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The Influence of Scientific Inquiry Learning Models on Conceptual Knowledge and Science Process Skills in Themes Always Saves Energy in Class IV SDN 101928 Rantau Panjang Labu Beach

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Abstract. **This study aims to determine: whether there is effect of scientific inquiry learning model to conceptual knowledge; whether there is effect of science inquiry learning model to science process skill; whether the conceptual knowledge of students with high science process skills is better than students with low scientific process skills. This research is a quasi experiment research. The population in this research is all students of class IV State Elementary School 101928 Rantau Panjang Pantai Labu in academic year 2018/2019 which consists of three classes. The sample is selected by cluster random sampling of two classes. The instruments used are conceptual knowledge test, science process skill test and observation sheet of learning activity. The data obtained from the research instrument then analyzed using one-way anova in SPSS 20 program. The results showed that: statistical analysis of one-way anova showed significant difference (p <0.05) between groups. The scientific inquiry learning model influences conceptual knowledge. The students conceptual knowledge is better for students with high science-process skills than students with low-process science skills.**

I. INTRODUCTION

Basically Natural Science is a method of finding out about nature systematically to master the collection of knowledge in the form of facts, concepts, principles, discovery processes and have a scientific attitudes. This of course has implications for learning activities in natural science. Natural science and the study of natural science are not just scientific knowledge, but contain the content of natural science, process skills and dimensions focused on the characteristics of scientific attitudes and character [1]. Learning natural science is a process and product produced through teaching and learning activities that are principled on learning by doing.

Natural science as a product is a collection of the results of empirical and analytical activities carried out by scientists in the form of facts, concepts, principles, and theories that can explain and understand nature and the various phenomena in it. Natural science as a process in this case is the process of acquiring natural science through scientific methods. Natural science as a process is a number of skills to study natural phenomena as a process of science in acquiring science knowledge, including the ability of observation, classification, quantification, inference, communication, interpretation, prediction, hypothesis, controlling variables, planning and carrying out research [2].

In this case, the teacher must be able to encourage students to gain experience by conducting activities that allow them to find concepts and principles for themselves. In other words, learning occurs when students are actively involved in using their mental processes so that they gain experience, allowing them to find some of these concepts or principles. learning must shift from "being told" to "actively finding out". Learners must be encouraged as "inventors and owners" of knowledge, not just users or memorizers of knowledge. In learning natural sciences, students build knowledge for themselves. For students, the knowledge in their minds is dynamic, develops from simple to complex, from the scope of its own and around it to a wider scope, and from the concrete to the abstract. Therefore, optimal scientific process skills are needed to support the success of natural science.

Based on the results of observations made in grade IV elementary school 101928 RantauPanjangLabu Beach, it was found that as many as 60% of students had low conceptual knowledge. This is characterized by the weak ability of students in classifications and categories, principles, and generalizations, as well as theories, models and structures in learning natural sciences. So that the skills of students' sians in learning natural sciences are low. When answering questions students cannot explain why and how the results were obtained. Students of grade IV elementary school 101928 RantauPanjangPantaiLabu are not yet used to practicing or experimenting which involves the process of learning by doing. Therefore, the ability of students to draw conclusions and interpretations cannot be said to be good. Students also have not been able to make scientific reports from the natural science material studied. The ability of students to hypothesize is also lacking. as many as 65% of students experience misconceptions in learning natural science. This happens because the teacher in teaching only uses conventional learning models. The teacher has never used a scientific research based learning model. So that many students experience misconceptions in learning.

Science process skills are very important in the learning process of natural science. Science process skills are very important. science as a process includes the skills and attitudes that scientists have to achieve scientific products. If science contains products and processes, then in teaching students not only to deliver science products, but the teacher must train students about scientific activities involving various basic skills contained in aspects of science process skills.

The learning process that can develop the ability of science process skills based on the conceptual knowledge possessed by using the model of scientific inquiry learning. As the 2013 curriculum uses a scientific approach to learning. Learning using a scientific approach means that learning is done scientifically. The scientific approach is one of the scientific approaches. Unlike other scientific approaches that prioritize an inductive approach that looks at general phenomena then draws specific conclusions. The scientific approach combines two approaches, namely inductive and deductive approaches in contracting concepts, principles etc. In addition the scientific approach involves science process skills and cognitive abilities in contracting concepts / principles etc.

