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# IMPROVING SCIENCE LEARNING ACHIEVEMENT ABOUT VARIOUS TYPES OF OBJECTS THROUGH EXPERIMENTAL METHODS IN CLASS IV ELEMENTARY SCHOOL STUDENT

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**ABSTRACT**

*This research is a Classroom Action Research which was conducted in class IV of SD Negeri Setiadarma 04, Tambun Selatan District, Bekasi Regency. The purpose of the study is to improve science learning achievement about various forms of objects in grade IV students of SD Negeri Pondok Kacang Timur 03 Semester 1 of 2015/2016 through experimental methods.The use of the experimental model can improve student learning outcomes in science subjects, the subject of various material forms for class IV semester I, SD Negeri Setiadarma 04, Tambun Selatan District, Bekasi Regency, in the 2015/2016 academic year, this is indicated by an increase in learning outcomes, namely the learning process before the action shows low learning outcomes, namely students whose grades met the KKM as many as 13 students or 37%, students who had not completed 21 students or 61% with the highest score of 90 and the lowest score of 40. In cycle I the number of students who completed 21 students or 61% while those who had not completed 13 students or 39%. The minimum score is 50 and the maximum score is 90. In cycle II there is an increase in learning outcomes, namely the number of students' completeness is 32 students or 94%. Minimum score of 70 and maximum value of 100. Thus it can be concluded that using the experimental method can improve student learning outcomes in science subjects.*

**KEYWORDS** *Science; learning achievement; experimental methods*



## INTRODUCTION

In essence teaching and learning activities are a process of interaction or reciprocal relationship between teachers and students in learning units (Loilatu et

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al., 2021). The teacher as one of the components in the teaching and learning process is a very important role holder (Izhar, 2016). The teacher is not just a conveyer of material, but more than that the teacher can be said to be the center of learning.

As a regulator as well as actors in the teaching and learning process, it is the teacher who directs how the teaching and learning process is carried out. Therefore the teacher must be able to make teaching more effective as well as interesting so that the subject matter delivered will make students feel happy and feel the need to learn the lesson material (Nurrita, 2018).

The teacher carries out a tough task to achieve the goals of national education, namely to improve the quality of Indonesian people, whole human beings who believe in and fear God Almighty, have noble character, personality, discipline, work hard, tough, responsible, independent, intelligent and skilled and physically and mentally healthy, must also be able to foster and deepen a sense of love for the motherland, strengthen the national spirit and sense of social solidarity. In line with that, national education will be able to realize human development and build itself and be responsible for nation building (Hospita, 2021).

The success of learning objectives is determined by many factors including the teacher's factor in carrying out the teaching and learning process, because teachers can directly influence, foster and improve students' intelligence and skills (Fitriyah & Warti, 2017). To overcome the problems above and to achieve educational goals to the fullest, the role of the teacher is very important and it is expected that the teacher has a good teaching method/model and is able to choose the right learning model and in accordance with the concepts of the subjects to be delivered (Canned, 2020).

The aim of national education as contained in Law Number 2 of 1989 is to educate the life of the nation and develop Indonesian people who believe in and fear God Almighty and are virtuous, possess knowledge and skills, are physically and spiritually healthy, have a solid and independent personality and national social responsibility (Hermanto, 2020).

In science subjects at elementary schools, especially at Pondok Kacang Timur 03 Public Elementary School, there are still many difficulties. This can be seen from the low scores in science subjects compared to the scores of several other subjects seen from the results of the daily test where 22 out of 34 students did not reach the KKM. Starting from the above, it is necessary to have thoughts and actions that must be taken so that students do not experience difficulties in learning science concepts, so that the specific learning objectives set by science subject teachers can be achieved properly and the results can satisfy all party. Therefore the use of learning methods is considered very important to help students understand science concepts.

There are various types of learning methods, each of which has advantages and disadvantages, so the selection of a method that is appropriate to the topic or subject to be taught must really be thought of by the teacher who will deliver the subject matter (Setyorini et al., 2023).

To improve student achievement in science lessons, especially in the discussion of the introduction of various types of objects in grade IV students at

Pondok Kacang Timur 03 Public Elementary School, the experimental method was selected. The experimental method is a method commonly used in exact sciences such as biology, physics or other natural sciences (Fauziah, 2022). However, it should be remembered that the social science research method is also known as the experimental method to explain a phenomenon. The experimental method is a method of providing opportunities for individual or group students to be trained in carrying out a process or experiment (Hastuti & Hidayati, 2018).

The experimental method is a teaching method that uses certain methods and is carried out more than once. The use of this technique has the goal that students are able to find and find answers or problems themselves by conducting their own experiments (Hadiyati & Wijayanti, 2017). Also students can be trained in a scientific way of thinking. With experiments students find evidence of the truth of the theory of something they are studying

With the use of the experimental method it is hoped that it can increase student activity in the teaching and learning process so that in the teaching and learning process the activities are not only dominated by the teacher, thus students will be involved physically, emotionally and intellectually which in turn is expected to understand the concept of changing objects taught by the teacher by students (Mulyadi, 2018). In accordance with the problems above, this study aims to find out the increase in science learning achievement regarding various forms of objects in Class IV SD Negeri Pondok Kacang Timur 03 Semester 1 of 2015/2016 through the experimental method.

