

Efforts to Increase Self-Confidence Students Junior High School in Learning Mathematics with Discovery Learning Method

Lana Sugiarti^{1, a)}, Jailani²,

¹Graduate Program of Mathematics Education, Yogyakarta State University, Yogyakarta, Indonesia
²Mathematics Department, Faculty of Mathematics and Science, Yogyakarta State University, Yogyakarta, Indonesia

^{a)}lanasugiarti09@gmail.com

Abstract. The purpose of this research is to improve the self-confidence of grade VIIA Bopkri 1 junior high school in Yogyakarta province using discovery learning method. This type of research is a classroom action research. The study was conducted on students of class VIIA Bopkri 1 junior high school in Yogyakarta province with the number of students as many as 25 people in two cycles. Data collection is done by written test after applying discovery learning method and completed with questionnaire related with student self-confidence. Pre test and post test is done to know the students' self-confidence with discovery learning method. Data analysis was done by counting students' self-esteem improvement from test result and questionnaire, then continued with conclusion. The result of the research shows that the students' self-confidence improvement through the learning method of discovery learning in mathematics learning is 18,32% with the detail of confidence improvement for very high category that is from 8% to 36%, while for the high category from 28% to 56% for the medium category from 60% to 8%, and for the low category from 4% to 0%. In terms of cognitive (learning achievement) also increased from 44% to 72%.

Keywords: *self confidence, discovery learning, two cycles*

INTRODUCTION

Education is an important thing for humans because with education can direct or shape the human mindset in order to make various innovations and efforts to develop and advance all aspects of life. Mathematics education has a very important role because mathematics is a science used in various fields of life and at levels of education, ranging from basic education, elementary school, junior high school, senior high school, and university. In BNSP [1] it is seen that not only the cognitive aspect is the goal of learning mathematics, but the affective aspect also becomes the goal of learning mathematics, including the self confidence.

Self-confidence is one of the most important things for every student to have, because confidently allowing students to be more confident in their potential, it is not easy to give up and despair in dealing with every problem so that students are able to complete all the tasks given independently and with maximum results. This is supported by the opinion of Preston [2] who argues that “*your beliefs about your capacity to achieve, solve problems, and think for yourself. This is what I mean by confidence.*” The description implies that confidence is a person's beliefs about his ability to achieve a goal, solve problems, and think for himself.

Self confidence should not only be owned by adults but children also need it in the process toward maturity. Self confidence is hard to say in real terms, but it is likely that a confident person will be able to accept himself, ready to take on a challenge in the sense of trying something new even if consciously there is a possibility for wrong. People who have the confidence to complete the task in accordance with the stages of development well or at least have the ability to learn how to complete the task so as to foster courage and ability to improve achievement.

From the results of preliminary observations at 1 Bopkri junior high school, students' self-confidence in class VIIA is still quite average with an average of 70,48%. The percentage for very high criteria is absent (0%), high criterion 16%, criterion enough 48%, low criterion 36%, as well as very low criteria as much as 0%. From the data it is seen that there are still many students who have enough confidence and low. Whereas students who have low self-esteem will affect the learning achievement. Based on what has been submitted, then to overcome it required the role of teachers that affect the teaching and learning process. In the learning process, learning is expected to be interactive, inspirational, fun, challenging, motivating students to participate actively, and providing sufficient space for initiative, creativity, and independence according to students' talents, interests, and physical and psychological development [3]. To improve student self-confidence required a method of learning, where learning centered on student (student center) so that teacher only as facilitator. One of them with discovery learning method or more often called discovery-based learning method because the method is considered to make students active in learning and find and assemble their own solutions so that students' self-confidence can increase.

Discovery learning method aims to increase confidence and skills to learn the material to achieve optimal learning outcomes. The purpose of discovery learning method also has a great influence for students who some of them are: a) to develop creativity; b) to gain hands-on experience in learning; c) to develop rational and critical thinking skills; d) to enhance the learner's activity in the learning process; e) to gain innovation in the learning process [4]. Through this discovery learning method students can find concepts and principles through mental processes because the learning is designed in such a way that students can achieve optimal learning outcomes. There are several advantages of the method of discovery are: (1) students are active in learning activities, because he thinks using the ability to find the end result; (2) the student understands the true subject matter, for having experienced the process of finding it because something acquired in this way is longer remembered; (3) finds itself aroused by satisfaction because this inner satisfaction drives to make another discovery so that the learning desire increases; (4) students who acquire knowledge by discovery method will be better able to transfer their knowledge into various contexts; and (5) this method trains students to learn more by themselves [5].

