INCREASING THE ABILITY OF RESOLVING QUADRATIC EQUATIONS BY USING GROUP DISCUSSION METHOD FOR STUDENTS IN CLASS X-6 OF SMA KOLESE DE BRITTO YOGYAKARTA IN ACADEMIC YEAR 2016/2017. CLASSROOM ACTION RESEARCH.

F.X. Catur Supatmono[1]
Yulius Keremata Lede[2]

John de Britto Senior High School[1,2]

catursupatmono@gmail.com[1]
yuliusllede@gmail.com[2]

Abstract
This research aimed to find out whether a group discussion method could improve the ability of the students in class X-6 of SMA Kolese De Britto Yogyakarta in academic year 2016/2017 in resolving the quadratic equation. The main data was obtained by using pre-test and post-test. Meanwhile, the subordinate data was collected by using observation sheets which were completed with significant notes written by three observers. The data analysis technique used in this research was descriptive qualitative which was used to analyze the main data which was obtained from pre-test and post-test. In order to find out the increase occurred, the researcher used the data which was obtained from pre-test and post-test and calculated the percentage of learners who successfully passed those tests and vice versa. Based on the results from the first cycle until the third cycle, group discussion method is able to improve the ability of learners in resolving quadratic equations using the perfect quadratic method, the ABC formula, and the factoring. Group discussion method as what has been studied in this classroom action research is highly recommended in the process of learning mathematics in the classroom. In addition to improving learning outcomes, group discussion method can also help students discuss the materials and learn together. Besides, through group discussion method, students are able to share their knowledge, accept different thoughts and finally use the best thought for the sake of the group and their self-progress.

Keywords: increasing, ability, resolving quadratic equations, group discussion method**.**

Research Background

Learning process is one important factors that can influence the achievement of the preferred learning objectives. In order to learn something or to solve a problem one has to master the simpler abilities or rules as qualifications of the solution (Nasution, 2005). There are thirty five male students in class X-6 of SMA Kolese De Britto Yogyakarta in Academic Year 2016/2017. The daily learning process of mathematics in the classroom is done by delivering perceptions such as explaining the learning materials which have been planned before as the teacher's core

activity, guiding students in doing the individual exercises, discussing both materials and exercises, and the closing the lesson by concluding the learning materials that have just been learned. Through those learning processes, the number of learners who successfully pass the minimum criteria of tests and vice versa are categorized as follows:

Tabel 1.

Numbers	Test 1	Percentage	Test 2	Percentage	Midterm Test	Percentage
Those who didn't pass the minimum criteria	4	11%	11	31%	14	40%
Those who passed the minimum criteria	31	89%	24	69%	21	60%

Based on the table, it can be seen that there is an increasing numbers of students who cannot pass the minimum criteria of each test. Hence, based on the background described above, the researcher formulates this research problem: Is the group discussion method able to improve the ability of students in class X-6 of SMA Kolese De Britto Yogyakarta in Academic Year 2016/2017 in solving the quadratic equation?

Review Of Related Literature

Theoretical foundations used in this study include: (i) Improvement (ii) The ability to solve quadratic equations (iii) Group discussion methods.

A. Improvement

The "improvement" comes from the word "level" which means the layer or layer of something which then forms the arrangement. Level also means standard, rank and class. While improvement means progress. In general, improvement is an effort to increase the degree, level, and quality, as well as quantity. Improvement also means the addition of skills and abilities to get better. (http://www.duniapelajar.com retrieved on Friday, September 2nd, 2016 at 3.10 P.M.).

B. The Ability to Solve Quadratic Equations

The ability to solve quadratic equations is the ability of learners to find the roots of quadratic equations by using the factoring, completing the perfect squares, and using the ABC formula. The ability to solve quadratic equations involves understanding and the learning mastery relating to the method or procedure to accomplish the problems. Therefore, the ability to solve the problems is a cognitive ability.

John A. Van de Walle elaborates the principles and standards of verbs related to the of mathematics processes. They are revealing, investigating, guessing, completing, proving, presenting, formulating, discovering, constructing, testing, explaining, estimating, developing, illustrating and applying.