Besides that, this research is expected to be useful: (1) for students to increase their understanding of the concept of science about various forms of objects with experimental methods, (2) for teachers to provide additional enrichment in teaching methods with the help of experimental methods so that learning objectives can be achieved properly, and (3) for institutions it can be used as input material for information about an alternative way of learning science for students by using the experimental method.

## RESEARCH METHOD

This study uses Classroom Action Research (CAR). According to the PGSM Project Trainer Team, PTK is a form of reflective study by the perpetrators of actions carried out to increase the rational stability of their actions in carrying out tasks, deepen understanding of the actions taken, and improve the conditions in which the learning practices are carried out (Nurizzati & Nurjati, 2014).

In accordance with the type of research chosen, namely action research, this research uses the action research model from Kemmis and Taggart, namely in the form of a spiral from one cycle to the next cycle. Each cycle includes plan, action, observation, and reflection. The steps in the next cycle are revised plans, actions, observations, and reflections (Ruhani, 2020). Before entering cycle 1, a preliminary action is carried out in the form of problem identification.

1) Initial design/plan, before conducting the research the researcher formulates the problem, objectives and creates an action plan, including research instruments and learning tools.
2) Activities and observations, include actions taken by researchers as an effort to

build students' understanding of concepts as well as observing the results or impacts of applying experimental model learning methods.

3) Reflection, the researcher examines, sees and considers the results or impacts of the actions taken based on the observation sheet filled in by the observer.
4) Revised plans/plans, based on the reflections of observers
5) make a revised design to be implemented in the next cycle.

The observation was divided into three rounds, namely rounds 1, 2 and 3, where each round was subjected to the same treatment (same activity flow) and discussed one sub-topic which ended with a formative test at the end of each round. Made in three rounds intended to improve the teaching system that has been implemented.

**Data Collection Methods**

***Data Collection Techniques***

The data collection technique used in this study consisted of 2 techniques, namely the observation technique and the test technique.

Observation Techniques

Observations were made during the learning activities taking place using observation sheets that were made to be used as data collection devices. The things that were observed included:

Observation of lesson plans.
Observation of the learning process.
Observation of the results obtained by students after the action is taken.

Test Technique

The test technique is carried out at the end of the learning activity using a question sheet.

***Data Collection Tools***

Data collection tools used in this study are: (1) test items, (2) observation sheets, in the form of observations of lesson plans, observations of the learning process, and observations of the results obtained by students after taking action.

**Data Analysis Techniques**

Data analysis techniques used are both quantitative and qualitative. Furthermore, to analyze the data, the results of the actions taken by the author are presented in stages according to the sequence of cycles that have been carried out, while the data processing procedure is as follows

***Data Selection***

The data that has been collected from the results of observations during research activities is carried out by selecting data that has something to do with the research objectives.

***Data Classification***

The data collected by selection is classified based on a logical order to be presented systematically based on the order of the cycle.

***Percentage of Data***

The final stage of the data analysis technique, carried out the percentage of data for data that has been collected based on classification.

## RESULT AND DISCUSSION

### Description of Research Subjects

The SD Negeri Pondok Kacang Timur 03 Public Elementary School is led by a Principal, the teaching staff of SD Negeri Pondok Kacang Timur 03 consists of: 1 Principal as the person in charge assisted by teaching staff consisting of 17 class teachers, 3 Islamic religion teachers, 2 sports teachers , I Wiyata English teacher, 4 school caretakers, 2 administrative staff, 1 library staff.

The number of students at SD Negeri Pondok Kacang Timur 03 starting from grade I to grade VI is 567 students. With different talents, abilities, skills. The majority of students and SD Negeri Pondok Kacang Timur 03 are Muslim. This research was conducted at SD Negeri Pondok Kacang Timur 03 with 34 class IV students as research subjects.

### Research Implementation

The research was conducted at SD Negeri Pondok Kacang Timur 03 class IV with a total of 34 students. The research time consisted of 2 cycles, each cycle consisting of 1 meeting with an allotted time of 2 x 35 minutes.

### Conditions Before Action

The initial condition is the state of the students before the classroom action research is carried out. Based on the results of observations made in class IV SD Negeri Pondok Kacang Timur 03 in the 2015/2016 academic year, with a total of 34 students in science learning, it can be seen that student learning outcomes are still low. This can be seen from the results of the evaluation of students in science subjects that have been carried out where most of the students obtained scores below the Minimum Completeness Criteria ~ 70. In the results of the daily test before the research was carried out, the following values were obtained:

**Table 1. List of Value Results of Pre-Cycle Evaluation**

| No | Name | Score/ average | Completeness | |
|---|---|---|---|---|
| | | | Complete | Incomplete |
| 1 | Adelia Putri | 40 | | V |
| 2 | Aida Permatasari | 50 | | V |
| 3 | Amelia Agustin | 70 | | V |
| 4 | Andika Prasetya | 70 | | V |
| 5 | Dede Rizki | 60 | | V |
| 6 | Delia Mulyani | 50 | | V |
| 7 | Desiyana Chairani | 70 | | V |
| 8 | Dodi Surrachman | 80 | V | |
| 9 | Duan Firdaus | 40 | | V |
| 10 | Dwi Iindah Purnama | 80 | V | |
| 11 | Gilang Jiliansyah | 60 | | V |
| 12 | Hans Muller Linggi | 70 | | V |
| 13 | Helsa Muhadi | 80 | V | |
| 14 | Imanuel Rizki | 80 | V | |
| 15 | Indra Setiawan | 70 | | V |
| 16 | Jhonatan Agustinus | 80 | V | |
| 17 | Klavera Stari Diwit | 90 | V | |
| 18 | Lani Nurafah | 90 | V | |

| No | Name | Score/ average | Completeness | |
|---|---|---|---|---|
| | | | Complete | Incomplete |
| 19 | M.Indra | 80 | V | |
| 20 | M. Latief Abdilah | 80 | V | |
| 21 | Nadia Fitri Aulia | 70 | | V |
| 22 | Nanda Aulia.A | 80 | V | |
| 23 | Puput Sesri | 90 | V | |
| 24 | Ragil Azis | 90 | V | |
| 25 | Rama Iswardika | 80 | V | |
| 26 | Rega Wulandari | 80 | V | |
| 27 | Rifan Ahmad A | 70 | | V |
| 28 | M. Khairul Islam | 80 | V | |
| 29 | Rizal Firmansyah | 90 | V | |
| 30 | Rizkan Febriansyah | 90 | V | |
| 31 | Rizqi Saskia.A | 70 | | V |
| 32 | Roby Kusuma | 80 | V | |
| 33 | Ulya Kusyanti | 90 | V | |
| 34 | Vivi Rianti | 90 | V | |
| Total | | 1230 | | |
| Completeness | | 38% | | |
| Incomplete | | 62% | | |

Thus the data obtained from student learning outcomes before the research action is carried out, can be seen in table 2 below:

**Table 2. Distribution of Learning Completeness of Class IV Semester II Students of SD Negeri Setiadarma 04 Before Action**

| No | Mark | Completeness | Before Action | |
|---|---|---|---|---|
| | | | number of students | Percentage |
| 1 | ~70 | Incomplete | 13 | 38% |
| 2 | ~70 | Complete | 21 | 62% |
| Amount | | | 34 | 100% |
| Average value | | | 65 | |

Based on table 1, it is clear that the students who achieved mastery learning (KKM = 70) were 13 students (38%) while students who had not achieved learning mastery were 21 students (62%). The highest value is 90 while the lowest value is 40. For more details, the value data in table 2 can be diagrammed as shown in Figure 1.

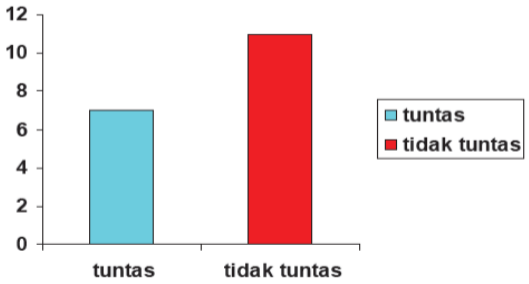


**Figure 1. Completeness distribution diagram for Class IV Semester 1 students Pondok Kacang Timur Public Elementary School 03 2015/2016**

After further investigation, it turned out that 13 students who had not completed it had the disadvantage of not being able to grasp the learning material conveyed by the teacher using the lecture method, the use of the lecture method resulted in students being sleepy, not enthusiastic in answering teacher questions and that was all different from 21 people who could grasp the material. learning by using the lecture method.

The results of the learning completeness of SD Pondok Kacang Timur 03 Public Elementary School students before the action is taken can be seen that students who have scores less than the minimum completeness criteria (KKM: 70) are 21 students or 62%, while those who have achieved minimum completeness are 13 students with a percentage of 38%.

Obtained data on student learning outcomes that are still low and grade IV students at SD Negeri Pondok Kacang Timur 03 Semester I of the 2015/2016 Academic Year, the author will conduct a Classroom Action Research (CAR) in accordance with the research design described in the previous chapter. In research at Pondok Kacang Timur 03 Public Elementary School, Tambun Selatan District, Bekasi Regency, the author will use experimental learning methods to improve student learning outcomes in class IV SD Negeri Pondok Kacang Timur 03, which will be carried out in two cycles. By using experimental learning methods in each study.

**Cycle 1**

***Action planning***

Action planning in cycle 1 consists of one planning meeting, namely the cycle I meeting

Based on the results obtained at the observation stage that had been carried out at Pondok Kacang Timur 03 Public Elementary School, researchers collaborated with class IV teachers by conducting discussions about the learning material to be presented as well as the learning model Experimental methods used in learning activities, especially in class IV semester I on the science lessons before carrying out teaching activities at the first meeting, the teacher prepares everything that can support the student learning process.