The discovery learning method applied in junior high school is a guided discovery learning method. This is applied because junior high school students still need the help of teachers before becoming pure inventors. Based on the background of the above problem, the authors are interested to conduct research on students' self-confidence in relation to the process of learning mathematics with the title "Efforts to Increase Self-Confidence Students Junior High School in Learning Mathematics with Discovery Learning Method."

RESEARCH METHODS

In this study researchers used Classroom Action Research (CAR) types. The focus of this research is to improve self-confidence of the students of grade VIIA 1 Bopkri junior high school at Yogyakarta province in learning mathematics through Discovery Learning method. For the stages in this classroom action research was adopted from the Kemmis & Mc Taggart model and Jhon Elliot. The Kemmis & Mc Taggart [6] model consists of four steps: planning, action, observing and reflecting. However, after a cycle is completed, especially after the reflection is completed, followed by re-planning. The re-planning is done in a separate cycle and so next one cycle is followed by the next cycle followed by several cycles. As for the model Jhon Elliot [7] also has four steps classroom action research types above but this model is more detail in the implementation of each cycle. In the model of Jhon Elliot it is mentioned that each cycle is possible consists of several times of action (face to face) ie at least 3 times the meeting. Meanwhile, in each action the possibility consists of various steps that are realized in teaching and learning activities.

Based on the above two models, this research will be conducted in two cycles with classroom action research model consisting of four stages: planning, action, observing and reflecting. Classroom Action Research is implemented in 1 Bopkri junior high school at Yogyakarta province, Indonesia. The implementation of this research was held on November 2017 - December 2017 which the time of its implementation in accordance with the schedule of mathematics classes VIIA 1 Bopkri junior high school at Yogyakarta province that is every Thursday and Saturday.

Subjects in this classroom action research are students of grade VIIA 1 Bopkri junior high school consisting of 25 students. Prior to the research, the researcher observed first in the class VIIA and it is known that the students of class VIIA still not many dare to ask and present the learning result, although there are some students who have dared to present the learning result. In addition, in the VIIA class there are a variety of students from different backgrounds. This is known from brief questioning with some students in class VIIA.

This class action research will be carried out for the subject matter of the algebraic form. This study is planned to be implemented in two cycles. First cycle consists of 4 actions (meetings) while second cycle consists of 2 actions (meetings) and test. This study uses discovery learning. Technique of collecting data in this research is by test method, questionnaire and observation. The test method is used to collect student's cognitive learning

achievement data, the questionnaire method is used to collect the students' self-confidence data while the observation method is used to collect the instructional data of learning with the learning method of discovery learning, both the implementation of the learning by the teacher and the student activity. The success criteria of action:

Table 1. The success criteria of the study

| Variable | Interval | Criteria | Initial Conditions | Target |
|------------------|----------------------|------------------|--------------------|-------------|
| Self-Confidence | $100 < X$ | Very High | 0% | 20% |
| | $83,3 < X \leq 100$ | High | 16% | 52% |
| | $66,7 < X \leq 83,3$ | Medium | 48% | 28% |
| | $50 < X \leq 66,7$ | Low | 36% | 0% |
| | $X < 50$ | Very Low | 0% | 0% |
| | Average | Medium | 70,48 | High |
| Cognitif/Skill | Complete $\geq 75\%$ | Achieved | 16% | 75% |
| | Average | 70 | 63,6 | 78 |
| Learning Process | Done $\geq 95\%$ | Learning Success | | 95% |

Data analysis techniques taken from the data of observations of teachers and students, student achievement cognitive data, and student confidence data. Based on the calculation obtained table of confidence criteria as follows [8].