The verbs above state the process of "understanding" and the "explaining". When learners are involved in the various activities based on the verbs above, they must not have been passive listeners or observers. They need to be actively involved in intellectual about the mathematical ideas discussed. If these activities are done every day, the learners will surely get a reinforcing message: "You are able to understand this, you are able to do math!". (John A. Van de Walle, 2007)

C. Group Discussion Methods

David W. Johnson and Roger T. Johnson stated that learning together or group discussion is a learning style that prioritizes teamwork. In this method learners are allowed to exchange ideas and ideas to enable them to interact actively and positively. In this case the teacher only acts as a facilitator who associates the higher comprehension of learners' own understanding. It means that the teachers do not only provide knowledge for the learners, but also build knowledge in students' mind so that learners have a deep understanding of the concepts delivering by the teachers.

Group discussion is a form of learning in which learners learn and work in small collaborative groups whose members consist of four to six people with heterogeneous group structures. In this kind of learning, the cooperation among members of the group is emphasis. However, each member of the group also has individual responsibility. It means that the success of the group depends on how individual learner involves in the group, so that each member of the group is ready to face other activities when he or she has to work individually.

A group learning can be categorized as a group discussion if it consists of several things as follows:

a) Each learner in the group is responsible for everything done in the group, as well as what is done by his or herself.
b) Each learner must know that all learners have the same goals.
c) Each learner in the group should share the same duties and responsibilities among the group members.
d) Each learner will be subject to evaluations that will influence the evaluation in his group.
e) Each learner in the group shares leadership and requires skills to learn together.
f) Each learner in the group requires individual responsibility for the cases solved in cooperative groups.

Methodology

This research is a classroom action research, which will involve teachers, students, and observers collaboratively. The study was conducted in class X-6 of SMA Kolese De Britto at Jalan Laksda Adisucipto 161, Depok, Sleman, Yogyakarta. The research was conducted on 19th October 2016 up to 26th October 2017. The subject of this study were thirty five male students in

class X-6 class of SMA Kolese De Britto. The main data was obtained by using students' pre-test and post-test scores from every cycle. Meanwhile, the subordinate data was collected by using observation sheets and the results of students' reflections which were done at the end of the lesson in every cycle.

Result and Discussion

This study consists of three cycles. Each cycle consists of four stages: planning, action implementation, observation and reflection. In the first cycle the topic of learning materials is to solve quadratic equations using the perfect quadratic method. In the first cycle, the average scores of the post-test was 68.7 which was better than the average scores of the pre-test that was 20.9. However the percentage of students' mastery which was 43% did not reach the performance indicator, so that cycle two was needed.

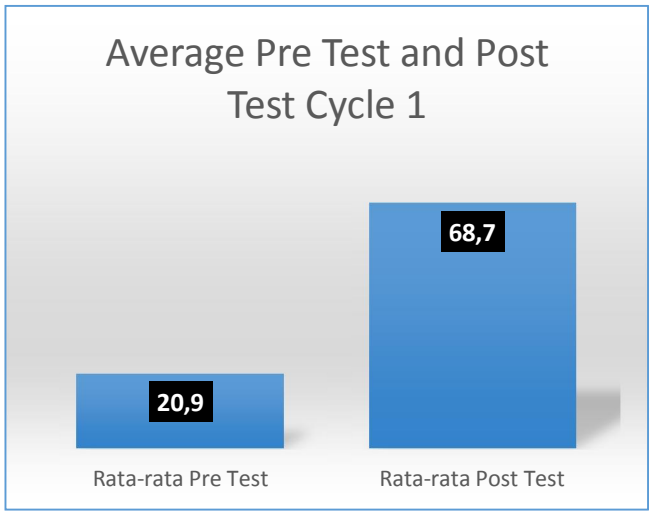


Figure 1.

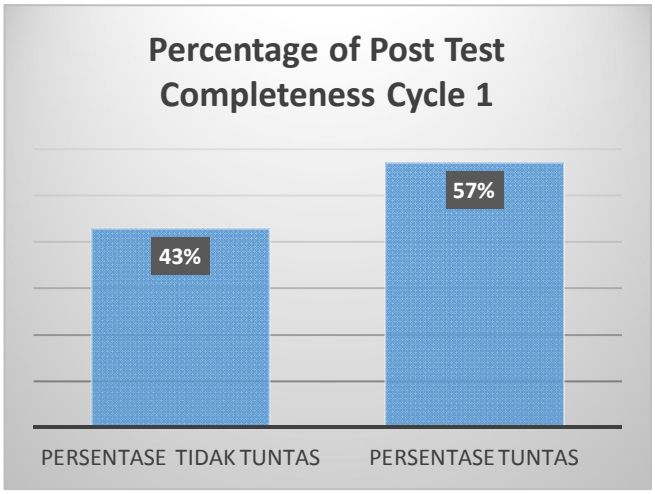
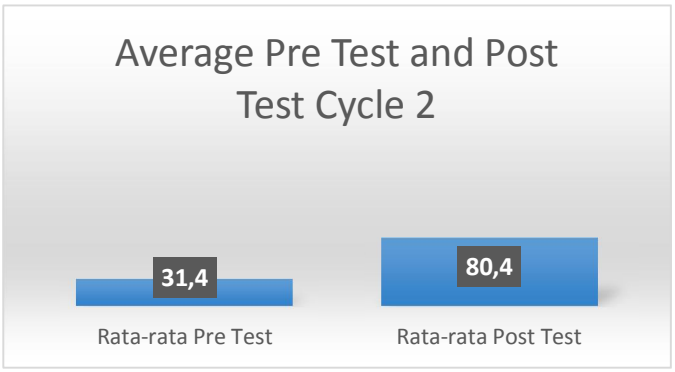


