

Model of Utilizing Discovery Learning to Improve Mathematical Learning Achievements

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ABSTRACT

The background of this classroom action research was to find out the low level of learning achievement of fourth grade students of SDN 2 Suban on Mathematics. This is because the learning model used is less attractive to students. The researcher conducted this study with the aim of analyzing the design of learning, the process of learning activities, learning models, and learning achievement of fourth grade students on Thematic subjects. Based on the fact that the student's learning outcomes are low, the writer conducts classroom action research with the intention of improving student learning outcomes. Collaborating with fellow writers trying to use the Discovery Learning model in learning carried out in the first cycle and second cycle, to improve the learning achievement of fourth grade students of SDN 2 Suban. The plan for improving learning through this research turns out that using the Discovery Learning model can improve student learning achievement. From the evaluation results, it can be seen that the percentage of learning outcomes of students who can achieve KKM with the acquisition of the percentage of pre-cycle 30%, cycle I 65%, cycle II 91%. Thus the author feels the need to master and use various learning models in each learning activity in the School.

Keywords: *Discovery Learning, Mathematics and Learning Achievement*

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INTRODUCTION

Education is an integral part of development. The educational process cannot be separated from the development process itself. Development is directed and aims to develop quality resources. Quality human beings can be seen in terms of education. This is contained in the goal of national education, that national education aims to educate the life of the nation and develop a whole person, besides having faith, fearing the Almighty God and being physically and mentally healthy also possessing abilities and skills.

The teaching and learning process is a process of interaction between students and teachers in order to achieve learning goals. Learning is an active process in acquiring new experiences or knowledge that causes changes in behavior. According to

Bell Gredler in Winataputra (2007: 5) learning is a process carried out by humans to get a variety of abilities, skills and attitudes.

Teaching is an active process of the teacher to guide students in learning and understanding the concepts developed in the teaching and learning process. Teaching is an effort to coordinate the environment with students and learning material, which raises the learning process in students. SDN 2 Suban which is addressed at Jl. Raya Suban, Merbau District, Mataram, has a low level of learning achievement, especially at grade IV. It is a problem that needs attention by the teacher who is in charge of the class. The level of learning achievement that is lacking and not in line with expectations requires an action to change in the learning process that is applied by the teacher. Related to the results of the observations carried out by the teachers, out of 23 students only 6 students whose grades were completed above the KKM. This is a problem that occurs in the classroom so the teacher must be able to change the learning process that takes place. The selection of the right learning model can help teachers to achieve goals in the implementation of learning. The teacher can use varied learning so students feel happy in following the learning. A varied learning model makes active students work together both emotionally and socially.

The model that can be used to improve student learning achievement is the Discovery Learning model. From the problems described above, the researchers agreed to conduct classroom action research by taking the title Efforts to improve learning achievement on thematic subjects using the Discovery Learning model of grade IV students at SDN 2 Suban. Hope is by conducting classroom action research using the Discovery Learning model the achievements of students in class IV can increase.

“Discovery learning can be defined as the learning that takes place when the student is not presented with subject matter in the final form, but rather is required to organize it himself” (Iefancois in Emetembun, 1986:103 in Dekdikbud 2014). Discovery Learning is a learning model developed based on constructivism. This model emphasizes the importance of understanding structure or important ideas towards a discipline, through active student involvement in the learning process. Discovery learning model is understood concepts, meanings, and relationships, through an intuitive process to finally arrive at a conclusion (Budiningsih, 2006:43).

According to Alma, et al (2010: 61) this discovery learning model has a basic strategy pattern that can be classified into four learning strategies, namely: (1) problem determination, (2) hypothesis formulation, (3) data collection and processing, and (4) formulating conclusions. According to the Ministry of Education and Culture (in the 2013 curriculum implementation teacher training material: 32), the steps of the discovery learning model are three stages consisting of preparation, implementation and evaluation. Using the discovery learning model is expected: Helping students to improve and improve cognitive skills and processes, Causing a sense of pleasure in students, Allows students to develop quickly and according to their own pace, Helping students strengthen their self-concept, because they gain trust in working with others,

Students and teachers play an active role in issuing ideas, Helping students eliminate skepticism or doubt.