Table 2. Criteria of self confidence

| Interval | Score (X) | Criteria |
|---------------------------------------|----------------------|-----------|
| $M_i + 1,5S_i < X \leq M_i + 3S_i$ | $100 < X \leq 125$ | Very High |
| $M_i + 0,5S_i < X \leq M_i + 1,5S_i$ | $83,3 < X \leq 100$ | High |
| $M_i - 0,5S_i < X \leq M_i + 0,5S_i$ | $66,7 < X \leq 83,3$ | Medium |
| $M_i - 1,5S_i < X \leq M_i - 0,5S_i$ | $50 < X \leq 66,7$ | Low |
| $M_i - 3S_i \leq X \leq M_i - 1,5S_i$ | $25 \leq X \leq 50$ | Very Low |

RESULT AND DISCUSSION

1. Result of first cycle research

First cycle is divided into 4 meetings, each meeting lasting for 2×40 minutes while the evaluation is held once after 4 times the learning process takes place. The evaluation lasts for 40 minutes consisting of 10 multiple choice questions. the first cycle material about algebra. Activities in the first cycle consists of 4 stages, namely: stage of action planning, stage of action implementation, observation stage, and reflection stage. learning activity is done by preparing the implementation plan of learning, subject matter, test and assessment, questionnaire and observation sheet of teacher and student. There are some deficiencies in the first cycle learning:

- In closing activities, the activities of guiding students to reflect on the activities that have been done did not happen (happened at the first meeting). Student responses at first and second meetings are still there that have not been noticed and noisy in the classroom.
- In the core activities, giving the opportunity to other group members (for all members of the undeveloped group) to respond to the outcomes of the group presentations that advanced in front of the class did not take place (occurred in the second and third meetings).
- In the preliminary activity, apperception on algebraic material form, algebraic form allegations did not happen (happened at the fourth meeting).
- In the core activities, activities to provide guidance on the use of student worksheet has not been implemented (occurred in the second meeting and third meeting).

Table 3. First cycle evaluation results

| The number of students | | | Score | | | Percentage of mastery |
|------------------------|-----------------|------------|------------------|-------------------|---------------|-----------------------|
| Test participants | Score \geq 75 | Score < 75 | The lowest score | The highest score | Average grade | |
| 25 | 11 | 14 | 20 | 100 | 70,4 | 44% |

The average value of grade obtained in the first cycle is 70,4 with the percentage of students' learning mastery is 44%. This is obtained after repair because the initial results before repair only reach 36% student complete mastery. Self-confident students in learning mathematics for very high category have 8% percentage, high category 28%, medium category 60%, low category 4%, and very low category 0%. While for the average implementation of learning process first cycle that is equal to 85%. Based on the observation of the data obtained, the deficiencies that occur in the first cycle will be done remedial action in the second cycle that is:

- 1) Be more careful and understand the steps of learning activities in the lesson plan so it is endeavored to no one missed the steps.
- 2) Optimizing classroom management especially when discussing in groups.
- 3) Plan and prepare learning activities more closely and thoroughly, and pay attention to the points of preliminary, core, and closing activities in order to achieve optimally in the implementation of learning.

2. Result of second cycle research

The learning process in the second cycle takes place in two meetings. The meeting lasted for 2×40 minutes, while the evaluation lasted for 40 minutes at the third meeting with the number of questions is 5 multiple choice questions. The learning objectives to be achieved in the second cycle are: solve everyday problems related to algebraic form and resolving problems related to operations on algebraic form. Activity in this second cycle consists of 4 stages as in the first cycle.

Tabel 4. Second cycle evaluation results

| The number of students | | | Score | | | Percentage of mastery |
|------------------------|-----------------|------------|------------------|-------------------|---------------|-----------------------|
| Test participants | Score \geq 75 | Score < 75 | The lowest score | The highest score | Average grade | |
| 25 | 18 | 7 | 60 | 100 | 75,2 | 72% |

From the table above can be seen that the average value of the class obtained in cycle 2 is 75,2 with the percentage of students' learning mastery is 72%. While for students' self confidence in studying math in very high category has 36% percentage, high category 56%, medium category 8%, while for low category and very low 0%. While for the average implementation of the learning process of cycle II that is equal to 97%.

