Improving the Achievement of Natural Science Learning on Plant Reproduction using Demonstration Method on Grade VI Students at Public Elementary School 7 of Patokan in the First Semester of 2015/2016 academic year

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ABSTRACT

Natural science was concerned with finding out the nature systematically, so natural science was not only the mastery of a knowledge collection of facts, concepts or principles but also a process of discovery. Natural science learning might be conducted in scientific inquiry to cultivate the ability to think, work and be scientific and communicate it as an important aspect of life skills. The demonstration method was a way of presenting the lesson by demonstrating and showing the students of a particular process, situation or object learned in the actual form or in the form of an imitation shown by the teacher or other learning resources who was expert in the topic of discussion to be demonstrated. Meanwhile the objective of this research was: to know the improving of natural science learning result of plant reproduction using demonstration learning method on grade VI students of SDN 7 Patokan Situbondo subdistrict Situbondo regency in first semester of 2015/2016 academic year. This research used action research as much as two circles. This research target was the grade VI students of SDN 7 Patokan Situbondo subdistrict Situbondo regency in first semester of 2015/2016 academic year. Data were obtained in the form of formative test results, observation sheet of teaching and learning activities. From the analysis results were obtained that the students learning result improved from cycle I to cycle II. It was marked by the improving of students’ achievement in cycle I obtained an average score of 71.81 with 62.5% complete learning and on the second cycle improved with an average score of 74.93 with 87.5% mastery.

Key Words: Demonstration Method, Learning Result, Natural Science

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INTRODUCTION

The material related to plants reproduction is common to every individual (student) in daily activities. However, students do not realize that plants reproduction is manifold. Plants reproduction material can be understood on grade VI students, but from the results of preliminary observation almost all students of class VI in SD Negeri 7 Patokan find difficulties to understand the material of plants reproduction.

Students find difficulties to understand the material of plants reproduction because of the variety of materials. It is related to the assumption that the material of plants reproduction is difficult so that the achievement of class VI students on the material of plants reproduction is not suitable with the exception, so the writer does a series of monitoring and observation activities. The result of monitoring and observation of writer using direct dialogue with students, so the writer can find some problems which need to get attention, they are: (1). the lack of interaction between students with students and students with teacher. (2). the lack of students’ response in receiving lessons and students incline become listeners. (3). the lack of students’ facilities such as material books and supporting books, as well as props (4). The lack of competition between students to achieve better result. (5) the lack of parents’ attention, so that children learn in school only, while at home they never / seldom repeat the material obtained at school.

In improving effort of student learning result and simultaneously mastering the material of plant reproduction by students, the teaching of plant reproduction material is always linked and matched. One of efforts to improve the learning result of plant reproduction which can be implemented is by using the method of learning as an alternative becomes a solution to the problems above with implementing of demonstration learning method. Demonstration learning method is a learning method which helps and facilitates students to understand the concepts which they have previously known and the events which are observed in the classroom by performing the demonstration, with the steps: (1) the teacher conveys the competence which to be achieved (2) the teacher presents a brief overview of the material to be presented, (3) he prepares the material or tools needed, (4) he appoint one of the students to demonstrate according to the prepared scenario, (5) all students pay attention to the demonstration and analyze it, (6) each student suggests the results of his analysis and also the student’s experience is demonstrated, (7) the teacher makes the conclusion. (Budiono, 2009).

Based on the background of the problem so in this research the writer sets a title: The Improving Effort of Natural Science Learning Result of Plant Reproduction Material Using Demonstration Method on Grade VI Students of SDN 7 Patokan in First Semester of 2015/2016 Academic Year

