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IMPROVING MATHEMATICS ACHIEVEMENT OF INDONESIAN 5TH GRADE STUDENTS THROUGH GUIDED DISCOVERY LEARNING

Yurniwati[1], Latipa Hanum[2]

[1]Jakarta State University, Jl. Rawamangun Muka, Jakarta, Indonesia
[2]LPMP DKI Jakarta, Jl. Nangka 10, Tg. Barat, Jakarta, Indonesia
Email: yurniwati@unj.ac.id

Abstract

This research aims to find information about the improvement of mathematics achievement of grade five student through guided discovery learning. This research method is classroom action research using Kemmis and Taggart model consists of three cycles. Data used in this study is learning process and learning results. Learning process data is obtained by check list and is descriptive analyzed. Learning results data is obtained by conducting test and is analyzed by simple statistics. The result shows that student's ability of observation, discussion and knowledge acquisition are improved with guided discovery learning. Hence, guided discovery learning improves students' mathematics learning outcomes.

Keywords: *Mathematics Achievement, Guided Discovery Learning*

Abstrak

Penelitian ini bertujuan untuk mencari informasi tentang peningkatan hasil belajar matematika siswa kelas 5 SD melalui metode penemuan terbimbing. Penelitian ini berbentuk penelitian tindakan kelas menggunakan model Kemmis dan Taggart yang terdiri dari tiga siklus. Data penelitian terdiri dari data proses dan data hasil belajar. Data proses belajar diambil dengan check list dan diolah secara deskriptif. Data hasil belajar diperoleh melalui tes dan diolah secara statistiks sederhana. Hasil penelitian menunjukkan bahwa penemuan terbimbing dapat meningkatkan kemampuan observasi, diskusi dan perolehan pengetahuan. Pada akhinya metode penemuan meningkatkan hasil belajar siswa.

Kata kunci: Prestasi Belajar Matematika, Pembelajaran Penemuan Terbimbing

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Education is the place to obtain the knowledge and skills to face all the problems found in everyday life. Education is believed to be a process of the conversion of the attitude and prioritizing to be mature man. Education also can be interpreted as a conscious and planned to realize the atmosphere and learning to learners are actively developing personality, intelligence, morals and skills which required himself, community of the nation and state.

Elementary school as a formal education institutions held by the government and developed by national. The Government continuously improve the quality of national education include equipment and infrastructure, curriculum, school management and teaching materials, and the professionalism of teachers (Prahmana, Zulkardi, & Hartono, 2012). However the efforts of the government need to continue because its influence has not been evenly. There are elementary school which has not been good quality like SDN Lubang Buaya 13 Morning. Based on school data, the value of an average of the results of learning mathematics students in grade 3 and grade 4 in the last 2 years is 6.7.

Mathematics is the core subjects taught in all levels of education. Mathematics is the basic knowledge required by the students to higher education. In addition Mathematics also is not only about the operation of the numbers but also how to think, universal language, art and the appliance that has a purpose that is very close to the daily life (Reys, 2009; Prahmana & Suwasti, 2014).

The purpose of learning mathematics in elementary school is the students understand the concept of mathematics, using logic, make generalizations, problem solving and communicating ideas and have the attitude of appreciate the usefulness of mathematics in life. Because the Mathematics lessons in primary schools has not yet been able to establish and develop the capacity of the logic, critical thinking and problem solving so that the students mathematics achievements become low. It happened because the learning method is not appropriate. Teachers use expository method namely teachers explain the matter, provide examples and students following the passive learning (Supinah & Agus, 2009:19).

Expository method does not provide the opportunity for students to gain knowledge through experiences such as exploration and arrange the concept that makes reasoning, critical thinking and problem solving. Expository sometime is not appropriate with primary student's development. The characteristics of primary school students was understand the abstract concepts through concrete objects (Piaget in Seifert &Sutton, 2009:47). The students should have the opportunity and encouraged to interact actively with concrete objects or called teaching mathematics through experience (Orton, 2009:10). Besides that they are like moving, play in groups instead of sit quietly (Seifert &Sutton, 2009:42). This condition causes children feel uncomfortable and bored when they were told to sit and pay attention to the teachers.

