The Influence Of Experimental Methods Against The Process Skills Science Grade IV Elementary School Yogyakarta Golo

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Abstract

This study descriptively aims to find out the tendency of students science process skills by using experimental method and demonstration method and comparatively to find out the differences of students science process skills by using experimental method and demonstration method. The type of this study was quasi experiment. Data collection techniques used observation, test and documentation. Data analysis techniques used t-test that was started by normality test and homogeneity variant test. The results of the descriptive study showed that the tendency of the students science process skills used the experimental method were in high categories, while the demonstration method was in the medium category. Comparatively there was very significant difference of science process skills by using the experimental method and the demonstration method. The average of science process skills of the experiment method.

Keywords: ***experimental method, process skills, science***

1. Introduction

Natural sciences or science is one of the compulsory lessons in primary school, in addition to mathematics and Indonesian Language. The compulsory subjects are said to be not without reason but rather because of the graduation of the students of the primary school is determined by the value of national examination (UN) the three subjects. In contrast to learning Indonesian Language and mathematics, science learning in elementary school are demanding the students to understand and master the skills of the science process in advance so that later students easier to understand concepts that exist in learning the science. In 2013, the curriculum is mastery of the skills of the science process described in the basic skills of natural sciences from the 4th core competence (competence skills). According to Rezkita and Fitrotunisa (2016:2), science process skills can be developed in materials science in the elementary school. Competencies for grade IV includes doing observations, make written reports, create tables or graphs, perform and present the results of an experiment, make/model (Widayanti, 2016:32).

Based on the observations, the reality that is happening in SD Negeri Yogyakarta Golo indicates that the value of the results of learning the science is still below the average that is 72 while the value of the Minimum Graduation Criteria (KKM) 75. In addition more emphasis on the learning process of cognitive or knowledge domains so that lack of attention to the realm of skill i.e. process skills science students. Learning activities are dominated by the use of methods of demonstrations and faqs so undeveloped students process skills and the skills aspect of the process of assessment for students is still yet to be seen but on learning the science class IV There are two Basic Competence in aspects of knowledge and skills. More use of its dominating demonstration method in the process of learning where teachers demonstrate and explain the matter while the students listen and take note of what is explained by the teacher so that opportunities to train and develop students the science process skills are still lacking, a teacher is required to be able to cultivate the learning in the classroom, i.e. by using learning methods markedly so as not to cause saturation in students and train the skill process of science students so that the attainment of effective learning, creative, innovative and high quality.

Science learn about symptoms that occur in nature, based on the results of observation and experiments conducted by humans (Usman Sumatowa, 2009:3). Children of elementary school age are at the stage of concrete operations, meaning that the child will more easily understand the subject matter if learning activities using the media or something real in nature which will provide learning experiences that memorable for the child. The science has a characteristic as products and processes developed by scientists with the skills of the process. Learning science emphasizes on capability of student activity and skill process. Therefore it would be better if learning is conducted with associate learning materials with products and processes in real life around students.

According to Özgelen (2012:283) "Science process skills are the thinking skills that scientist use to construct knowledge in order to solve problems and formulate results." That is, science process skills are the skills of thinking that scientists used to build the knowledge to solve problems and formulating results. process skills according to Samatowa (2010:93) is the intellectual skills that are owned and used experts in researching natural phenomena. Haryono (2013:45) suggests "there is some kind of science process skills i.e. observe, classify, measure, communicate, interpret data, to predict, using tools, conduct experiments and concluded". Vali (Ramayana) and Mariyam (2013:366) argues that "Learning the I science in the primary emphasis on granting learning experiences directly through usage and skills development process".

Table 2. 1
The characteristics of the Basic Science Process Skills Activities

Process skills	Characteristics of activities
Observation	Using the senses as much as possible. Gather relevant facts and adequate.
Quantification	Observations using the measuring instrument, compare by using the appropriate gauge.
Classification	Find the difference, synchronous, looking for similarities, compare, find the basis of categorization.
Prediction	Using the pattern, linking existing patterns, predict events that will occur.
Communication	Read graphs, tables or diagrams, explain the experiment results, discuss the results of the experiment, the report systematically.
Inference	Explain the results of observation, concluded on the basis of facts/evidence from a series of observations.

Learning the science in fact involve students directly in acquiring his knowledge so that arising out of curiosity. To explore students ' curiosity, is one way that is by applying experimental learning activities. Experiments are not only able to foster a sense of curious students, but is also capable of fostering the rational and scientific way of thinking. According to Handika (2010:12) "experimental Method emphasizing a way teaching and learning involving learners with experience and prove themselves the result of a process of experimentation".