Figure 2.

After examining the pre-test and post-test results, the observers' notes and the results of student reflection, the researcher reflects some significant points. They are: (i) Generally, the learning process has worked well. Students' involvement as an individual and also as a group are good. (ii) Performance indicators cannot be achieved due to time management which is not in accordance with the time allocation as planned before. The period which was planned for the main part of the learning process was 45 minutes. However, it changed to 55 minutes due to the need of more time in reviewing the definition of quadratic equations, the relation of quadratic equations and quadratic functions, and in explaining the definition of resolving the quadratic equations. This unbalanced time allocation shorten the learners' time to discuss and solve the problems in the group discussion. Thus, it also lead to the lack of students' optimum ability in resolving the quadratic equations. According to the group discussion's report, the group was able to solve the problem well. However, the good results was dominated by the answers of one or two students in the group. It follows, the discussion process and sharing of the knowledge to master the ability had not been optimal due to the time constraints. Consequently, for the second cycle, the researcher should pay more attention to the allocation of time for each cycle. Besides, the researcher needs to ensure the learning process in the group can be done better.

However the percentage of students' mastery which was 43% did not reach the performance indicator, so that cycle two was needed. In the second cycle, the average scores of the post-test was 80.4, which was better than the average scores of pre-test that was 31.4. Nevertheless, the percentage of students' mastery of the post-test was 79% which still did not reach the performance indicator. Therefore, the research was continued to cycle three.



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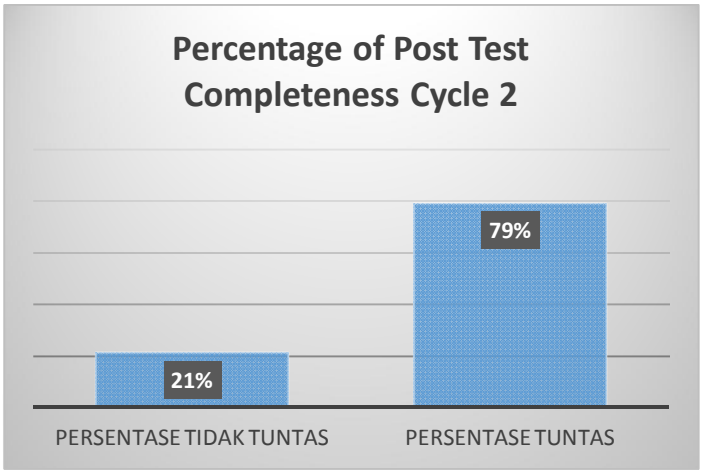
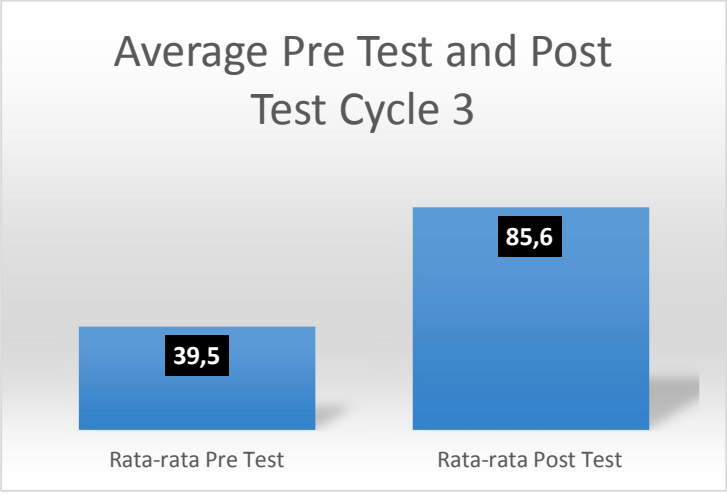


Figure 4.