Mathematics teaching in the elementary school is one of a very interesting study for discussion. This is caused by the existence of the basic differences between the characteristics of the Primary School age children who are concrete operational stage and characteristics of mathematics itself is abstract so required a special way to bridge the differences. Primary school students have been able to understand the logical operations with the help of concrete objects, while on the other hand, mathematics is a science deductive, asigmatic, formal, and hierarchy, abstract and symbolic. The system of mathematics is not in line with the development phase of mental children, so teacher have found the way to facilitate priory students to understand mathematics.

Therefore required teaching methods that can help children who have not been able to think deductive and learn through exploration and in groups to understand the mathematics. The method of learning in accordance with the primary school age children are learning methods that can accommodate the nature and characteristics of the children and to be able to develop and enhance the ability of children in terms of cognition, affective and psych motoric aspects.

One method of learning that can be use as the solution of the problem is Guided Discovery Method. According to Hanafiah (2010:77) guided discovery is a series of learning activities that involve students in the maximum attempts to seek, examine and investigate systematically, critical, and logical so that they can find their own knowledge, attitudes of insights and skills as the manifestation of the

change in himself.

The Guided discovery help students create and organize knowledge because involve students actively and understand based on the knowledge originally (Honomich & Chen, 2012:1). The discovery process makes mathematical concepts more easily understood and remembered in a long time by the students (Pujiastuti et al. 2014:59).

The discovery guided carried out in groups so that develop the potential of others in learning the interaction and simulation with the environment such as the experiment with teaching aids and discussion with friends in groups (Gijlers & de Jong, 2004: 280). The discussion that occurred in the group associated with the understanding of the concept of the theory and the new information. The discussion that happens is cognitive conflict and is believed to be the means to change the information.

For mathematics, Gijlers & de Jong (2005:181) proposed that mathematics more than the facts but mathematics is ideas and mental processes, mathematics can be understood well with find the idea. The discovery and verification is a process which is essential for the main purpose in learning mathematics. It is develop the capacity of the logic that is required in troubleshooting. .

The guided discovery principles consists of: (1) a problem that will be solved; (2) in accordance with the level of cognitive development students; (3) the concept or principle that must be found the students must be clearly written; (4) must be available on the appliance and the material used; (5) the order of the class arranged in such a way as to make it easier for involved free flow of mind students in teaching and learning activities; (6) teachers provide an opportunity to the students to collect data; (7) teachers give the information that is required of students (Mulyasa, 2008).

If the students are used to learning through guided discovery method so the students will have the ability to learn to gain knowledge itself is not receiving the knowledge. When they have not been able to show the ability to find the idea or the idea that meant, so teachers need to guide them. This causes the guided discovery is very suitable for primary school students because it gives an opportunity to the students to find and understand the concept in depth and then apply in the problem.

METHOD

This action research carried out on in 5^{th} Grades students at SDN Lubang Buaya 03 Pagi that is located on Jalan Rawa Binong, Cipayung, East Jakarta. This research carried out in the first semester of the school year 2013/2014.

This research applies the Classrom Action Research in three cycles. The purpose of Classroom Action Research is an attempt to repair a teaching practice through the gift of action in a class that begins with a lesson plan that was continued with classroom actions and reflection of the action. The implementation of this research is designed to follow the model of Kemmis and McTaggart i.e. planning, implementation of action, observation and reflection. The next cycle base on reflection.

The data consist of learning process and students' mathematics achievement. The learning process data contains the activities during mathematics teaching taken through observation sheet when

the implementation of the actions and analyzed by descriptive at the time of reflection. Students Mathematics achievement taken by test and analyze by simple statistics.

RESULTS AND DISCUSSION

Cycle 1

In cycle 1 student learn how to find trapezoid formula using origami. They have to cut the paper and arranged it into rectangle. Students worked in groups and at the beginning of the lesson, teachers let students to select the members of the group. There are 5 group consist of 5 -6 students. This makes the atmosphere of the classes are badly behaved and there are even students who do not have the groups. Then in learning process of using guided discovery method, the quality of teaching which is showed by the teachers and students not perfect. This is due to the implementation stages of the actions, students have not been able to understand the procedure independently. As a result the students have not been able to perform the discovery process trapezoid formula. In the process students still many rely on the direction and guidance from the teacher. This makes the teacher is still the main speakers are needed by each group that makes teachers become very overwhelmed.