METHODS

The implementation time of this research was conducted on August to September 2015 in first semester of 2015/2016 academic year. While the location of this research was in SD Negeri 7 Patokan Situbondo subdistrict Situbondo regency. The subject of this research was the grade VI students of SD Negeri 7 Patokan, Situbondo subdistrict, in 2015/2016 academic year with the number of 32 students. Grade VI was defined as the subject of research because based on the preliminary observation made by researcher in grade VI students who were lack in natural science learning achievement, especially in the material of plant reproduction.
The sources of research data required included: to know the result of student learning using essay test made by researcher as much as 10 questions for each cycle. To know the student activity during the learning process by using the demonstration method, used some props and observer data. The plan in this study usds two cycles. It was conducted to assess classroom behavior, interaction between students and teacher, and other observable factors, especially social skills. Its result was the total and the characteristic of the behavioral problems in the class. Observation was performed with a goal, using various techniques to record or code on what was observed. The essay test required students to organize ideas about what they learned by putting it in writing. The essay test was superior in that teachers could measure students' ability to organize their thoughts, express their opinions, and express ideas using their own words or sentences. While the limitation was a limited scope of course material, long checking time, the scoring was subjective and generally less reliable in measurement. In this test the learners were asked to do something as an indicator of the achievement of competence in the form of psychomotor ability.

Data analysis was done quantitatively by looking at the test result of each cycle, then did daily test analysis.

a. The average of cognitive score
\[ X = \frac{\text{Total of students' score}}{\text{Total of whole students}} \]

b. Determining the percentage of individual achievement
\[ Pt = \frac{\text{Total of complete learning students} \times 100\%}{\text{Total of whole students}} \]

The criteria of students’ complete learning are:

1. individual completeness, a student was said to be complete learning when he reached the score \( \geq 70 \) from a maximum score of 100.
2. classical completeness, a class was said complete if there was at least 85% reached the completeness of individual \( \geq 70 \) from a maximum score of 100.

(SDN 7 Patokan’s Curriculum, 2015)

As the main implementer of the study of plant reproduction using demonstration learning method in the classroom was a researcher who was also a teacher of grade VI. The plant reproduction learning was held in 2 cycles. The explanation of learning activity, evaluation result and reflection of each cycle were the following.

In this first cycle, it was held one time meeting with 2 x 35 minutes, in this learning activities done were:

1) The action planning phase
The steps undertaken at the planning phase of action are as follows:
(1) Conducting an observation to grade VI used as research object.
(2) Identifying obstacles and weaknesses in natural science learning process of plant reproduction done by teacher.
(3) Preparing syllabus, lesson plan, research instrument
(4) Designing a demonstration learning program.
(5) Developing constructivist learning scenario in two cycles by taking up plant reproduction material.
2) The Action Implementation Phase.
   (1) Preparing activities in formulating objectives, preparing materials, preparing outline demonstration steps, and doing demonstration exercises,
   (2) Implementation activities (opening activities: arranging seats, asking questions about previous lessons, motivating, proposing goal, core activities: doing demonstrations to attract students' attention, creating a conducive atmosphere, facilitating students to be active and critical.
   (3) Closing: asking students to summarize, giving opportunity to ask questions, conducting evaluation, following up.

3) Reflection
   Researcher and observer reflected on cycle I, which was to discuss the obstacles in the implementation of cycle I, and also did the planning in cycle II.

   In this second cycle, the learning activities done were:
   1). The action planning phase
      (1) Identifying the obstacles and weaknesses in natural science learning process of plant production in cycle I.
      (2) Preparing syllabus, lesson plan, research instrument
      (3) Designing a learning program using demonstration method.

2). The Action Implementation Phase.
   (1) Preparing activities include formulating objectives, preparing materials, preparing an outline of demonstration steps, and doing demonstration exercises,
   (2) Implementation activities (opening activities: arranging seats, asking questions about previous lessons, motivating, proposing goals, core activities: doing demonstration to attract students' attention, creating a conducive atmosphere, facilitating students to be active and critical.
   (3) Conclusion: asking students to summarize, giving opportunity to ask questions, conducting evaluation, following up).

3) The Action Observation Phase
   (1) Conducting an observation to grade VI used as research object.
   (2) Identifying obstacles and weaknesses in natural science learning process of plant reproduction by teacher/researcher.

4). Reflection
   Researcher and observer did the reflection in cycle II, which discussed the obstacles in the implementation of cycle II, and made the conclusion of learning result on learning which was implemented in cycle II.