After examining the pre-test and post-test results, the observer's notes, and the results of student reflection, the researcher reflects: (i) Learning process in accordance with the planned. Time allocation as planned. (ii) Student involvement in group work has been good, but there are still students who participate less actively and even sleep during lessons. (iii) Although the percentage of students' total score on post test increases compared to the percentage of post test

score in cycle 2, this increase has not yet reached the predetermined performance indicator. This means the research process goes into the third cycle with improvement plans on optimizing the active participation of students at all stages of the learning process. Teachers need to go around all the students to accompany and ensure all students learn actively. Also, the sitting position of the observer needs to be addressed. In cycle 1 and cycle 2 the three observers sit in groups in the right rear corner so as to close the teacher's path to reach the students in the back right corner. In cycle 3 the observer sitting position is planned to be separated, each in the right, middle, and left rear corner. This placement is in addition to facilitate the teacher to go around the classroom as well as for the attention and observation of the observer to all students become more optimal.

In the third cycle, the topic of learning materials is to solve quadratic equations using the factoring method. In the third cycle, the average scores of post-test was 85.6. It was better than the average scores of the pre-test that was 39.5. Moreover, the percentage of students' mastery of the post-test was 85%, which has reached the performance indicator. Considering this, the classroom action researched was accomplished.



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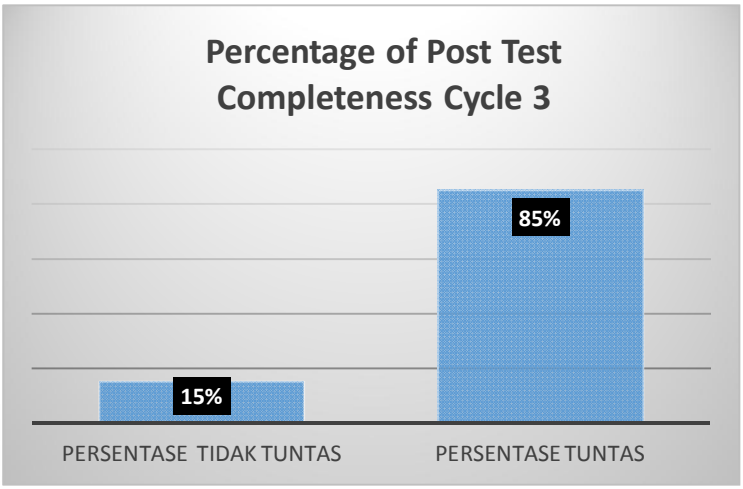

Figure 6.

After examining the pre-test and post-test results, the observer's notes, and the results of student reflection, the researcher reflects other points: (i) The overall learning process has been working very well. (ii) Students' involvement as an individual and also as a group has been excellent. (iii) All groups are guided and motivated so that all students are enthusiastic to follow the learning process. (iv) By having a good learning process and high student enthusiasm, the post-test result is better than the pre-test result and the percentage of the students' mastery of the post-test score is 85% which is more than 80% as specified in the performance indicator.

Conclusion

The performance indicator used in this research is the ability of learners in resolving the quadratic equation. It could be said that there is an improvement of learners' ability in resolving the quadratic equation if the average scores of post-test is better than the average scores of pre-test and more than 80% of learners achieved the post-test results above the minimum criteria of mastery learning that is 75. Based on the results from the first cycle until the third cycle, group discussion method is able to improve the ability of learners in resolving quadratic equations using the perfect quadratic method, the ABC formula, and the factoring.

Recommendation

Group discussion method as what has been studied in this classroom action research is highly recommended in the process of learning mathematics in the classroom. In addition to improving learning outcomes, group discussion method can also help students discuss the materials and learn together. Further, through group discussion method, students are able to share their knowledge, accept different thoughts and finally use the best thought for the sake of the group and their self-progress.

If teachers want to apply group discussion method to improve the students' achievement or to increase the learning outcomes, teachers should seriously prepare the groups that will work together during the learning process. Groups should be heterogeneous in terms of academic ability, background of learners, gender, the former junior high school (if the students are in class X) and other diversity.

In the learning process, the teacher should pay more attention by going around to guide each group so that each group and learners in the group surely work together in accordance with the signs or rules of the game that has been set.

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