

## APPLICATION OF THE DISCOVERY METHOD TO INCREASE MATHEMATICS LEARNING COMPLIANCE IN CLASS IIA STUDENTS SD NEGERI 0415 HUTA RAJA LAMA T.P 2020/2021

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**Abstract**, *This classroom action research was conducted at SD Negeri 0415 Huta Raja Lama in class IIA for the 2020/2021 academic year. Actions are taken by applying the discovery method to improve students' mathematics learning mastery. Discovery learning method is a learning method that can improve students' thinking skills to solve the problems they face. By using the discovery method, student learning completeness in each cycle changes and improves. This is evidenced by the achievement of pre-cycle test results, the average percentage is only 29.03% and at the end of the second cycle it reaches 87.10%. The application of the demonstration method can improve the competence of class II students SD Negeri 0415 Huta Raja Lama.*

**Keywords** : *Professionalism, Supervision, Individual.*

### I. INTRODUCTION

Mathematics learning achievement of class II students at SD Negeri 0415 Huta Raja Lama for the 2020/2021 school year has not been as expected because the average student achievement is still below the Minimum Completeness Criteria (KKM). Mathematics is one of the most feared subjects by students. Based on the results of observations in the classroom and data on student learning outcomes for grade II SD Negeri 0415 Huta Raja Lama, in the first semester of the 2020/2021 academic year, it is suspected that the causes of the problem are as follows: 1) Some students think mathematics is an uninteresting subject, difficult, and boring. 2)

Mathematics learning process is not conducive. 3) Teachers still often have difficulty in instilling basic mathematical concepts to students, especially in the concept of comparing numbers. 4) The learning method used is still teacher-centered.

This condition needs to be addressed immediately because it greatly affects the quality of schools. The purpose of school mathematics, specifically in Elementary School (SD) or Madrasah Ibtidiyah (MI) so that students have the following abilities: 1) Understand mathematical concepts, explain the interrelationships between concepts and apply concepts or algorithms, in a flexible, accurate, efficient, and precise manner, in

problem solving. 2) Using reasoning on patterns and traits, performing mathematical manipulations in making generalizations, compiling evidence, or explaining Mathematical ideas and statements. 3) Solving problems which include the ability to understand problems, design mathematical models, complete models and interpret the solutions obtained. 4) Communicating ideas with symbols, tables, diagrams, or other media to clarify the situation or problem. 5) Have an attitude of appreciating the benefits of Mathematics in life, namely having curiosity, attention, and interest in learning mathematics, as well as a tenacious and confident attitude in problem solving.

Teaching mathematics in schools has the aim of providing an illustration that learning is not only in the cognitive field but extends to the psychomotor and affective fields. Mathematics learning is directed to the formation of personality and the formation of thinking skills that rely on the nature of mathematics, this means that the nature of mathematics is the main element in learning mathematics. Therefore, the results of learning Mathematics show mathematical thinking abilities in students, which leads to the ability to use mathematics as a language and tool in solving problems faced in life. An achievement that cannot be ignored is the formation of a good and solid personality.

To realize the objectives of the Mathematics lesson, appropriate strategies and learning methods are needed. The discovery method is a student-centered method. The discovery method in student learning activities looks more active. In addition, students' reasoning power can be developed, especially for Mathematics.

Some characteristics of children at elementary school age that teachers must know, in order to better know the situation of students, especially at the elementary school level. As a teacher must be able to apply learning methods that are suitable for the circumstances of their students, it is very important for a teacher to know the characteristics of their students.

The formulation of the problem in this study is how to apply the discovery method to improve mathematics learning mastery in class IIA students of SD Negeri 0415 Huta Raja Lama T.P 2020/2021?. Meanwhile, the purpose of this research is to apply the discovery method to improve the mastery of learning mathematics in grade IIA students of SD Negeri 0415 Huta Raja Lama T.P 2020/2021.

Learning is a deliberate activity carried out by individuals so that there is a change in self-ability, by learning children who were previously unable to do something, become able to do something, or children who were previously unskilled become skilled. (M. Djauhar Siddiq, 2008 )

B.F. Skinner in Nabisi Laponi (2008: 5) that learning produces behavioral changes that can be observed, while behavior and learning are changed by environmental conditions..