Learning achievement According to Gagne in Dimyati and Mudjiono (2006: 10) learning is a complex activity and learning outcomes are tangible capabilities. Achievements students in besides being influenced by talent are also influenced by learning opportunities, the ability to understand the material and the quality of learning. Talent has to do with the basic conditions possessed for learning. The stages in learning depend on the learning phases. The stages of learning are: Acquisition, which is the stage of obtaining information. Storage, which is the stage of storing information. Retrieval, which is the stage of the information return approach (Asep Jihad and Abdul Haris, 2010: 1). Hereditary factors and the environment will affect the development and growth of students. Hereditary factors are factors that are inherited by their parents based on the equation of blood. Environmental factors also influence the development of participants, namely all conditions and situations that affect students from outside themselves. Parents can help the process of learning problems in various among others: Try to help children learn, for example how to do homework and other Discuss about school conditions and learning difficulties in general. Complete general education in formal schools with religious education in the family. Providing non-formal skills. Creating a family environment that will love learning (Sofyan S. Wilis, 2009: 175). Mathematics is a branch of exact science and is systematically organized about logical reasoning and problems related to numbers (Sujono in Hamzah, 2003:1). Mathematics has various meanings, depending on who applies it. Some understanding of mathematics include: 1) As a human activity and is an active, dynamic and generative process; 2) As a science that emphasizes deductive processes, logical and axiomatic reasoning, contains inductive processes in constructing conjectures, mathematical models, analogies, and generalizations; 3) As a structured and systematic science; 4) As aids in other sciences / daily life; 5) As a science that has an efficient symbolic language, a beautiful nature of order, the ability of quantitative analysis; 6) As a tool to develop critical thinking skills, as well as an open and objective attitude (Sumarmo, Utari). Based on some of the meanings that have been stated above, it can be concluded that Mathematics is a science that studies the quantities known through the process of calculation and measurement expressed by numbers or symbols.

RESEARCH METHODOLOGY

Repairs are carried out in the form of classroom action research to obtain the expected research results. This improvement activity is planned in two cycles. It is first cycle and second cycle. Implementation in each cycle includes planning, implementation, observation, data collection or instruments, and reflection. Note the following picture 1:



Picture 1. Classroom Action Research Procedure

As explained in the previous discussion, Classroom Action Research is intended to overcome the problems that exist in the classroom. Briefly the steps in each model consist of four components which are explained as follows:

Planning

Planning in this case is almost the same as if we prepare a teaching activity plan.

Implementation

This activity is a teaching and learning activity that uses a draft that has been prepared based on the purpose of improvement in the planned implementation of learning that has been previously designed.

Observation

At the observation stage the researcher monitors students during the learning process and assesses the results of student achievement in learning. The observer carries out observations on the implementation of improved learning so that shortcomings and weaknesses in learning activities can be identified and appropriate actions are taken to improve learning.

Reflection

Reflection is recalling what has been done. Based on the results of reflection, the teacher and colleagues conclude the actions that have been carried out whether they have succeeded or not.

Data collection technique

This study uses descriptive quantitative methods. The method of data collection is done in a way:

Documentation

In this study the method of documentation is taken from learning diaries, collaborator notes (research partners), student scores, and student progress notes in the learning process.

Observation

Observation method is carried out by looking at teaching and learning activities directly related to research. Observations were carried out in the school environment when the Mathematics learning was carried out. Observation is very helpful to be able to study the development of student activities and involvement in the process of learning Mathematics.

Test

The test method in this study is given in stages, after students follow the teaching methods delivered by the teacher concerned.