RESULTS AND DISCUSSION

Description of the learning implementation procedure of of natural science learning result of plant reproduction using demonstration learning method on plant reproduction was held in two cycles, they were cycle I and cycle II. Each cycle included planning, execution of action, observation, and reflection of action result. The following was the description of the learning activities, evaluation results and reflection of each cycle.

Cycle I is held one time meeting with time 2 x 35 minutes, in this learning activity students and teachers conducted several demonstration activities.

The steps of learning implementation as follows:

(a) The Planning
The Lesson Plan was based on the 2013 curriculum. The lesson plan was developed by the researcher which was developed based on a syllabus in the 2013 curriculum which was begun to be implemented in the teaching and learning process of 2013, in semester 1. The learning design in cycle I was implemented within one meeting or 2 x 35 minutes on August 19, 2015.

Materials taken is plant reproduction, with sub-stems generative plant reproduction. The tools and media of learning used included: the pictures of flower parts structure. they were used for making students able to know, analyze and understand directly the learning materials which were implemented.

The standard of competence which to be achieved in this learning activity was to design and conduct experiments doing research of generative plant reproduction. The basic competence which to be achieved was to conduct experiments which showed that plant reproduction could be done by marriage/generative. To understand the material, conduct demonstrations and do the worksheets properly and correctly, students might read the material carefully and correctly before the learning-teaching process was implemented. So it needed to be emphasized on the students to learn and explore the material at home a day before.

The achievement of basic competence in lesson planning was implemented in three steps, which included: preliminary step, core activity step, and closing step. The final component of the lesson planning was to evaluate the process and evaluate the result. The process of evaluation was done by observing a student performing a demonstration in front of the class. It also observed the activities of students and researcher (teacher) during the teaching-learning process run. To find out the result of process evaluation, an observation format was made for the activities of the researcher (teacher) and students. The evaluation of result was done by observing students when expressing their opinions based on demonstration which was implemented.

The forms of tests used to determine students' understanding of plant reproduction were essay tests which were in the form of student worksheets (done individually) and performance tests. In the performance test there were several aspects which were assessed. These aspects included: students' activeness in conducting demonstrations in groups, student co-operation in group of demonstrations, and student precision in conducting demonstrations according to student worksheets.

(b) The Implementation of Action

The first cycle was held on Wednesday, August 19, 2015. The implementation of this classroom action research was done by the teacher as a researcher. The implementation of natural science learning on plant reproduction material using demonstration learning method was divided into three steps adapted to the lesson planning which was prepared. The three steps of learning included: the introduction step, the core activity step, and the closing step.

1) Introduction Step

At this stage was begun with the activities of researcher (teacher) say greetings, then he did apperception to bring the memory of students on matters relating to learning materials. He asked students, how is the generative way of plant reproduction? Who is the media in generative plant reproduction? Based
on the question and answer done, the majority of students answered the question with the answer of butterfly. After doing apperception, he conveyed the learning objectives to be achieved to the students. Furthermore, teachers divided students into four groups and distributed worksheets along with tools and media of learning to conduct a demonstration. He arranged the seats according to the letter U, to make it easier for the students to observe the demonstration, facilitate the observer to observe the teaching and learning process, and facilitate the researcher in delivering the material.

1) **Core Activity Step**

A student was given the task of coming to the front of the class and demonstrating some activities which showed that plant reproduction could be done by marriage. After the demonstration run, each group raised its opinion based on demonstration which was performed and, followed by subsequent demonstrations.

He provided an explanation or reviewed of the material as well as the matters relating to the activities which was demonstrated. By directing students to do the worksheets in groups. He assigned each group to answer the questions in the form of student worksheets.

2) **Closing Step**

After the students' worksheets were submitted, He and the students evaluated the questions which were answered by each group. It was done to determine the students’ difficulties in understanding the material. Together with students, he made conclusion about the material which was studied. He rewarded all students for their efforts in learning.

(c) **Observation**

Observation activities were conducted by observing the activities of students and researcher (teacher) during the teaching-learning process with demonstration method run. Observation was made by researcher to determine the suitability between planning and the implementation of action and the level of students' understanding of learning materials during the learning activities run. The observations made were adjusted according to the observation guidelines in the observation sheet. The aspects observed were involvement (teacher) and students from the introduction step, the core activity step to the closing step.

