledge and skills. Attitude but the student has more skills than other students, so that skill is an aspect that becomes dominant in the assessment carried out by the teacher. With good skills will support good learning outcomes as well.

Hidayat (2013) states that learning outcomes are abilities obtained by children after going through learning activities. This means that it can be called learning outcomes if it is obtained through the learning process. According to Gagne's thoughts quoted by Suprijono (2010), learning outcomes can be in the form of: (1) Verbal information, namely the capability to express knowledge in the form of language, both spoken and written. The ability to respond specifically to specific stimuli. This ability does not require symbol manipulation, problem solving or the application of rules. (2) Intellectual skills, namely the ability to present concepts and symbols. Intellectual skills consist of the ability to categorize, analytical ability-synthesis of concepts and facts and develop scientific principles. Intellectual skills are the ability to perform cognitive activities that are unique. (3) Cognitive strategies, namely the ability to channel and direct their own cognitive

activities. This ability includes the use of concepts and rules in solving problems. (4) Motor skills, namely the ability to carry out a series of physical movements in coordination matters, so that the automatism of physical movements is realized.

In line with that, Sudjana (2008) argues that learning outcomes are abilities possessed by students after they receive their learning experiences. These abilities include cognitive, affective, and psychomotor aspects. Learning outcomes can be seen through evaluation activities that aim to obtain evidence data that will show the level of students' abilities in achieving learning objectives.

Based on the opinions of the quoted experts, it can be concluded that learning outcomes are changes in behavior obtained by students as a whole after experiencing the learning process achieved. These changes can usually be seen from several domains, such as: cognitive, affective, and psychomotor in students, to find out the results can be measured through tests or direct observations. The change in behavior is due to the achievement of mastery over a number of materials given in the learning process. This achievement is based on the learning objectives that have been set both by the curriculum and by the respective schools. The learning outcomes that will be studied are of course mathematics in the quadratic equation material in junior high school.

To provide solutions to the problems of teachers and students at Kasih Bangsa Middle School, this classroom action research will apply mathematics learning using the Inquiry method with Google Classroom. And will analyze how the teacher's efforts in improving the mathematics learning outcomes of class IX students on the quadratic equation material.

The inquiry method is a teaching strategy that encourages students (participants) to be physically, mentally, and emotionally active, especially during learning activities (Anggareni et al., 2013). Students begin to perfect their initial knowledge and or build new knowledge by continuously interacting with the surrounding environment and several learning resources. With this method they are trained to try on their own, never give up in finding answers to problems, of course with the guidance of the teacher.

According to Danuri and Widdiharto (2004), as a learning method, the inquiry method places the teacher as a facilitator, the teacher guides students where needed. The implementation of learning with this inquiry method can be done individually or in groups. In brief, the steps or syntax of inquiry learning can be described as follows: (1) Learning activities still start from the teacher, in other words the teacher remains a learning resource; (2) The teacher formulates the problem by making questions that challenge students to solve the problem themselves. It is admitted that the process of making this challenging and interesting problem is not easy, it requires good insight, and reading a lot of questions from the question bank, especially the questions about the Olympics; (3) The problem is then thrown to students to be solved or find a solution. In this way, students will look creative in determining and finding completion steps, starting from compiling, processing, coordinating, and analyzing to forming a conjecture (pattern); (4) Then the teacher gives students the opportunity to present or explain their findings; (5) In the final stage, the teacher evaluates and provides reinforcement with rewards.

## **2 RESEARCH METHODS**

This research is the research with the type of classroom action research (CAR). CAR is defined as a form of reflective research by taking certain actions, in order to improve and improve learning practices in the classroom in a more professional manner (Pujihartini, 2013). This research was conducted on students.

The research data were collected using a description test, observation format, and interviews. Instrument validation is done by triangulation technique. The subjects studied were 15 students of class IX. The research was conducted in three cycles, with 4 stages, namely: planning, implementing actions, observing, and reflecting which were adopted from Kemmis and Tagart (Arikunto, 2008; Arikunto, 2010; Sugiyono, 2015).

The material that is taught and used as a test question is quadratic equations. CAR is carried out in three cycles, each cycle has two learning meetings and one meeting for tests.

### 3 RESULT AND DISCUSSION

Classroom action research findings are reported in each cycle. Cycle I was carried out and completed in two meetings, the implementation of which was on 7 and 14 February 2022 with a reduced time allocation of 2x30 minutes because it was still in the New Normal Adaptation (IMR) or New Normal period. Cycle I was carried out after conducting a survey first to find out whether the material being studied was already in the quadratic equation material, of course it had received permission from the Principal. This was followed by a discussion with the mathematics teacher of class IX at Kasih Bangsa Junior High School about the lesson plans and the CAR stages to be carried out.