When students finish working in groups, they have to presents their findings in front of class. But what happens is that they only write the answers in white board without explained it. There are also some children who do not enthusiastic and keep talking each other. Base on that fact, it can be concluded that the implementation of guided discovery has not yet been successfully implemented 100%.

The results of student learning also does not meet the target. Based on evaluation test still many students who have not yet been able to reach score 65. Only 27 of 42 students achieve more than 65. Based on this condition need the action on cycle 2.

Cycle 2

In general the activities in the cycle II is better, learning process has been more organized. But there is still some students have not yet been able to find formula of kite area. They still need direction and guidance from the teacher. So also on the stage of the presentation, there are still some groups that have not yet been able to present their finding and there has been no interaction between the precenter and the audience. Based on the above, we conclude that the quality of learning at cycle 2, still considered not successful. This is due to the steps of learning using guided discovery method not yet done with good.

The results of the evaluation test at cycle 2 shows a significant increase. From the test score, there are 32 from 42 students who succeeded getting score more than 65. This means that around 76 % students have been successfully absorb the subjects with good. But this data is still under the target so continue to cycle 3.

Cycle 3

The flaws that appear on the Cycle 1 and 2 is not shown at Cycle 3. Teachers have successfully created a pleasant classroom. Teachers also managed to motivate the students to have self confidence

to present the results of their work. Students who have an incorrect answer, will receive input from the teacher and there was interaction between the presenter, teachers and my classmates. Students who still play in the learning process is indeed still exist but teachers quickly remind and withdraw their attention. Still found students who have difficulties in answering the question of the exercise but teachers anticipate and discuss the questions together with the students until the end of the students understand and understand.

Data from evaluation test obtained in the Cycle 3 was 36 from 42 students or around 85 percent students have value score above 65. Only 6 students or 15% which still has a score below 65. While based on the results of these observations through action monitoring instrument sheet states the actions of teachers have achieved and has been in accordance with the principles of learning thoroughly (mastery learning). Therefore, research does not need to be continued on the next cycle because it has reached the desired target.

Overall the activity of teachers and students who obtained through observation of each cycle can be shown in Figure 1.

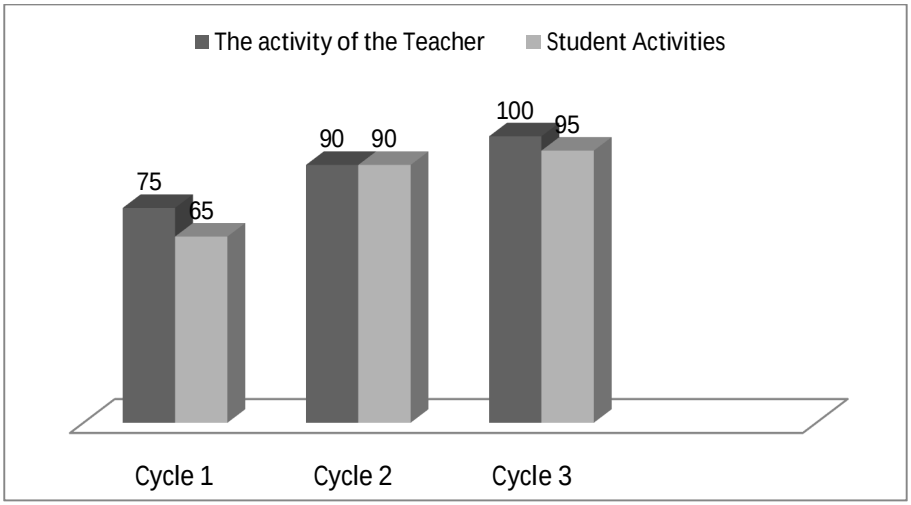

Figure 1. Presentation of the activities of the teachers and students

Based on Figure 1, the activity of teachers and students from the cycle I, II and III increased. The improvement occurs on the average teachers activities around 8.3% and students activities 10%. It looks little improvement, but both teachers and students showed positive work. Since the initial activities, teachers has been trying to prepare for the best possible start from studying the learning process, prepare the appliance and the required materials and trying to implement each of the steps is well planned. The core of the activity of the teachers in implementing this guided discovery learning activities is to provide an opportunity in the widest sense to students to search for and find learning goals independently but still in the guidance and direction of the teacher. While there is still a lack of, at cycle I teachers have been able to achieve success the high enough i.e. 75 %. This means that the teachers have been successfully implementing 15 stages learning from 20 stages planned. This gives the impact on the

activities of the students that since the beginning has reached 65% which means from 20 stages students learning activities have been successfully implementing 13 students with good activity. The table above shows that the success of students depending on the role of the teacher in facilitating, directing and guiding the students to perform each of the learning process and finally find their own knowledge

In addition, teacher performance have a positive impact on the student achievement. Based on the results of the tests on each cycle, the students achievement as follows in Figure 2.