Nana Sudjana (1987) Learning is neither memorizing nor remembering. Learning is a process marked by a change in a person. Changes as a result of the learning process can be shown in various forms such as changes in knowledge, understanding, attitudes and behavior, skills, abilities and abilities, reaction power, acceptance power and other aspects that exist in individuals. Bruner, through his theory reveals that in the learning process children should be given the opportunity to manipulate objects or teaching aids that are specially designed and can be tampered with by students in understanding a mathematical concept. Through the teaching aids they study, children will see firsthand how the regularity and pattern of structures contained in the object they are paying attention to. (Siti Hawa, et al., 2008) Learning is an effort made by someone (teacher or others) to teach students who are learning. In formal education (schools), learning is a task assigned to teachers, because teachers are professionals who are prepared for it. (M. Djauhar Siddiq, 2008).

From some understanding of learning above, it can be concluded that learning is an activity that can bring about changes in a

person's behavior, knowledge, skills, and attitudes due to interacting with the environment. A good learning environment is an environment that stimulates and challenges students to learn.

Learning Mathematics is one of the subjects that children fear in general because Mathematics is included in the subjects tested with national standards. Sutawijaya in Siti Hawa (2008) Mathematics examines abstract objects (mind objects) which are arranged in an axiomatic system using symbols (symbols) and deductive reasoning.

According to Hudoyo in Siti Hawa (2008) Mathematics is concerned with ideas, rules, relationships which are arranged logically so that Mathematics is related to abstract concepts. As a Mathematics teacher, in instilling one's understanding of learning Mathematics, the main thing is how to instill knowledge of concepts and procedural knowledge. Mathematics subjects need to be given to all students starting from elementary school to equip students with the ability to think logically, analytically, systematically, critically, and creatively, as well as the ability to work together.

These competencies are needed so that students can have the ability to obtain, manage, and utilize information to survive in conditions that are always changing, uncertain, and competitive. To master and

create technology and the ability to think logically, analytically, systematically, critically, and creatively in the future, it is necessary to have a strong mastery of mathematics from an early age and learning that makes students learn and become meaningful (Sitihawa et al., 2008).

Wiji Suwarno (2009) Complete learning is a learning strategy that can be implemented in the classroom with the assumption that under the right conditions all students will be able to study well and obtain maximum results on the teaching materials being studied. In order for all students to obtain maximum results, learning must be carried out systematically. Systematism will be reflected in the learning strategies implemented, especially in organizing the objectives and teaching materials, as well as carrying out evaluations and providing guidance to students who fail to achieve the goals that have been set.

Learning objectives must be organized specifically to facilitate checking learning outcomes. While teaching materials need to be translated into certain learning units, and complete mastery of materials for all purposes of each learning unit is required of students before the learning process moves to the next stage.

Evaluation is carried out after students complete a certain learning activity which is the basis for obtaining feedback.

The main purpose of the evaluation is to obtain information about the achievement of objectives and mastery of students' materials. The results of the evaluation are used to determine where and in what ways students need to get guidance in achieving goals, so that all students can achieve their goals and master teaching materials to the maximum (complete learning).

Sund in Soli Abimanyu et al., (2008) argues that discovery is a mental process in which students assimilate a concept or principle. Meanwhile, according to Sund, inquiry includes discovery. In other words, inquiry is an extension of the discovery process that is used more deeply. This means that the inquiry process contains a higher level of mental processes, for example: formulating problems, designing experiments, conducting experiments, collecting data, analyzing data, draw conclusions, and so on. Finally, Sund argues that the use of the discovery method is good for low grade students, while inquiry is good for high grade students. Thus discovery is defined as a learning procedure that emphasizes individual learning, object manipulation, conducting experiments, before arriving at generalizations. The discovery method prioritizes active student learning), process-oriented, self-directing, self-seeking, and reflective.

The purposes of using the discovery method include: a) To obtain learning methods that are in accordance with the material and learning objectives that have been set. b) To enable students to learn according to the material and learning objectives. c) To vary the learning methods used so that students do not get bored. d) So that students can find their own, investigate themselves, and solve the problems they are learning on their own, so that the results are loyal and long-lasting in memory, and are not easily forgotten.