#### 3.1 Observation Results of Student Activities

Meetings at the beginning of each teaching and learning activity, the researcher leads a prayer to instill and familiarize students towards religion, and to be close to God. After that, just take notes (absence) of student attendance.



Figure 1a. & 1b. Learning situation in cycle I

The first meeting was conducted face-to-face which was attended by all grade IX students. The researcher then explained to the students with lectures about the material to be studied using the inquiry method and did not forget to mention the learning objectives in cycle I. The atmosphere of the meeting in cycle I was as shown in Figure 1a and 1b. The data from the observation of student activities from cycles I-III were presented.

Table 1. Recapitulation of observation results of student activities

Aspects observed	Score in cycle		
	I	II	III
Student's attendance	4	4	4
Student's enthusiasm in learnings	3	3	3
Student's creativity in learnings	2,5	3	3,5
Student's courage in asking questions	2,5	3	4
Student's response and courage to ask questions	3	3,5	3,5
Student's courage in answering questions	2	2,5	3
Student's courage to explain the work results	2	2,5	2,5
Student's in discuss problem solving with friends	3	3,5	3,5
Student's in finding solutions to problems	4	4	4
Student's in making conclusions	4	4	4
Total Score	30	33	35

To make it clear whether there is an increase, the data in Table 1 is depicted in Figure 2.

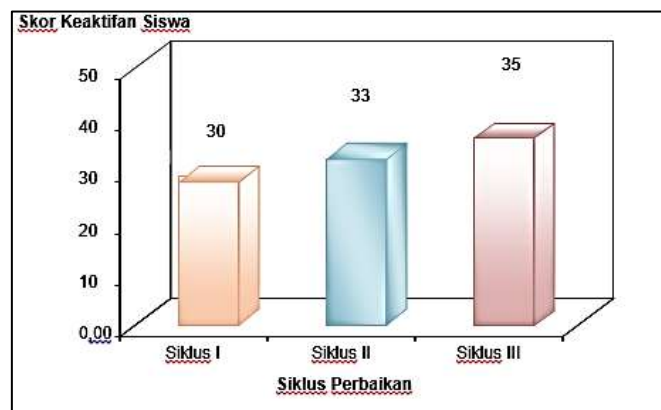


Figure 2. Graph of Student Activity Observation Results

The average observation score of students from cycles I, II, and III has increased in each aspect observed. Aspects that continue to improve in each cycle are learning creativity and the courage to ask questions. These two things show that learning with the inquiry method trains students in both aspects. It can also be seen in the aspect of daring to answer questions, both from teachers and friends. While other aspects initially increased and then tended to stabilize. The findings of this study are in line with the findings of previous CAR research which examined the improvement of learning outcomes but with a cooperative learning model with guided discovery (Setiawati & Yuni, 2021).

### 3.2 Observation Results of Teacher Activities

When the teacher applies the Inquiry method, the observer observes the aspects that have been prepared based on the learning syntax. The findings of observer observations on teacher activities, in this case, are researchers presented in Figure 3.



Figure 3. Graph of Teacher Activity Observation Results

It is very clear in Figure 3 that the teacher's activity in each cycle has increased.

### 3.3 Quadratic Equation Material Test Results

To find out the increase in student's mathematics learning outcomes in the quadratic equation material, 5 questions were given. Student test results are presented in Figure 4.

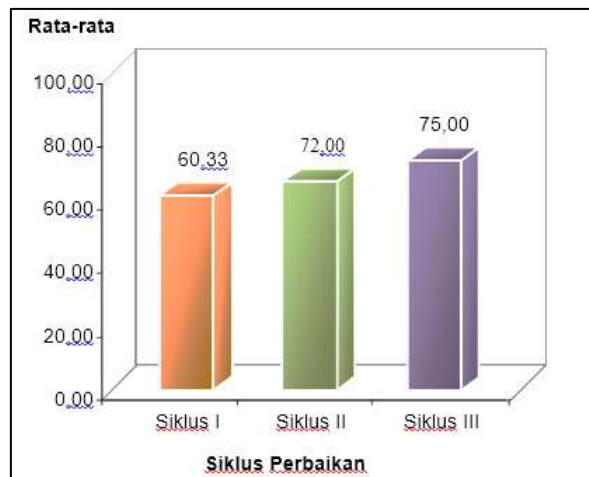


Figure 4. Graph of mathematics learning outcomes quadratic equation material

From the results of the recapitulation of cycles I, II and III, it is clear that learning with the inquiry method can improve students' mathematics learning outcomes in quadratic equations (Dudeja & Madhavi, 2018). This is clarified by Figure 4 which shows an increase in each cycle.

#### 4 CONCLUSION

There is an increase in student learning outcomes using inquiry learning on quadratic equation material in class IX of Kasih Bangsa Junior High School Tangerang. The increase occurs because the inquiry method can make students more creative and independent in learning and in solving questions.

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