The teacher designs a Learning Implementation Plan (see Appendix) for the subject of science about various forms of objects with the learning objective: to improve student achievement in science lessons with the subject of various forms of objects. Then the teacher presents a motivating learning experience, namely by carrying out learning activities Experimental methods with learning steps as follows:

1) Students are divided into 6 groups, each student in the group gets a name or group number.
2) The teacher conducts learning about various forms of objects and gives experimental examples.
3) The teacher gives experimental assignments and each group does it.

4) The group discusses the correct answer and ensures that each group member can do/know the answer.
5) The teacher calls a number. The student with the number called reports the results of the group's work and the other groups respond.

Teachers also need to prepare learning media equipment, namely experimental tools in the form of candles, paper, matches, camphor and companion books. At the end of learning the teacher evaluates using objective tests and description tests. The reasons for the U-shaped arrangement of classrooms are:

1) Learning activities use experiments to form group chairs making it easier for teachers to communicate and supervise.
2) Communication is also directed to the teacher so that students' concentration is more focused in listening to the teacher's explanation.

***Implementation and Observation of Actions***

The implementation and observation stages in cycle I consisted of one meeting, where the first meeting lasted 70 minutes (two hours of lessons).

1) Initial activity
   Implementation at the first meeting the teacher opened the lesson The teacher opened the lesson by greeting, introducing, praying, attending students, setting the atmosphere in the classroom and asking how the students were doing. Then convey the learning objectives and learning steps that will be carried out.
2) Core activities
   Students listen to the teacher's explanation about various forms of objects accompanied by interesting examples and interesting words and styles so that students will seriously listen and not get bored. Furthermore, the implementation of learning using an experimental model by dividing students into 6 groups, each group consisting of 5 students. Students in groups listen to experimental procedures and do group assignments. Students do science experiments according to the teacher's instructions. The teacher interacts actively and communicates with each group giving a little direction and instructions for groups who do not understand the learning material. After all the groups have done the task the teacher calls one of the groups randomly to present the results of their group's experiment and the other groups respond and so on so that all groups present their experimental results. then the teacher confirms the results of the exploration and elaboration of students in written form.
3) Closing Activities
   Together with students make a summary of the lesson. Conduct an assessment of the results of observations that have been carried out by students in groups. Provide feedback on the process of learning outcomes.

   In the learning phase of cycle I, meeting I, which is currently underway, the practitioner asks for the help of an Observer (grade IV teacher) to observe the course of learning. Experimental method from the beginning to the end of learning by filling in the observation sheet (see attachment) provided by the practitioner. The observation sheet includes points that are in accordance with

the experimental method of learning to observe all activities carried out by the practitioner.

***Reflection***

And the results of these observations can be known what are the weaknesses and strengths during learning takes place. Lack of students in learning, among others, the readiness of students in participating in learning is still lacking, students' activeness in answering questions is still lacking, students are good enough to pay attention to explanations and teachers. only some students were active in group experiments, only some students could answer questions, only a small number of students could properly present the results of their group experiments. While the advantages of students in learning include that most students respond to other groups' answers, some students can already conclude from the material that has been studied. some students are serious in following the lesson, All students can work on evaluation questions without copying friends' answers. As for the deficiencies in the first meeting which have been repaired, they will be carried out in cycle II

**Table 3. Data from Observation Results of Cycle I actions**

| No | Activity | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1 | Pre Learning | | | | |
| | 1. The teacher compiles lesson plans | | | v | |
| | 2. Designing an experimental learning model. | | | v | |
| | 3. Compileassessment | | | v | |
| | 4. compileobservation instrument | | | v | |
| 2 | Implementation | | | | |
| | Initial activity | | | | |
| | 1. Fill out the class list, pray, prepare teaching materials, models, teaching aids. | | | | v |
| | 2. Arranging seats. | v | | | |
| | 3. Collecting assignments/ homework | | | v | |
| | 4. The teacher conveys the learning objectives | | | v | |
| | 5. The teacher does apperception | | v | | |
| | 6. Teacher motivate students | | v | | |
| | Core activities | | | | |
| | 1. The teacher gives an explanation to students about the learning material | | | v | |
| | 2. The teacher divides students into several groups. | | | v | |
| | 3. The teacher gives an experimental example about the various forms of objects | | | | |
| | 4. The teacher asks each group to do an experiment according to the example. | v | | | |
| | 5. The teacher gives instructions to groups of students who still do not understand and communicate with each group. | | v | | |
| | 6. Each group reads their work in front of the class | | | v | |
| | | | v | | |
| 3. | Closing | | | | |
| | 1. The teacher asks questions about things that students do not know | | | | v |

| No | Activity | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 2. | The teacher and students ask and answer to correct misunderstandings, provide reinforcement and conclusions | | v | | |
| 3. | Students and teachers reflect. | | v | | |
| 4. | The teacher gives an evaluation. | v | | | |
| | Amount | | | | |
| | Percentage (%) | | | | |

Information :
1. If the statement is carried out in the less category
2. If the statement is carried out in the sufficient category
3. If the statement is carried out in the good category
4. If the statement is carried out in the very good category.