The steps for implementing the method of the invention are: a. Preparatory Activities: 1) Identify students' learning needs (need assessment) 2) Formulate learning objectives. 3) Prepare the problem (lesson material) to be solved. The problem is stated in the form of a statement or question. The problem about the concept or principle that will be found needs to be written clearly. 4) Prepare the necessary tools and materials. b. Discovery Implementation Activities. 1) Opening Activities. a) Perform apperception, which is asking questions about the subject matter that has been taught. b) Motivating students with short stories that have to do with the material being taught. c) State the learning objectives and activities/tasks carried out to achieve the learning objectives. 2) Core Activities. a) State the problem to be answered through discovery activities. b)

Briefing discussion on how to carry out the discovery/solution of the problems that have been determined. c) Implementation of discovery in the form of investigation/experimental activities to find concepts or principles that have been set. d) Assist students with information or data, if required by students. e) Helping students to analyze the data found, if needed. f) Stimulate the interaction between students and students. g) Praise students who are active in carrying out inventions. h) Give students the opportunity to report their findings. 3) Closing Activities. a) Ask students to summarize their findings. b) Evaluating the results and the discovery process. c) Follow-up, namely asking students to re-discover if they have not mastered the material, and asking students to do enrichment assignments for students who have made good discoveries.

## **II. RESEARCH METHODS**

The implementation of learning improvements was carried out in class I SD Negeri 0415 Huta Raja Lama. This Classroom Action Research takes place from August to September 2020. The research is classroom action research. The implementation of learning is carried out during the learning process and is carried out in 1 pre-cycle and 2 repair cycles.

This type of research is Classroom Action Research (CAR). Suharsimi Arikunto (2007) suggests that Classroom Action Research is an examination of learning activities in the form of an action, which is intentionally raised and occurs in a class together. Then Wijaya Kusumah and Dedi Dwitagama (2010) stated that CAR is a research conducted by teachers in their own class by planning, implementing, and reflecting on collaborative and participatory actions with the aim of improving teacher performance so that student learning outcomes can increase.

Wina Sanjaya (2011) defines CAR as a process of studying learning problems in the classroom through self-reflection in an effort to solve these problems by carrying out various planned actions in real situations and analyzing any effects of the treatment. Suharsimi Arikunto (2007) explains that in collaborative research, the party who takes the action is the class teacher itself, while the researcher who observes the ongoing process of action is the researcher. This classroom action research was conducted with the aim of improving student learning outcomes through Realistic Mathematics Learning in Mathematics learning. The classroom action research used in this study refers to the Kemmis & McTaggart Model which consists of four components, namely planning, acting, observing and reflecting.

The explanations for the four components are 1) Planning. In this stage, the researcher explains what, why, when, where, by whom, and how. Planning in this study includes: a. Researchers determine how to improve student learning outcomes by using Mathematics Learning Realistic in learning Mathematics b. Researchers prepare lesson plans (RPP) c. Researchers prepare observation sheets regarding teacher and student activities during learning 2) Acting. Action is the implementation or application of the design content, namely using class actions. The teacher must remember and obey what has been formulated in the design but must act fairly and not artificially. The implementers of the action in this study were classroom teachers and researchers as observers. 3. Observing (Observation). Observations (observations) were carried out by researchers during Mathematics learning by using observation sheets that had been prepared in advance. Observations in the process of learning activities using the Realistic Mathematics Learning approach were carried out by researchers. These activities are carried out to collect data that will be processed to determine the actions that will be carried out by the next researcher. 4) Reflecting (Reflection). Reflection is an activity to see the various shortcomings carried out by the teacher to

further identify things that still need to be done in the next cycle.

## **II. RESEARCH RESULTS AND DISCUSSION**

The Classroom Action Research (CAR) for Cycle I was completed in August 2020. The results of the implementation of Cycle I were detailed as follows: After the teacher (researcher) made a Learning Implementation Plan (RPP) using the discovery method, it was submitted to the principal and supervisor. In general, the lesson plans that have been made are good and suitable to be used for learning activities. However, there are several things that need to be revised, including: a) The learning objectives still have words that have not been operational, namely understanding. Example: Students can understand how to add two numbers consisting of two digits without storing techniques correctly. Then the word understand is told to remove. b) Initial activity, the researcher has not included the activity "The teacher invites students to pray, prepares the tools needed in learning." The action taken by the teacher for learning "Doing addition and subtraction of numbers up to 500" is by using the discovery method. Before delivering the learning material, the teacher conditions the students to be ready for learning. The teacher invites students to

pray, prepares the tools needed in learning. The teacher motivates students about the importance of learning Mathematics. The teacher holds questions and answers about many objects in the classroom with the hope that students can count the objects directly. After students are really in a condition ready to learn, the teacher conveys the learning objectives to be achieved.