Steps of learning to use the experimental method according to Oviana and Maulidar (2013:339) is as follows:

a. preparation. Determine the formula of the goals to be achieved students after the experiment ended, the process of preparing the outlines of the experiment steps as a guide to avoid failure, and prepare your equipment as needed.

b. implementation. Guru argued what duties should be performed by the students and then invite the students to start activities, activities taking place during the process of teacher control students by observing the reactions of the whole student.

c. evaluation. After the experiment is completed need to end with the awarding of certain tasks that have to do with the execution of experiments.

In addition to the experimental method, the method is often used in the science learning in primary school (elementary school) is a method of demonstration. Nasih and Kholidah (2009:49) revealed that the demonstration was a method of presentation method of learning with a demonstrated and show to the students about a process, a specific object or situation, either actually or imitations. According to Huda (2013:233), demonstrations of effective learning methods is because learners can find out directly the application of such material in everyday life. Students can pay attention to or observe a teacher during the learning process takes place. The learning method using the demonstration would help students receive lessons with more memorable and deeply, so understanding the students well formed and perfect.

Demonstration methods have advantages and disadvantages, according to Djamarah and Zain (2010:90-91) the advantages and disadvantages of the methods experiment among others as follows.

a. the advantages of the method of Demonstration
   1) Make the teaching becomes more clear and concrete, thus avoiding verbalisme.
   2) students more easily understand what is learned.
   3) teaching Process more interesting.
   4) students are stimulated to actively observe, adjust between theory with reality.

b. Lack of demonstration Method
   1) this method requires the skills of teachers in particular, because without skill supported by implementation of the demonstration method will not be effective.
   2) facilities such as equipment, and adequate fees are not always available as well.
   3) require demonstration of preparedness and planning in addition to require a fairly long time.

The method of demonstration and experimentation is the educational interaction method is very effective in helping students menceri answers to questions such as "how the process?" (Zudafrial, 2012:60). Based on the description above, the problems raised in this research are as follows:

1. In Descriptive
   a. the extent to which the trend of the science process skills grade IV SD Negeri Yogyakarta Golo analytical study using the method of experiment?
   b. the extent to which the trend of the science process skills grade IV SD Negeri Yogyakarta Golo analytical study using the method of demonstration?
2. The Comparatively Is there any difference in the science process skills grade IV SD Negeri Yogyakarta Golo between learning using the method of experiment and demonstration method?

2. Research Method

This research is carried out in SD Negeri Yogyakarta Golo 2018/2019. The type of research used in this study, Quasi quasi experiments or alphabets experiment. The population of this research is the whole grade IV which consisted of two classes totalling 53 students. Samples are taken in a way to be drawn, with the results of class A sbagai class experiments and class B as the control class. Research instrument used is a matter of the science process skills test consists of 30 items in the form of multiple choice. From the 30-question test, having tested the validity of questions fall there are 10 reserved and 20 items. The test is given in class experiments and control. The correct answer was given a score of 1 and a wrong answer was given a score of 0. Reliability test results obtained r of 0.883. r_{table} with level 1% = 0.448. Then r > r_{table} so that the instrument can be said very high reliability criteria. Data analysis techniques are calculated using the t-test after test

3. Results and Analysis

Description of the data in this study was obtained from the data in the form of test results of process skills SCIENCE grade IV odd years lessons 2018/2019 after being given treatment that is to know the extent to which the science process skills among study using the method of experiment and method of demonstration.

After the test the maximum score = h with result ideal 20 × 1 = 20 and the ideal score of at least 20 × 0 = 0. The maximum score is based on ideal and the ideal score of at least obtained the following results :

M = (score maks. ideal + score min, ideal)
= (20+0)
= 10

SD = (score maks. ideal – score min, ideal)
= (20-0)
= 3,333

Category criteria can be composed on the correlation of a scale of five, as follows.
24, 00 ≤ x ≤ 30,00 = Very high
18,00 ≤ x < 24,00 = High
12,00 ≤ x < 18,00 = Middle
6,00 ≤ x < 12,00 = Low
00,00 ≤ x < 6,00 = Very Low

Based on the research results, the learning method using experiments obtained a score of 21.96 average when compared with the criteria on correlation of a scale of five, the group is in the interval 18,00 ≤ x < 24,00 means the tendency of the science process skills grade IV SD Negeri gantil year semester Golo Yogyakarta 2018/2019 lessons that use experimental methods are included in the categories high, whereas the results of research using the method of learning average of 19.96 acquired demonstration. When compared to the category criteria on correlation of a scale of five results calculation then this group is in the interval 18,00 ≤ x< 24,00 means the tendency of skill process of science grade IV SD Negeri Yogyakarta semester odd years Golo 2018/2019 using the method of demonstration lessons included in this category.