Performance indicators that researchers specify in this study has been achieved in terms of affective (because the studied is in affective aspect) that is the self-confidence of students it can be said that this research has succeeded so that research is sufficient until the second cycle.

The results obtained in the first cycle have not met the performance targets in this study. This is caused by several factors:

- 1) Teachers are less motivating students in apperception about algebraic forms.
- 2) Teachers have not asked for responses from each group member related to presentations by other groups.
- 3) Teachers do not invite students to reflect on the activities that have been done.
- 4) Teachers have not reminded students to learn the next material.

The learning process in the second cycle is done like the first cycle but the teacher makes improvements based on the deficiencies found in the first cycle. From the second cycle evaluation results obtained an average value of 75,2 with 72% complete learning. The average in the second cycle is higher than the first cycle as well as for the higher learning completeness of the second cycle. This indicates that

the learning process in the second cycle succeeded in improving student evaluation results. The results of this second cycle evaluation also have not met the target (not yet $\geq 75\%$) but because in this study aims to improve affective then the researchers assume that the cognitive aspect has been achieved / meet the target, but with the record is still a homework for teachers to improve student learning outcomes in the cognitive aspect.

While for the students' self-confidence in the second cycle, 36% were categorized as very high, 56% were in the high category, and 8% were in the medium category, for low category and very low 0%. The average questionnaire giving students confidence in the second cycle is higher than the first cycle. In the first cycle obtained 77,76% belonging to the category of being, while in the second cycle obtained 96,08% belonging to the high category. Because in this study aim to improve student affective that is increase student confident and target of mean of giving of confident inquiry of this research is high, and result of second cycle also high, hence this research say succeed. While for the average implementation of the second cycle learning process that is equal to 97%. Because the target in this study is 95% then in this second cycle research has met the target.

Tabel 5. Recapitulation of first and second cycle research results

| Variable | Interval | Criteria | Initial Conditions | Target | End of first cycle | End of second cycle |
|------------------|----------------------|-------------------------|--------------------|--------|--------------------|---------------------|
| Self-Confidence | $100 < X$ | Very High | 0,00% | 20,00% | 8% | 36% |
| | $83,3 < X \leq 100$ | High | 16,00% | 52,00% | 28% | 56% |
| | $66,7 < X \leq 83,3$ | Medium | 48,00% | 28% | 60% | 8% |
| | $50 < X \leq 66,7$ | Low | 36,00% | 0% | 4% | 0% |
| | $X < 50$ | Very Low | 0% | 0% | 0% | 0% |
| | Average | | Medium | 70,48 | High | 77,76 |
| Cognitif/Skill | Complete $\geq 75\%$ | Achieve | 16% | 75% | 44% | 72% |
| | Average | 70 | 63,6 | 78 | 70,4 | 75,2 |
| Learning Process | Done $\geq 95\%$ | Learning Success | | 95% | 85% | 97% |

From the table seen an increase in student confidence in the first cycle to second cycle of 77,76% to 96,08%. The learning process also increased from the first cycle of 85% to the second cycle of 97%. For the results of the evaluation learning average value increased from the first cycle of 70,4 to the second cycle of 75,2. The first cycle of basic competence is explaining algebraic forms and performing operations on algebraic forms (addition, subtraction, multiplication, and division) while for the second cycle the basic competence is solving problems related to algebraic forms and operations on algebraic forms.

CONCLUSION

Based on those discussed above, the success indicators in this study include self-confidence, learning completeness, and percentage of learning activities. In this study component percentage of learning implementation using discovery learning method with more than 95% for its success. Meanwhile, based on the components of student achievement, the expected target has been achieved. However, the students' learning completeness criteria are still not reached. However, in this case the researcher assumes that the answers to the problems raised in this study have been achieved, with the record still being a homework for teachers to improve student learning outcomes in the cognitive aspect. So the researcher concludes that learning mathematics using Discovery Learning method can increase self confidence of students of class VIIA 1 Bopkri junior high school in Yogyakarta province.

RECOMMENDATION

The results of this study can be used by the teacher as a reference of the use of learning methods to improve students' affective and cognitive, and can be used by students and readers to increase knowledge about the method of learning.

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