Based on observation made, preliminary activities was begun with the activities of researcher (teacher) say greeting, then he did apperception to bring the memory of students on all things related to learning materials. He provided motivation to students, so that they were brave to express their opinions and asked many things which were not understood based on the opinions of other students. So the students' opinions were different. He provided reinforcement by stating all opinions raised by students were correct, so it was necessary to make a statement which showed the conclusion of some students’ opinions. It was done to makes students do not get confusion at the beginning of learning, especially on manythings related to learning materials.

After doing apperception, the researcher (teacher) conveyed the learning objectives to be achieved to the students. Then, he divided the students into four groups
and distributed the worksheets along with tools and instructional media to conduct demonstration, and arrange the seats to U formation, in order to make it easier for students to observe the demonstration, facilitate the observer in observing the teaching and learning process, and the researcher in delivering material.

At the core activity step, the observer observed the activity of the researcher (teacher) who appointed a student then assigned the task of moving forward to the class and demonstrated some activities indicating the plant reproduction tools. After demonstrating each group expressed its opinion based on demonstration implemented. He provided an explanation or reviewed the material as well as many things related to the activities which was demonstrated. With the guidance of the researcher (teacher), each group answered the question in the form of student worksheet.

The closing step was begun with submitting of student worksheets. Based on the answers of each group, the researcher (teacher) and the students evaluated them. It was done to determine of students' difficulties in understanding the material. Together with students, he made the conclusion about the material studied. he rewarded all students for their efforts in learning. In giving rewards, he only gave a verbal appreciation.

Students’ involvement in teaching-learning process was also observed, which included students' precision/skill in conducting demonstration, students’ activeness in doing demonstration and expressing opinion related to demonstration done, and students’ cooperation in doing demonstration in their group to do the task and questions given by the researcher (teacher). The level of student activeness in discussion group was high, but in class discussion, the student was still less active. The intensity of student questions to researchers (teachers) was still lack.

**Reflection**

In cycle I, there was still some difficulties, among others: students were confused in designing experiments so that the teacher’s guidance was very necessary, students were not able to make conclusion about the material studied so they needed stimulation from researcher (teacher), students’ activeness was less in discussion class because students looked scared and hesitant in expressing their opinion, students were still afraid to ask questions so that the intensity of students’ questions were still lack. From the evaluation results could be seen the percentage of students' learning mastery as follows:

\[
Pt = \frac{20}{32} \times 100\% = 62.5\%
\]

It would be improved in cycle II by giving students especially in designing and performing demonstration, as well as improving the intensity in motivating students so they could eliminate the fear and hesitation which aroused in the teaching-learning process so that they were more active in learning.

Cycle II was done one time meeting about 2 x 35 minutes, in this learning activity several demonstration activities were conducted by students and teacher.

**Planning**

The Lesson plan was based on the curriculum of 2013. The lesson plan in cycle I was conducted within one meeting or 2 x 35 minutes on August, 26, 2015.
Material taken was plant reproduction, with the sub-material of vegetative reproduction on plants. The learning tools and media used included: onion, carrot, cassava, potato, sweet potato, and ginger. The learning tools and media were used so that students could know, analyze and understand directly of the learning materials which were implemented.

The basic competence to be achieved was to mention plants which reproduced vegetatively and how their reproduction was. For understanding the material, conducting demonstration, and doing the worksheets properly and correctly, students might read the material carefully and correctly before the teaching-learning process was implemented. So it needed to be emphasized on the students to learn and explore the material at home the day before.

The achievement of basic competence in lesson plan was implemented in three steps, which included: introduction step, core activity step, and closing step. The final component of the lesson plan was to evaluate the process and evaluate the result. The process of evaluation was done by observing some students performing demonstrations in the yard. It also observed the activities of students and researcher (teacher) during the teaching-learning process run. To find out the result of evaluation process, an observation format was made for the activities of the researcher (teacher) and students. Evaluation of results was done by observing students when expressing their opinions based on demonstration implemented.