Based on table 3 of the first cycle of learning using the experimental method learning model, the observer obtained an assessment with a very good category of 10%, a good category of 45%, an adequate category of 30% and a poor category of 15%. In the activities carried out there are still deficiencies, namely in the problem of student apperception, in giving experimental examples the teacher is too fast so that students do not understand, in arranging seats not neatly and conducting evaluations.

At the end of the first cycle of learning, an evaluation was carried out using objective tests and description tests with the following results:

**Table 4. List of Value Results of Cycle I Evaluation**

| No | Name | Score/ avergae | Completeness | | Treatment | |
|---|---|---|---|---|---|---|
| | | | complete | incomplete | Refinement | Enrichment |
| 1 | Adelia Putri | 50 | | V | V | |
| 2 | Aida Permatasari | 60 | | V | V | |
| 3 | Amelia Agustin | 80 | V | | | V |
| 4 | Andika Prasetya | 80 | V | | | V |
| 5 | Dede Rizki | 60 | | V | V | |
| 6 | Delia Mulyani | 50 | | V | V | |
| 7 | Desiyana Chairani | 60 | | V | V | |
| 8 | Dodi Surrachman | 80 | V | | | V |
| 9 | Duan Firdaus | 60 | | V | V | |
| 10 | Dwi Iindah Purnama | 80 | V | | | V |
| 11 | Gilang Jiliansyah | 60 | | V | V | |
| 12 | Hans Muller Linggi | 80 | V | | | V |
| 13 | Helsa Muhadi | 90 | V | | | V |
| 14 | Imanuel Rizki | 90 | V | | | V |
| 15 | Indra Setiawan | 80 | V | | | V |
| 16 | Jhonatan Agustinus | 80 | V | | | V |
| 17 | Klavera Stari Diwit | 90 | V | | | V |
| 18 | Lani Nurafah | 90 | V | | | V |
| 19 | M.Indra | 80 | V | | | V |
| 20 | M. Latief Abdilah | 90 | V | | | V |
| 21 | Nadia Fitri Aulia | 90 | V | | | V |
| 22 | Nanda Aulia.A | 80 | V | | | V |
| 23 | Puput Sesri | 80 | V | | | V |
| 24 | Ragil Azis | 90 | V | | | V |
| 25 | Rama Iswardika | 90 | V | | | V |

| No | Name | Score/ avergae | Completeness | | Treatment | |
|---|---|---|---|---|---|---|
| | | | complete | incomplete | Refinement | Enrichment |
| 26 | Rega Wulandari | 80 | V | | | V |
| 27 | Rifan Ahmad A | 90 | V | | | V |
| 28 | M. Khairul Islam | 90 | V | | | V |
| 29 | Rizal Firmansyah | 80 | V | | | V |
| 30 | Rizkan Febriansyah | 80 | V | | | V |
| 31 | Rizqi Saskia.A | 90 | V | | | V |
| 32 | Roby Kusuma | 90 | V | | | V |
| 33 | Ulya Kusyanti | 90 | V | | | V |
| 34 | Vivi Rianti | 90 | V | | | V |
| Total | | 1330 | | | | |
| Completeness | | 61% | | | | |
| Incomplete | | 38% | | | | |

**Table 5. Distribution of learning completeness**

| No | Mark | Completeness | Cycle I | |
|---|---|---|---|---|
| | | | Number of students | Percentage |
| 1 | ~70 | Incomplete | 13 | 38% |
| 2 | ~70 | Complete | 21 | 61% |
| Amount | | | 34 | 100% |
| Average | | | 73.8 | |

From the results of the reflection of the first cycle which has deficiencies, namely students in learning, among others, the readiness of students in participating in learning is still lacking, students' activeness in answering questions is still lacking, students are good enough to pay attention to explanations and teachers only some students are active in experiments carried out in groups, only some students could answer the questions, so a lesson plan for cycle II was prepared and it was hoped that the researcher would correct the deficiencies so that the implementation of the next lesson would be better.

## Cycle II

### *Action planning*

Based on the results of cycle I, there were deficiencies and successes in Cycle I. Learning planning in Cycle II was carried out as a refinement and follow-up and deficiencies that occurred in Cycle I. The implementation of Cycle II was carried out 1 meeting, the learning activities in Cycle II were still the same as Cycle But what distinguishes it is that the learning activities include different experimental materials. This is intended so that students can get a better picture of the various forms of objects.

The teacher designs a Learning Implementation Plan (see Appendix) for the subject of improving student achievement in science lessons with the subject of various forms of objects and their changes: After listening to the teacher's explanation of changes and carrying out experiments it is hoped that student achievement will increase. Then the teacher presents a motivating learning

experience, namely by carrying out learning activities Experimental methods with learning steps as follows:

1) Students are divided into 6 groups, each student in the group gets a name or group number.
2) The teacher conducts learning about various forms of objects and gives experimental examples.
3) The teacher gives experimental assignments and each group does it.
4) The group discusses the correct answer and ensures that each group member can do/know the answer.

