

The Effect of Scientific Inquiry Learning Model and Creative Thinking Skills on Student's Science Process Skills

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Abstract : This research aimed to find out whether the science process skills of students scientific inquiry learning better than conventional learning; to find out whether the science process skills of students who have above average creative thinking skills is better than students who have below average creative thinking skills; to find out whether there was an interaction between scientific inquiry learning model with students' creative thinking skills in improving students' science process skills. This research was quasi experiment research. The population was all students of class XI-IPA Masdrasah Aliyah Swasta PTP-VI Berangir Academic Year 2016/2017. The sample selection was done by using random class technique of two classes. The first class was the class XI-IPA 1 as an experimental class taught with scientific inquiry learning model class XI-IPA 2 taught by conventional learning. The instruments consisted of a creative thinking skills test and a science process skills test with onservation. The data in this research were analyzed by using two-way ANOVA. The results showed that the science process skills of students who were taught using scientific inquiry learning model conventional learning. The student's science process skills with above average creative thinking skills shows better results than students with below average creative thinking skills. There was an interaction between scientific inquiry learning model and creative thinking skills on student's science process skills. This interaction showed the dominant student's science process skills on scientific inquiry learning model in group of students who have above average creative thinking skills.

Keywords: scientific inquiry, creative thinking skills, science process skills

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I. Introduction

Education is a fundamental need by humans, because with human education will be more able to develop his potential. Education can be regarded as a process in certain ways so that a person acquires the knowledge, understanding and appropriate behavior.

Studying physics also requires more than just learning about the products of science like skills. The culture of science involves very special actions called science process skills. The science process skills describe the actions or active doing within the culture of science that students can develop through practice and provide benefits to the classroom that extends beyond science learning. Thus, Teachers, in terms of supporting their students' science learning are challenged to achieve a balance between science concepts and process skills. Based on the results of preliminary observations being made at Madrasah Aliyah Swasta PTP-VI Berangir through interviews with some physics lecturers, found some questions in physics less less favored than physics learning. Because less interested students in physics lessons is the ongoing learning in schools still tend to use conventional learning. Conventional learning emphasizes the role of teachers. Based on the results of preliminary observations that researchers do in Madrasah Aliyah Swasta PTP-VI Berangir through interviews with some physics lecturers, found some problems in learning physics among students less like physics learners. The cause of students' lack of interest in physics lessons is that lessons that take place in schools still tend to use conventional learning. Conventional learning emphasizes the role of teachers as the main actors in the learning process. These activities make the students' lack of interest in the subject matter of physics because they tend to only listen and record the material. So the science process skill of students less formed.

In response to the above problems, it was necessary to have a learning model that oriented learning on experiment activities and discussions that can create student involvement in the learning process to foster interest and understanding of student physics concept. Students who learn by active learning methods, not only learn better, but also take more pleasure in the learning experience. One of the learning models to enable students through group learning in class and conduct discussions, exchanging opinions and questioning is a scientific inquiry learning model.

II. Literature

Scientific learning can improve the quality of physics learning on temperature and heat topics. The scientific study instruction model is more effective in improving students' science process skills with conventional learning. Another researcher (Siddiqui, 2013) argues that the learning model of Scientific Inquiry is applied to cope with high emotional, make all academics, help all grade levels, provide research techniques, develop thinking skills, Understand, apply (Anggraini and Sani, 2014). Application of scientific inquiry learning model, students are directed to improve the skills of the science process. Learning activities are conducted by exposing students to an experimental activity. Students are trained to be skilled in obtaining and processing information through thinking activities by following scientific procedures, such as, skillfully performing observations, measurements, classifications, conclusions and communicating the findings. Then the student can develop the thinking ability he has. One ability to think is the ability to think creatively.

Creative thinking skill is a skill to develop or to find original idea, idea and idea, which relate to view and concept and emphasize intuitive and rational thinking especially in using information and material to come up or explain with original perspective. Creative thinking is good in Learning will create competent students to apply ideas in detail (Tawil and Liliyasi 2014).

Science process skills was a number of specific skills in students so that students were able to process information to obtain facts, concepts, and development of concepts and values (Tawil and Liliyasi, 2014). Indicator of science process skills according to (Tawil and Liliyasi 2014), namely: a)observing, b)grouping / classification, c)interpret, d)predict, e)asking questions, f) formulating hypotheses, g)plan the study, h)using tools / materials, i)applying the concept, h)communicate.

III. Research Methodology

This research was conducted in 2017 in Semester II Class XI Madrasah Aliyah Swasta PTP VI - Berangir Lesson Year 2016/2017.

The population of this study is all students of class XI Madrasah Aliyah Swasta PTP VI - Berangir consisting of 3 classes amounting to 110 people.

The sample in this study consists of two classes selected by cluster random sampling technique, ie each class of the population is entitled to have the opportunity to be a research sample. One class as an experimental class (a class that applies scientific inquiry learning model and one class as a control class (a class that applies conventional learning).

This research is a kind of quasi experimental research, that is research that aims to know the effect of "something" which is imposed on "subject" that is student. The study involved two different sample classes treated. In experimental class with scientific inquiry instruction model while control class with conventional learning model. The research design is two groups of Pretes - Postes Design.

Table 1. Two Groups Pretest-Postest Design

Classes	Pretest	Treatment	Posttest
Experimental	T ₁	X	T ₂
Control	T ₁	Y	T ₂

Information:

X = treatment in the experimental class was the application of scientific inquiry learning model

Y = treatment in the control class was the application of conventional learning.

T₁ = pretest given to the experimental class and control class prior to treatment.

T₂ = postes given to the experimental class and control class after the treatment

IV. Results

Student's science process skills on control class and experiment class shown in Table 2 below.

Table 2. Pre-test and Post-test Significant of Student's Science Process Skills

	Science Process Skills	
	Control Class	Experiment Class
Pre-test	0.118	0.200
Post-test	0.120	0.200

Based on Table 2, the description of the significant pre-test and post-test science process skills in experiment class and control class as follows: Pre-test on control class and experiment class were 0.118 and 0.200. Post-test on control class and experiment class were 0.120 and 0.200.

3.1. Analysis of Science process skills Items on Control and Experimental Class

The implementation of the research took place 4 times each meeting in the experimental class and control class based on 4 learning implementation plan (RPP) which had been designed before the research was conducted. In the experimental class the researchers applied scientific inquiry model while in the control class the researcher applied conventional learning. The application of scientific inquiry model was intended to see whether or not the model effect was applied to the students' creative thinking and the student's science process skills in the experimental class and control class.

3.2. Data Analysis of Science process skills Based on Level of Scientific Creative Thinking Skills

The difference between average and below average because students who think high learning creativity (above average) have the ability to analyze and see before on a problem that will be done to learn more active, innovative and creative in the matter of physics.

Table 3. Two-Way ANOVA

Class	Control Class (A ₁)	Experiment Class (A ₂)	Average value
Scientific inquiry			
Above Average (B ₁)	65.69	65.69	65.69
Below Average (B ₂)	80.76	80.76	80.76
Average value	73.23	73.23	73.23

Before testing the first hypothesis tested the prerequisite is the normality test, homogeneity, and test results of normal and homogeneous data distribution. After the prerequisite test, then continued with two-way ANOVA with SPSS 17.0

Table 3 shows the value of science process skills of students who were taught by using scientific inquiry learning model and conventional learning related to student's creative thinking skills.

V. Conclusion

Student's physics process skills using better scientific inquiry learning model compared with student's science process skills using conventional learning. Physics process skill of students in scientific inquiry learning model higher than average in conventional learning.

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