Data Analysis Technique

1. Quantitative technique is by managing the research data in the form of pre-cycle 1 and cycle 2 test results by tabulating the mean then determined above KKM and determined under the KKM

$$\frac{\text{Number of Students Graduated KKM}}{\text{Number of Students}} \times 100\%$$

2. Qualitative technique is to describe the condition of students, especially the discussion activities in the learning process, the validity of which is determined and then classified and finally interpreted from the data obtained. The Indicator for Achieving Completeness is good / very good and the norm of a good category is more than 80%. Learning achievement indicators in research by applying the Discovery Learning model in class IV of SD Negeri 2 Suban has a level of achievement, among others: 80% of students reach the level of activity, it can be concluded that achievement has increased. 80% of the number of students who exceed the minimum completeness criteria is 70, it can be categorized that students experience an increase in learning achievement.

RESULT AND FINDING

The process of learning activities conducted at SDN 2 Suban in grade IV which focuses on improving the achievement of degrees in Mathematics subjects has several stages to be able to know the changes in achievement in learning. The learning process carried out at each stage always experiences obstacles so that there needs to be improvement in the learning process. The learning results obtained in the pre-cycle stage can be seen in the table below:

Table 1. Completeness of Learning Pre-cycle Conditions

No.	Score	Test I	
		Number of Student	Percentage
1.	≥ 70	7	30
2.	< 70	16	70
Total		23	100

Source: student evaluation results

Based on the data in table 1 above, it is known that fourth grade students who have low scores than KKM 70, as many as 16 students. The percentage of students who have not reached KKM is equal to (70%), while those who have achieved completeness are only 7 students or equal to (30%). Based on the results of the pre cycle where the value of students has not yet achieved the completeness that has been set, the research will be conducted for the cycle I stage.

Based on the results of reflection carried out at the pre-cycle stage there are still shortcomings that need to be corrected such as the lack of utilizing the applied learning model. The findings that can be understood by researchers are the need for changes in the learning process. So from that researchers with partners agreed to be able to make improvements at the cycle stage I. The results of Cycle I can be seen in the following table:

Table 2. Completeness of Learning Pre-cycle Conditions

No.	Score	Test I	
		Number of Student	Percentage
1.	≥ 70	15	65
2.	<70	8	35
Total		23	100

Based on the data in table 2 above, it is known that fourth grade students who have low score than KKM 70, as many as 8 students. The percentage of students who have not reached KKM is equal to (35%), while those who have achieved completeness are only 15 students or equal to (65%). Based on the findings in the first cycle there are still shortcomings related to learning achievement.

The findings in this first cycle serve as a basis for further research to be carried out at the cycle II stage. At the stage of cycle II the researcher and partners make an agreement to make a learning process different from the previous learning process. The results of the research produced in the second cycle phase can be seen in the table below:

Table 3. Completeness of Learning Pre-cycle Conditions

No.	Score	Test I	
		Number of Student	Percentage
1.	≥ 70	21	91
2.	<70	2	9
Total		23	100

Based on the data in table 3 above, it is known that fourth grade students who have less scores than KKM 70, as many as 2 students. The percentage of students who have not reached KKM is equal to (9%), while those who have achieved completeness are only 21 students or equal to (91%). Based on the results of the research at the

second cycle stage, the results of a very significant increase can be obtained, related to these results, the researchers and partners decided to stop this study because the results of the study have reached the specified target, 80% of the students who completed the KKM.

The learning process carried out at SDN 2 Suban in class IV students using the Discovery Learning model with several stages that are passed through the learning process can be said to be successful. This success can be seen from each stage that changes the learning process so that student achievement can be said to increase. Learning using the Discovery Learning model is able to make students more attractive in following the learning process.

The learning process by implementing the Discovery Learning learning model is able to get students to get the targeted value in the KKM. Teachers and partners decide that with an increase in learning achievements using the Discovery Learning model is stopped at the cycle stage II, so that it can be said that the Discovery Learning model is very appropriate to be used in learning models in grade IV SDN 2 Suban. The results of the comparison at each stage can be seen in the table below:

Table 4. Comparison of student mastery learning

Number of students who complete the Pre-cycle	Number of students completed in Cycle I	Number of students completed in Cycle II
30%	65%	91%

Based on the results of the study, if the teacher uses the Discovery Learning model in Mathematics learning the student learning outcomes will increase. This can be proven by the progress of student learning outcomes after using the Discovery Learning model. This increase can be seen from the score and percentage of student scores from the above tables. From the table it is clear the difference from the pre-cycle conditions of students who complete 30%, in the first cycle reaches 65% of students who complete, and in the second cycle reaches 91% of students who complete or score above KKM.