The teacher calls a number. The student with the number called reports the results of the group's work and the other groups respond. Teachers also need to prepare equipment such as appropriate experimental media and supporting books. At the end of learning the teacher evaluates using objective tests and description tests.

***Implementation of Observations and actions***

In cycle II this is used as a follow-up and improvement of learning activities in cycle I, cycle II lasts 70 minutes (2 hours of lessons).

1) Initial activity
   Implementation at the first meeting the teacher opened the lesson The teacher opened the lesson by greeting, introducing, praying, attending students, setting the atmosphere in the classroom and asking how the students were doing. Then convey the learning objectives and learning steps that will be carried out.
2) Core activities
   Students listen to the teacher's explanation about various forms of objects accompanied by interesting examples and interesting words and styles so that students will seriously listen and not get bored. Furthermore, the implementation of learning using an experimental model by dividing students into 6 groups, each group consisting of 5 students. Students in groups listen to experimental procedures and do group assignments. Students do science experiments according to the teacher's instructions. The teacher interacts actively and communicates with each group giving a little direction and instructions for groups who do not understand the learning material. After all the groups have done the task the teacher calls one of the groups randomly to present the results of their group's experiment and the other groups respond and so on so that all groups present their experimental results. then the teacher confirms the results of the exploration and elaboration of students in written form,
3) Closing Activities
   Together with students make a summary of the lesson. Conduct an assessment of the results of observations that have been carried out by students in groups. Provide feedback on the process of learning outcomes.

In the learning phase of cycle II that is currently underway, the practitioner asks for the help of an Observer (grade IV teacher) to observe the course of the experimental method from the beginning to the end of the lesson by filling out the

observation sheet (see attachment) provided by the practitioner. The observation sheet includes points that are in accordance with the experimental method of learning to observe all activities carried out by the practitioner.

***Reflection***

From the results of these observations it can be seen what are the weaknesses and strengths during the learning process. Lack of students in learning, among others, the readiness of students in participating in learning is still lacking, the activeness of students in answering questions has increased, students are good enough to pay attention to explanations and teachers. Most of the students were active in learning, only some students could not answer questions, a small number of students did not want to present their work. Another advantage of students in learning, among other things, that most students respond to answers brought by their friends, some students can already conclude from the material that has been studied. Most of the students are serious in participating in learning, all students can work on evaluation questions without copying friends' answers. There was an increase in the value of learning cycle II. The results of cycle II learning can be seen in the table below:

**Table 6 . Data from Observation Results of Cycle II actions**

| No | Activity | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 1 | Pre Learning | | | | |
| | 1. The teacher compiles lesson plans | | | v | |
| | 2. Designing experimental models | | | v | |
| | 3. Compileassessment | | | v | |
| | 4. compileobservation instrument | | | v | |
| 2 | Implementation | | | | |
| | Initial activity | | | | |
| | 1. Filling out class lists, praying, preparing teaching materials, models, teaching aids. | | | | v |
| | 2. Arranging seats. | | | v | |
| | 3. Collecting assignments/ homework | | | v | |
| | 4. The teacher conveys the learning objectives | | | v | |
| | 5. The teacher does apperception | | | v | |
| | 6. Teachermotivate students | | | v | |
| | Core activities | | | | |
| | 1. The teacher gives an explanation to students about the learning material | | | | v |
| | 2. The teacher divides students into several groups. | | | | |
| | 3. The teacher gives an experimental example aboutabout the various forms of objects | | | | v |
| | 4. The teacher asks each one group to carry out experiments according to the example. | | | v | v |
| | 5. The teacher gives instructions to groups of students who still do not understand and communicate with each group. | | | v | |
| | 6. respectively respectively group read results his work in front of the class | | | v | |
| 3. | Closing | | | | |
| | 1. The teacher asks questions about things that students do not know | | | | v |

| No | Activity | 1 | 2 | 3 | 4 |
|---|---|---|---|---|---|
| 2. | The teacher and students ask and answer to correct misunderstandings, provide reinforcement and conclusions | | | v | |
| 3. | Students and teachers reflect. | | v | | |
| 4. | The teacher gives an evaluation. | | | v | |
| | Amount | 0 | 1 | 14 | 5 |
| | Percentage (%) | 0% | 10 % | 70 % | 25 % |

Information :

1. If the statement is carried out in the less category
2. If the statement is carried out in the sufficient category
3. If the statement is carried out in the good category
4. If the statement is carried out in the very good category.

Based on table 4.6 of the second cycle of learning using the experimental method learning model obtained an assessment by observers with a very good category of 25%, good category of 70%, sufficient category of 10% and less category of 0%. There have been many improvements in the activities carried out.