In the core activity, the teacher explains how to write number symbols and read number symbols. The teacher asks students to take turns to count the number of objects that have been prepared by the teacher. To foster student activity, the appointment of students is done randomly. Students write the number of objects that have been counted on the blackboard. After students master count many objects, then the teacher asks questions about the addition of two numbers. In order to answer these questions, the teacher gives students the opportunity to think so that they can find the answer. The ways that students do it vary, some use their fingers, some use a broom stick, and some use stones. Students are divided into several groups. In group discussions, the teacher distributes Student Worksheets (LKS) and then works in groups. The teacher and students conclude the results of the class discussion.

At the end of the learning activity, the teacher reaffirms the method or steps for adding two numbers. The teacher provides

another opportunity for students who do not understand to ask questions. After students understand it, the teacher conducts a learning evaluation. The evaluation sheet is done individually and is not allowed to ask friends. The results of student work are collected after the time is up. To close the lesson, the teacher gives homework assignments and motivates them to study hard at home.

Observations were carried out by class II teachers (researchers) together with supervisors. The supervisor's task is to observe the activities of teachers and students during the learning process. Based on the supervisor's observations, the implementation of learning activities in general is good because the teacher has been able to activate the students. Students feel happy with the discovery method. Students can find their own way of adding two numbers. Students are very enthusiastic about listening and observing the teacher's explanation. The interaction between teachers and students is well established. This can be seen from the activeness of students in answering some of the questions asked by the teacher. In addition, students are also actively asking the teacher about learning materials that have not been understood. Interaction between students is also well established. The group leader can help group members who do not understand. Student Worksheets and

Evaluation Sheets are good to use as measurement tools.

Some things that need to be improved in learning activities are: in the initial activities, the teacher still feels tense in opening learning, the language used by the teacher is still regional so that there are students who do not understand. In the main activity, especially during group discussions, the teacher has not mastered classroom management because at the back there are several students who are busy themselves. Teachers should not focus on just one group.

The teacher (researcher) conducts an evaluation and reflection of the planning, implementation, and observation activities that are collaborated with colleagues. At this reflection stage, it is expected to find weaknesses and strengths during the learning process so that it can be used to improve further learning.

In Cycle I, qualitative and quantitative data were obtained. Which includes qualitative data, namely: Student Activity Sheet (attached). While quantitative data is the value of student learning outcomes. The value of student learning outcomes is obtained through a written test. The test instrument used is a short entry. Data on student learning outcomes as shown in the table below:

Table 1. Cycle I . Test Value

No	Student Code	Value
1	S1	70
2	S2	70
3	S3	80
4	S4	65
5	S5	70
6	S6	80
7	S7	70
8	S8	70
9	S9	70
10	S10	70
11	S11	60
12	S12	80
13	S13	60
14	S14	80
15	S15	70
16	S16	60
17	S17	80
18	S18	60
19	S19	60
20	S20	60
21	S21	60
22	S22	60
23	S23	70
24	S24	80
25	S25	65
26	S26	80
27	S27	60
28	S18	90
29	S29	65
30	S30	60
31	S31	60

Based on the data above, it can be seen that the number of students is 31 children, the total score is 2,135, the average student score is 79.07, the highest score is 90, the lowest score is 60. Students completed as many as 17 (54.84%) students and students did not complete 14 (45.16%) student.

Class Action Research (CAR) for Cycle I was completed in August 2020. The details of the activities are as follows: 1.

Action Planning . After the teacher (researcher) makes a Plan for Improvement of the Learning Implementation Plan (RPP) using concrete learning media, then it is submitted to the principal and supervisor. The results of the RPP assessment that have been carried out by the principal and supervisor are good and can be continued for learning implementation activities. 2. Implementation of Actions. The actions taken by the teacher for the implementation of learning in cycle II are improving and enhancing the learning process. Based on the constraints and problems that emerged in the first cycle, the researchers tried to solve the problem by: a. Teachers must prepare themselves both physically and mentally, there is no need the awkward feeling of teaching is awaited by the principal and supervisor. To attract students' attention, the teacher can invite students to sing a song. b. At the time of learning, students should be accustomed not to go to the toilet and it is recommended to go to the toilet only during breaks. c. Taking pictures (photos) should be attempted by students not knowing it.

Before delivering the learning material, the teacher conditions the students to be ready for learning. The teacher invites students to pray, prepares the tools needed in learning then a question and answer session is held about many objects in the classroom with the hope that students can

count the objects directly. After that, the teacher conveys the learning objectives to be achieved.