The form of test used to know students' understanding of plant reproduction was essay test in the form of student worksheet (done individually) and performance tests. In the performance test there was several aspects which were assessed. These aspects included: students’ activeness in answering questions, students’ cooperation in completing tasks in the group, and students’ accuracy in answering the student worksheet.

(b) The Implementation of Action

Cycle II was held on Wednesday, August 26, 2015. The implementation of this classroom action research was done collaboratively. Researcher served as practitioner or teacher as well as observer. The implementation of natural science learning on plant reproduction material with demonstration learning method was divided into three steps adapted to the lesson plan prepared. The three steps of learning included: the introduction step, the core activity step, and the closing step. With the description as followed:

1) Introduction Step

This step was began with the activities of researcher (teacher) saying greetings, then researcher (teacher) doing apperception to bring the memory of students on manythings related to learning materials. He asked the students, what plants do vegetatively reproduce? Based on the question and answer done, the majority of students answered the question with the answer on shape of television, fan.

After doing apperception, the researcher (teacher) conveyed the learning objectives to be achieved to the students. Then he divided the students based on the group in cycle I and distributed the worksheets. The researcher (teacher) arranged the seatsto the letter U shape, to facilitate the students to observe the demonstration, the observer to observe the teaching-learning process, and the researcher in delivering the material.
2) Core Activity Step

Students were given the task of demonstrating how vegetative reproduction was done. After the demonstration, students expressed their opinions based on demonstration implemented, followed by subsequent demonstrations.

The researcher (teacher) provided an explanation or reviewed the material as well as manythings related to the activities which were demonstrated. By directing students to do the task (worksheets) in groups, the researcher (teacher) assigned tasks to each group to answer the questions in the form of student worksheet.

3) Closing Step

After the students’ worksheets were submitted, the researcher (teacher) with the students evaluated the questions answered by each group. It was done to determine the students’ difficulties in understanding the material. Together with students, researcher (teacher) made a conclusion about the material studied. The researcher (teacher) rewarded all students for their efforts in learning.

(c) Observation

Observation activities was conducted by observing the activities of students and researcher (teacher) during the teaching-learning process with demonstration methods run. The observation was held by researcher to determine the suitability between planning with the implementation of action and the level of students’ understanding of learning materials during the learning activities run. The observation was adjusted to the observation guidelines in the observation sheet. The aspects observed were the involvement of researcher (teacher) and students from the introduction step, the core activity step to the closing step. Based to observation made, introduction activities were begun with the activities of researcher (teacher) in saying greetings, then researcher (teacher) doing apperception to bring the memory of students on manythings related to learning materials. Researcher (teacher) motivated the students, so that they were brave to express their opinions and ask manythings which were not understood. The researcher (teacher) gave reinforcement by stating that the opinions expressed by the students were correct. After doing apperception, the researcher (teacher) conveyed the learning objectives to be achieved to the students. Then he divided the students into four groups and distributed the worksheet, and arranged the seats formation to the letter U shape, in order to facilitate the observer in observing the teaching-learning process, and the researcher (teacher) in delivering the material.

At the core activity step, the observer observed the activities of the researcher (teacher) which invited all students to the yard and demonstrated some activities that showed plants reproduction vegetatively. After the demonstration run, each group expressed its opinion based on demonstration implemented. After the demonstration activities finished all students, researchers (teachers) and observers go back into the classroom. The researcher (teacher) provided an explanation or reviewed of the material as well as matters relating to the activities that have been demonstrated. With the guidance of the researcher (teacher), each group answered the question in the form of students’ worksheets.

The closing step was begun with the submitting of students’ worksheets. Based on the answers of each group, the researcher (teacher) with the student evaluated the
answers. It was done to determine the students' difficulties in understanding the material. Together with students, researcher (teacher) made a conclusion about the material studied. The researcher (teacher) rewarded all students for their efforts in learning.

The students’ involvement in teaching-learning process was also observed, which included students' precision/skill in conducting demonstration, students’ activeness in doing demonstration, expressing opinion related to the implemented demonstration, and students’ cooperation of doing demonstration in their group to do the tasks and questions given by the researcher (teacher). The level of students’ activeness in discussion group was high, as well as in discussion class. The intensity of students’ question asking to researcher (teacher) was increased.