At the end of cycle II, an evaluation was carried out using objective tests and description tests with the following results:

**Table 7. List of Value Results of Cycle II Evaluation**

| No | Name | Score/ average | Completeness | | Follow-up | |
|---|---|---|---|---|---|---|
| | | | complete | Incomplete | Repair | enrichment |
| 1 | Adelia Putri | 80 | V | | | V |
| 2 | Aida Permatasari | 80 | V | | | V |
| 3 | Amelia Agustin | 80 | V | | | V |
| 4 | Andika Prasetya | 80 | V | | | V |
| 5 | Dede Rizki | 80 | V | | | V |
| 6 | Delia Mulyani | 70 | | V | V | |
| 7 | Desiyana Chairani | 80 | V | | | V |
| 8 | Dodi Surrachman | 80 | V | | | V |
| 9 | Duan Firdaus | 80 | V | | | V |
| 10 | Dwi Iindah Purnama | 90 | V | | | V |
| 11 | Gilang Jiliansyah | 90 | V | | | V |
| 12 | Hans Muller Linggi | 80 | V | | | V |
| 13 | Helsa Muhadi | 100 | V | | | V |
| 14 | Imanuel Rizki | 100 | V | | | V |
| 15 | Indra Setiawan | 80 | V | | | V |
| 16 | Jhonatan Agustinus | 80 | V | | | V |
| 17 | Klavera Stari Diwit | 100 | V | | | V |
| 18 | Lani Nurafah | 100 | V | | | V |
| 19 | M.Indra | 100 | V | | | V |
| 20 | M. Latief Abdilah | 100 | V | | | V |
| 21 | Nadia Fitri Aulia | 80 | V | | | V |
| 22 | Nanda Aulia.A | 80 | V | | | V |
| 23 | Puput Sesri | 100 | V | | | V |
| 24 | Ragil Azis | 100 | V | | | V |
| 25 | Rama Iswardika | 100 | V | | | V |
| 26 | Rega Wulandari | 100 | V | | | V |
| 27 | Rifan Ahmad A | 80 | V | | | V |
| 28 | M. Khairul Islam | 80 | V | | | V |
| 29 | Rizal Firmansyah | 100 | V | | | V |
| 30 | Rizkan Febriansyah | 100 | V | | | V |

| No | Name | Score/ average | Completeness | | Follow-up | |
|---|---|---|---|---|---|---|
| | | | complete | Incomplete | Repair | enrichment |
| 31 | Rizqi Saskia.A | 80 | V | | | V |
| 32 | Roby Kusuma | 80 | V | | | V |
| 33 | Ulya Kusyanti | 100 | V | | | V |
| 34 | Vivi Rianti | 100 | V | | | V |
| Amount | | 1530 | | | | |
| Completeness | | 94% | | | | |
| Not finished | | 6% | | | | |

**Table 8. Distribution of learning completeness**

| No | Score | Completeness | Cycle II | |
|---|---|---|---|---|
| | | | The number of students | Percentage |
| 1 | ~70 | incomplete | 2 | 6% |
| 2 | ~70 | complete | 32 | 94% |
| Amount | | | 34 | 100% |
| Average | | | 85 | |

**Results of Data Analysis**

***Cycle I***

Research analysis after using the experimental method in science learning obtained the following learning outcomes:

**Table 9. Distribution of learning completeness of Class IV studentsPondok Kacang Timur Public Elementary School 03 Cycle I**

| No | Score | Completeness | Cycle I | |
|---|---|---|---|---|
| | | | The number of students | Percentage |
| 1 | ~70 | Incomplete | 13 | 38% |
| 2 | ~70 | Complete | 21 | 61% |
| Amount | | | 34 | 100% |
| Average value | | | 73.8 | |

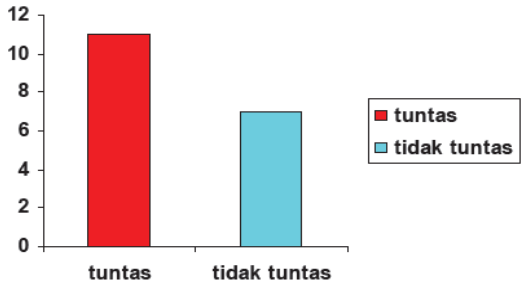


**Figure 2. Diagram of the Learning Completeness Distribution of Class IV Semester I Students of SD Negeri Pondok Kacang Timur 03 Cycle I**

Based on the table above using the experimental learning model students who have not completed (KKM ~ 70) are as many as 11 students or 31% while students who have completed 23 students or 69%.

***Cycle II***

Research analysis after using the experimental method in science learning obtained the following learning outcomes:

**Table 10. Distribution of learning completeness for Class IV students at SD Pondok Kacang Timur 03 Cycle II**

| No | Mark | Completeness | Cycle II | |
|---|---|---|---|---|
| | | | The number of students | Percentage |
| 1 | < 70 | Incomplete | 2 | 6% |
| 2 | > 70 | Complete | 32 | 94% |
| Amount | | | 34 | |
| Average value | | | 85 | |

The following is a discussion regarding the comparison of the completeness of student learning outcomes before the action, in cycle I and in cycle II shown in table 11

**Table 11. Distribution of learning completeness of Class IV SD Negeri Pondok Kacang Timur 03 Pre-Cycle, Cycle I, Cycle II**

| No | Score | Before Action Action | | Cycle I I | | Cycle II II | |
|---|---|---|---|---|---|---|---|
| | | Number of student | Percentage | Number of student | Percentage | Number of student | Percentage |
| 1 | Incomplete | 21 | 61% | 13 | 39% | 2 | 6% |
| 2 | Complete | 13 | 39% | 21 | 61% | 32 | 94% |
| Amount | | 34 | 100% | 34 | 100 | 34 | 100 |