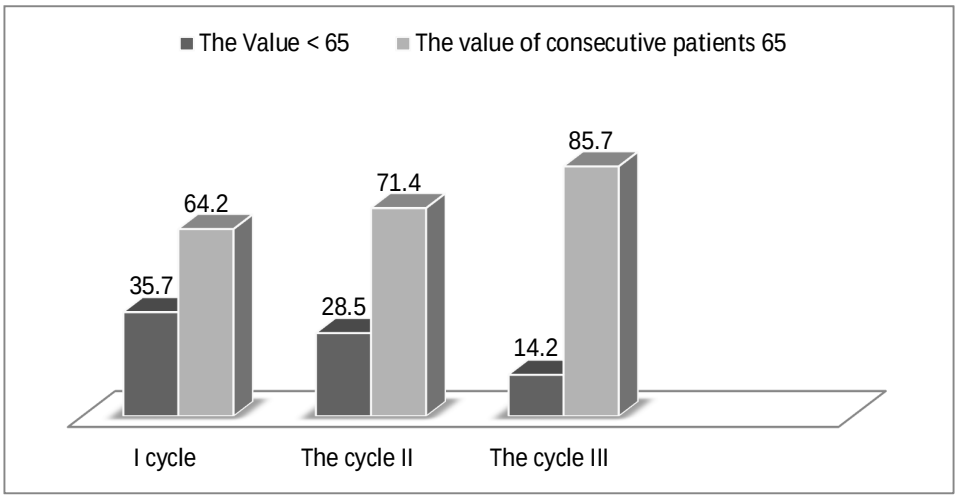

Figure 2. The results of student learning about the calculation of shapes

Based on Figure 2, improvements student learning about the calculation of shapes. Improvement occurs on the acquisition value students who achieve KKM. The improvement occurs quite significant i.e. 7.2 % from I cycle to the cycle II, and 14.3 % of the cycle II to the cycle III. The average increase of 8.75 %. Meanwhile, the opposite happens at acquisition value less students from KKM. At cycle I value is less than 65 high enough, namely reached 35.7%, but slowly down on the cycle II and cycle and become 28.5% and 14.2 %.

The habit of the students are learning in the individual makes the students' hard work in groups. Even when the division of the group problematic class into tumult and spend time. This issue is resolved after teachers determine the members of the group and limit the time to sit in the orderly in each group.

The independence of the students work in groups formed after teachers have successfully make the students to understand the work procedures first before starting the activity that was found in the worksheets. The working procedure is the activities to be done, the results of the work of the group will be collected, available time and discipline group work. In addition group activities supported by worksheets and teaching aids. Worksheets need to be well prepared by teachers to consider the suitability of the activities with the indicator in the development of children, teaching aids and the time required (Devi, et al. 2009:32). Besides teaching aids used should meet the criteria that is able to reach the indicator, easy-to-use, easily obtained and is not harmful to the students. Such as in the activities of formula kites students can use paper origami, paper owned or calendar former. Students to shear his

paper on some part then draw up the back so long square. So the formula of the wide kites obtained through the formula approach square.

At the end of each group work doing presentation of the work of the group in front of the class. The question and answer activities at the end of the presentation occurred after teachers getting students give comments or questions to renderers. In special cases communications including asking questions and give answers teachers need to provide an example. Afterwards the teacher asked the students to try to ask or give opinion or input.

CONCLUSION

The implementation of the discovery method gives many new capabilities to the students such as the skills of doing observation, discussion and conclusions and communication. The ability to significantly influence to the understanding of the mathematics students. Related to the extensive material flat field, students understand the origin of the equation and have the formula for its own sake. Then they can use the formula to complete the questions troubleshooting. Hence, it can be advanced that learning with the discovery of the method can improve the results of student learning.

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