CONCLUSION

Conclusions that can be drawn from this classroom action research include: The application of the Discovery Learning model can improve Mathematics learning achievement of fourth grade students at SDN 2 Suban. The increase in student learning outcomes that can be proven by the change in the level of completeness of learning where the pre-cycle level of completeness only reached 30% of the number of students 23 students with 7 students who completed, increased in the first cycle with a percentage reaching 65% with the number of students which completed 15 students, increased again in the second cycle reached 91% with a total of students who

completed reaching 21 students. The average score of student learning outcomes when compared to the initial conditions is only 61.09, after being given an average action value of students in the first cycle of 70.00 Whereas in the second cycle the average score reaches 78.04 with learning completeness reaching 91%.

REFERENCE

- Abu Ahmadi dan Widodo Supriyono. (2004). *Psikologi belajar*. Jakarta: Alfabeta.
- Alma, dkk. (2010). *Pembelajaran Kooperatif*. Jakarta: Dirjen.
- Aunnurahman. (2009). *Belajar dan pembelajaran*. Bandung: Alfabeta.
- Benny A. Pribadi. (2011). *Model assure untuk mendesain pembelajaran sukses*. Jakarta: Dian Rakyat.
- Budiningsih. (2006). *Blogspot Discovery Learning*. Diunduh 12 April 2020 dari [http://Akhmadsudrajat.wordpress.com/2008/01/12/Discovery Learning](http://Akhmadsudrajat.wordpress.com/2008/01/12/Discovery%20Learning)
- Dimiyati dan Mudjiono. (2006). *Belajar dan pembelajaran*. Jakarta: Rineka Cipta.
- Djamarah. (2002). *Proses Pembelajaran Mengajar*. Jakarta: Bumi Aksara. Jakarta: Rineka Cipta.
- Hamzah. (2003). *Pengelolaan pengajaran sebuah pengantar menuju guru profesional*. Jakarta. Rineka Cipta.
- Irawan Soehartono. (2008). *Metode penelitian sosial*. Bandung: Remaja Rosdakarya.
- Kemmis dan Taggart (2010). *Prosedur Penelitian Suatu Pendekatan Praktek*. Jakarta: Rineka Cipta.
- Mulyasa. (2004). *Kurikulum berbasis kompetensi*. Bandung: Remaja Rosdakarya.
- S. Nasution .(2009). *Kesempurnaan prestasi belajar*. Diambil tanggal 12 April 2020, dari <http://sunartombs.wordpress.com/2009/01/05/kesempurnaan-prestasi-belajar/>.
- Slameto. (2005). *Motivasi belajar dan faktor-faktor yang mempengaruhinya*. Jakarta: Rineka Cipta.
- Sofyan S. Wilis. (2009). *Konseling keluarga*. Bandung: Alfabeta
- Sugihartono, dkk. (2007). *Psikologi pendidikan*. Yogyakarta: UNY Press
- Sugiyono. (2009). *Metode penelitian tindakan kelas*. Bandung: Rosdakarya.
- Sukardi. (2004). *Metodologi penelitian pendidikan*. Jakarta: Bumi Aksara
- Syah. (2004). *Model Pembelajaran Kooperatif*. Panang: UNP.
- Tohirin. (2007). *Bimbingan dan konseling di sekolah dan madrasah*. Jakarta: Raja Grafindo Persada.
- Winata Putra. (2007). *Strategi pembelajaran berorientasi standar proses pendidikan*. Jakarta: Kecana.
- Winkel. (2009). *Bukti prestasi belajar*. Diambil tanggal 12 April 2020, dari <http://sunartombs.wordpress.com/2009/01/05/Bukti-prestasi-belajar/>.
- Yulikurnia. (2009). *Psikologi Pendidikan*. Jakarta : PT. Rineka Cipta.