Based on the value grouping recapitulation table in table 4.9 it can be seen that there was an increase in the number of students who completed the number of students 18 in science subjects, as evidenced for the complete classification, before the action was carried out only 13 students and 21 students had not completed after cycle I and cycle II were carried out , the number of students who completed as many as 33 students or 97%. This proves that learning using experiments in science lessons can improve student learning outcomes. At the incomplete student classification stage, before the action was held there were 11 students who had not and the number of students in class IV were 24 students, and cycle I and cycle II all students experienced 94% mastery learning, this was influenced by the existence of learning with experimental methods students were more interested , not boring because there is good communication and interaction so students will always pay attention to what the teacher teaches. This method is also effective for reducing student boredom in receiving lessons, the interactions that occur between teachers and students increase their learning motivation, especially learning science. the completeness diagram before the cycle is carried out as well as cycle I and cycle II can be seen in the picture below:

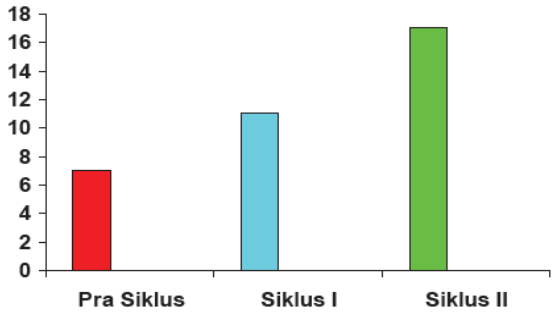


**Figure 3. Learning Completeness Distribution Diagram of Grade IV Students Semester I SD Negeri Pondok Kacang Timur 03 Pre-Cycle, Cycle I, Cycle II**

**Discussion of Research Results**

The results of observations before the action taken in class IV SD Negeri Pondok Kacang Timur 03 stated that the level of understanding of class IV students, especially science subjects, was still low, many student learning outcomes did not meet the Minimum Completeness Criteria (KKM). This is one of the reasons is because the teacher in the delivery of learning still uses the lecture method. The learning process before the action showed low learning outcomes, namely students whose grades met the KKM as many as 13 students or 37% with the highest score of 90 and the lowest score of 40. There was also an increase in the class average score. If in the pre-cycle the average value achieved was 68 then increased to 73 in cycle I, to 85 in cycle II.

There is a comparison between the number of students who have completed and not completed because 13 students who have achieved completeness have been able to grasp the material presented by the teacher even though only with lectures while 21 students have not been able to grasp material by the teacher with lectures because their comprehension power is lacking when capturing teaching material in lecture form.

To obtain learning outcomes, an assessment or evaluation is needed on students which is a follow-up or method used to measure the level of student mastery in the learning process that has been carried out (Suardipa & Primayana, 2020). So that with evaluation educators can also measure changes in student behavior significantly after the teaching and learning process is carried out in accordance with teaching objectives. So the assessment or evaluation of learning outcomes is the process of giving value to the learning outcomes achieved by students with certain criteria. Students' understanding of learning is obtained from the results of cycle I and cycle II scores

1) Cycle I

   By using the experimental learning model, there were 13 students who scored below the Minimum Completeness Criteria (KKM 70) and 21 students who got grades that met the KKM. With the highest score of 90 and the lowest score of 50.

2) Cycle II

By using the experimental approach learning model, 1 student scored below the Minimum Completeness Criteria (KKM > 70) and 26 students got grades that met the KKM. With the highest score of 100 and the lowest score of 70

Based on the results obtained in cycle I and cycle II, it was found that science learning used an experimental model on the subject of various forms of class IV objects in the first semester of SD Negeri Pondok Kacang Timur 03 which ultimately led to increased learning outcomes.

## CONCLUSION

Based on the results of the discussion of data analysis that was carried out in cycle I and cycle II in this study, it can be concluded as follows: The use of experimental methods can improve student learning outcomes in science subjects the subject of various forms of objects class IV semester I SDN Pondok Kacang Timur 03 academic year 2015/2016, this is indicated by an increase in learning outcomes, namely the learning process before the action shows low learning outcomes, namely students whose grades meet the KKM as many as 13 students or 37%, students who have not completed 21 students or 61% with the highest score of 90 and the lowest score is 40. In cycle I, the number of students who complete is 21 students or 61% while those who have not completed are 13 students or 39%. The minimum value is 50 and the maximum value is 90. In cycle II there was an increase in learning outcomes, namely the number of students' completeness was 32 students or 94%. The minimum score is 70 and the maximum value is 100. There is an increase in the average score, namely 65 in the pre-cycle to 73 in the first cycle and to 85 in the second cycle.

Thus it can be concluded that using the experimental method can improve student learning outcomes in science subjects on the subject of various material forms of class IV semester I SDN Pondok Kacang Timur 03 academic year 2015/2016 can improve learning outcomes.

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