In the core activity, the teacher demonstrates how to add numbers without storing techniques and with storing techniques. Expressing the problem to be answered through discovery activities. Briefing discussion on how to carry out the discovery / problem solving that has been determined. The implementation of the discovery is in the form of an investigation/experimental activity to find a predetermined concept or principle. Assist students with information or data, if required by students. Helping students to analyze the findings of the data. Stimulate the interaction between students and students. Praise students who are active in carrying out inventions. Give students the opportunity to report their findings.

At the end of the learning activity, ask students to summarize the results of their discoveries, evaluate the results and the discovery process, follow up, that is, ask students to re-invent if they have not mastered the material, and ask students to do enrichment assignments for students who have made good discoveries. , the teacher ends the activity and changes to the next lesson. 3. Observations were carried out by class II teachers (researchers) and school principals as supervisors. The supervisor's task is to observe all teacher

and student activities during the learning process. Based on the supervisor's observations, the implementation of learning activities is generally good and the learning objectives can be achieved. In addition, there has been an increase when compared to the implementation of learning in the first cycle, especially in classroom management. Students are more active, seem happy, and do not feel pressured. The interaction between teachers and students is well established. This can be seen from the activeness of students in answering some of the questions posed by the teacher. 4. Reflection. The teacher (researcher) conducts an evaluation and reflection of the planning, implementation, and observation activities in collaboration with the Research Supervisor. The data used to reflect in the form of qualitative and quantitative data. Qualitative data were taken from supervisor observations while qualitative data were in the form of students' daily test results. The results of students' daily tests in cycle II are as shown in the table below:

Table 2. Value of Cycle II

No	Student Code	Value
1	S1	80
2	S2	80
3	S3	90
4	S4	70
5	S5	80
6	S6	90
7	S7	80
8	S8	90
9	S9	80

10	S10	80
11	S11	70
12	S12	90
13	S13	60
14	S14	80
15	S15	80
16	S16	60
17	S17	80
18	S18	60
19	S19	80
20	S20	90
21	S21	70
22	S22	90
23	S23	60
24	S24	90
25	S25	80
26	S26	80
27	S27	90
28	S18	80
29	S29	70
30	S30	80
31	S31	80

Based on the data above, it can be seen that the number of students is 31 children, the total score is 2,440, the average student score is 90.37, the highest score is 90, the lowest score is 60. Students completed as many as 27 (87.10%) students and students did not complete 4 (12.90%) student.

After learning takes place and seeing the results obtained by students from each cycle, it can be explained as follows: Judging from the results of the data on the learning pre-cycle, it is still not successful because many students get scores below the standard and the average value is only 62.57, students who are active 9 children (29.03%) students who are not active 22 children (70.97%). This happens because during the learning process, the author uses

the lecture method more, so students get bored quickly. Moreover, grade 1 students who still like to play alone. Based on these findings, the writer needs to change the learning strategy, which is no less important is the improvement of literacy and numeracy skills (calistung). Changes in learning methods will be implemented in the improvement of learning I/cycle I

In the first cycle, students have made progress in learning, namely the average score obtained by students is 79.07, more students are active 17 children (54.84%) students are not active 14 children (45.16%) the more students are active active because this learning is felt by children to be fun, even though there has been an increase, the author hopes that the desired completeness can be even better. Therefore, the writer needs to correct himself personally in the learning process. Finally, the author made improvements again by pressing the use of learning strategies to find partners optimally in the next lesson.

This learning improvement was carried out in cycle II with the hope that it would be clearer in understanding the learning material about the unit of measurement of time regarding the order of the names of the days and the results of completeness would increase even more.

After carrying out the second cycle, it turned out to improve learning outcomes

and students became clearer in the results of applying the material, it was proven that the average value increased from 79.07 to 90.37 so that the completeness reached 87.10% of students. They tried to quickly match question cards and answer cards, so the efforts made by the author were quite good and this improvement was stopped here. There are still 4 students who have not finished this is because these students cannot read and write correctly so they cannot answer questions or match question cards with answer cards.

From this description, there are benefits from improving learning with demonstration learning strategies including:

- The student learning process has played an active role.
- Students in looking for pairs of question cards or answers seemed excited and excited to find their partner immediately.
- The average yield of the cycle is always increasing.

## II. CONCLUSION

The use of the discovery method can increase students' creativity because by using the discovery method it is possible to develop active student learning. In addition, the knowledge found by themselves through the discovery method will be truly mastered, and easy to use/transfer in other situations, students can master one of the scientific methods that are very useful in

their lives, students are accustomed to thinking analytically and trying to solve problems to be transferred. in community life.

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