(d) Reflection
In cycle II, there were still some difficulties, they were: students were not brave to make conclusions about the material studied so that it needed stimulation from researcher (teacher), students’ activeness in discussion class began to improve although were still looked embarrassed in expressing their opinion. In cycle II, the difficulties occurred began to decrease and the student activity looked improved.

Students could do their tasks properly and correctly, although there were some weakness. Students began to look enthusiastic in expressing their opinions and answering some questions, and from the evaluation results could be seen the percentage of students' learning mastery as followed:

\[ Pt = \frac{28}{32} \times 100\% = 87.5\% \]

Data analysis was done qualitatively and quantitatively. To know the misconception of the students, the data were analyzed qualitatively and the students’ achievement was analyzed quantitatively. Students' learning result were analyzed by looking at the average and the completeness of students' learning scores found by using the following equation:

From the result of performance tests of cycle I and student answers could be seen that students' understanding on the material of plant reproduction of sub material plant reproduction generatively did not achieve the expected results. It could be seen from the average and their mastery of learning, then the data obtained as followed:

The average of students’ cognitive score:

\[ X = \frac{2298}{32} = 71.81 \]

The percentage of students’ learning completeness:

\[ Pt = \frac{20}{32} \times 100\% = 62.5\% \]

From the score data above indicated that students' learning mastery reached an average of 62.5% which was into incomplete category. Students were not able to show that the solid objects stayed in their shape through the correct activity. Individual achievement was not complete.

The result of learning was achieved in cycle II. It could be seen from the result of performance tests and students’ answers on the material of plants reproduction of sub plants reproduction vegetatively, the data obtained as followed:
The average of students’ cognitive score:
\[ \bar{X} = \frac{2398}{32} = 74.93 \]

The percentage of students’ learning completeness:
\[ Pt = \frac{28}{32} \times 100\% = 87.5\% \]

From the score data above indicated that students’ learning mastery reached 87.5% included in the category of completeness or the class was completed in studying the material of plant reproduction.

The result of this study indicated that in general the initial concept of students before the learning using demonstration learning method on grade VI of SDN 7 Patokan of plant reproduction was still in misconception. It could be seen from the evaluation result of each cycle, in the cycle I the score average was 71.81, the number of students who completed 20 students with 62.5% classical completeness in incompletely category. In cycle II the score average was increased by 74.93, the number of students who were complete were 28 students with 87.5% classical completeness including complete category. Thus, if we saw and compared the learning before and after using demonstration learning method so this learning model could improve the quality of learning outcomes, it could be seen in the following graphs;

Fig 1. The average of learning completeness in cycle 1 dan cycle 2

Fig 2. The students’ learning completeness (classical) cycle 1 dan cycle 2
The finding in this study indicated that after learning using demonstration learning method occurred the improving of students’ understanding on plant reproduction material, so that it also could increase student learning result itself. In addition, demonstration learning method helped students to understand the learning materials, because the students directly demonstrated the events surrounding of the environment that were daily done related to the learning materials. From the observer’s observation sheets could be seen that the students’ response to demonstration learning method was very good, it was seen from the students' enthusiasm during the demonstration. Students were more likely to practice directly, as it helped students to understand the events.

The use of demonstration learning method facilitated in giving of natural science learning concepts especially about plant reproduction. Although this research was generally as expected, there were some obstacles which could not be solved during the study, it was the limited tools which were available in schools, so that students were less optimal in doing the experiments.

CONCLUSION

Based on the result of the study, it could be concluded that the learning using demonstration method could improve the grade VI students’ learning result of SDN 7 Patokan Situbondo district Situbondo regency on natural science of plant reproduction material.

The learning result was suitable with the objectives to be achieved is, in the first cycle the number of students who were complete was 20 students with 62.5% classical completeness in incomplete category. In cycle II the number of students who were complete were 28 students with 87.5% classical completeness in complete category. Thus, the use of demonstration learning method could improve student learning result on natural science learning of plant reproduction material, especially on grade VI of SDN 7 Patokan Situbondo district Situbondo regency in the first semester of 2015/2016 academic year.

REFERENCES