Test precondition analysis obtained from the distribution normality test and the test of its homogeneity variant, test prerequisites done before the test-t. From the results of calculation of distribution normality test data retrieved value the significance of data process skills science students are taught using the experimental method is 0.384 to score pre test and post test score to 0.059 and value the significance of data process skills science students are taught using the method of demonstration is 0.432 to score pre test and post test to score 0.952. Based on these results, it can be concluded that the p-value > 0.05 , so the second data above its normal.

Variant of its homogeneity test, aimed to find out whether the samples taken of the same population or not. Statistical tests used are F-test criteria if the results obtained by F_{hitung} by p > 0.05 then homogeneous Variant. As for the summary of test result data of its homogeneity Variant can be seen in the following table.

Tabel 4.2 Summary Of Test Results Of Its Homogeneity Variant

Group	N	F_{hitung}	p	Description
Experiment	27	1,228	0,273	Homogen
Control	26			

Hypothesis testing in this study were tested with test engineering-t criteria if $p \leq 0.05$ then the hypothesis is accepted. Hypothesis test results obtained from $t_{hitung} = 2.198$ with $p = 0.033$, since $p = 0.033$ then the hypothesis proposed is accepted so that it can be concluded that there is a very significant difference in the skills of the science process grade IV SD Negeri Yogyakarta Golo between learning using the method of experiment and method of demonstration.

The results of the analysis of the data that has been presented on the results of research show that there are significant differences in the science process skills grade IV SD Negeri Yogyakarta semester odd years Golo lessons 2018/2019 between learning with using the method of experiment and method of demonstration. In descriptive, the tendency of the science process skills students analytical study using the method of experiment on class IV semester odd which was followed by 27 students earn the highest score and lowest score 5, 21.96 average and a raw Byway so in this category criteria 3.402 on correlation scale is five groups of higher category. The tendency of the science process skills students analytical study using the method of demonstration on the class IV odd semester followed by 26 students, earned the highest score of 19, lowest score 3, an average of 19.96 and raw 6.063 junction so that in the category criteria on correlation scale is five groups of high category. The calculation of test hypotheses obtained t_hitung = 2.198 with p = 0.033, since p = 0.033 then the hypothesis proposed is accepted so that we can say there is a very significant difference in the skills of the science process grade IV SD Negeri Yogyakarta Golo odd semester year lessons 2018/2019 between learning using the method of experiment and method of speaking engagements.

This is in accordance with the results of research conducted by Sutasoma (2016:108) stating that the influential experimental learning methods significantly to variable results of learning and skill process of science.

4. Conclusion

Based on the data that has been collected as well as the results of analyses that have been put forward to test the hypothesis, then it can be summed up as follows:

a. Descriptive Basis.

1. Tendency of the science process skills grade IV SD Negeri Yogyakarta Golo 2018/2019 lesson that year analytical study using the method of experiment are on average with high category 21.96.
2. Tendency of process skills science grade IV SD Negeri Yogyakarta Golo 2018/2019 lesson that year analytical study using the method of demonstration is on a high with a category average of 19.96.

b. The Comparatively

There is a very significant difference in the skills of the science process grade IV SD Negeri Yogyakarta semester odd years Golo lessons 2018/2019 between learning using the method of experimentation and learning method using demonstrations, by looking at the science process skills reratanya students who are using experimental methods is higher than on the use of the method of demonstration. Based on the results of the study it can be concluded that there

is an influence of the use of the experimental method against the process skills SCIENCE grade IV SD Negeri Yogyakarta semester odd years Golo lesson 2018/2019.

5. Suggestion

Based on the results of the study, researchers gave some suggestions as follows.

1. For students
   Let always active in following activities learning and always developing the inquisitive.
2. For teachers
   Teachers should be able to choose and specify the right learning methods so that students can be more interested in learning activities. The selection of the right method will make students more interested in learning can even find his own way in mastering the material.
3. For parents
   Expected to supervise, educate, and guide on his sons and daughters in the study.
4. For schools
   The school is expected to add facilities props that support the learning process so that the process of teaching and learning can be done properly and optimally that ultimately can reach maximum learning achievements

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