Scientific methods generally place unique phenomena with specific studies to formulate general conclusions [3]. The scientific method refers to investigative techniques for a phenomenon or phenomenon, obtaining new knowledge, or correcting and integrating prior knowledge. To be called scientific, the method of inquiry must be based on evidence from observable, empirical, and measurable objects with specific principles of reasoning. Therefore, the scientific method generally contains a series of data collection activities through observation or experiment, processing information or data, analyzing, then formulating, and testing hypotheses [4].

The scientific inquiry method is carried out based on a scientific approach. Where is the inquiry learning model which in practice the teacher provides guidance or instructions quite clearly to students based on the scientific method. Learning using a scientific approach with inquiry models can improve the three domains of learning outcomes in a balanced manner. This shows that the scientific approach as a scientific method will be very suitable to be taught with the inquiry learning model.

Learning natural science is in desperate need of conceptual knowledge. Conceptual knowledge includes schemes, mental models, or explicit and implicit theories in different cognitive psychology models. The constituent knowledge of students will form good sians process skills if taught using the scientific inquiry learning model [5]. The science process skills of students who are taught with the scientific inquiry model are better than students taught with conventional learning, physics science process skills students who have above average scientific argumentation are better than students who have below-average scientific arguments, and there is a scientific inquiry model interaction with students 'scientific arguments in improving students' science process skills [6]. In this case, students must be able to develop their cognitive dimensions such as remembering, understanding, applying, analyzing, evaluating, and being creative in learning natural sciences.Conceptual knowledge is very important to avoid misconceptions in learning natural sciences and science process skills students also develop. This is because students must have the correct concept of learning about natural science material as a basis for initial research. Increasing students 'concept knowledge can be seen through students' science process skills. Physics learning really requires science process skills to increase students' knowledge. The aim of the study was to determine the relationship of science process skills to the mastery of students' physics concepts. [7]. This research method uses literature review from previous research using descriptive analysis based on variable regression values. The results of the study show that science process skills affect the mastery of students' physics concepts. This is influenced by each indicator of science process skills that are able to develop and improve cognitive, psychomotor, and affective aspects of students.

Learning models based on scientific research or scientific inquiry are very important in learning natural science. The use of the scientific inquiry learning model aims to build the real concept of natural science. If students' conceptual knowledge has been built, then the science process skills of students will also develop. So this study will examine the influence of the scientific inquiry learning model and conceptual knowledge on science process skills on alternative energy materials in grade IV elementary school 101928 RantauPanjangLabu Beach. Science process skills are very important in learning natural science. As the principle of learning natural science is learning by doing, the process of learning is far more important than the product obtained. The formulation of the problem examined in this study is 1) the influence of the scientific inquiry learning model on science process skills on the theme always saves energy in class IV public elementary school 101928 RantauPanjangLabu Beach; 2) the effect of the scientific inquiry learning model on conceptual knowledge on the theme always saves energy in class IV public elementary school 101928 RantauPanjangLabu Beach; 3) the influence between conceptual knowledge of science process skills taught by the scientific inquiry learning model on the theme always saves energy in class IV elementary school Negeri 101928 RantauPanjangLabu Beach.

II. THEORETICAL REVIEW

A. Conceptual Knowledge

Knowledge is the result of human sensing, or the result of one's knowing the object through its senses (eyes, nose, ears, etc.) [8]. By itself, at the time of sensing to produce knowledge is very much influenced by the intensity of attention and perception of the object. Most of a person's knowledge is obtained through the senses of hearing (ears), and the senses of sight (eyes). A person's knowledge of an object contains two aspects, namely positive and negative aspects. Both of these aspects will determine one's attitude the more positive aspects and objects that are known, it will lead to an increasingly positive attitude towards certain objects [9].

Conceptual knowledge includes knowledge of categories, classifications, and relationships between two or more categories or classifications of knowledge that are more complex and organized. Conceptual knowledge is one aspect of what is called disciplinary knowledge, namely the way scientists think of a phenomenon in their scientific discipline. Conceptual knowledge consists of three sub-types, namely knowledge of classification and categories, knowledge of principles and generalizations, and knowledge of theories, models and structures [10].

There are three types of conceptual knowledge, such as knowledge of classifications and categories, knowledge of principles and generalizations, and knowledge of theory, models and structures.

a. Knowledge of classifications and categories includes knowledge of categories, classes, sections, or structures that apply in a particular field of science.
b. Knowledge of principles and generalizations: includes abstraction of observation results to a higher level, namely the principle or generalization. Principles and generalizations are abstractions of a number of facts, events, and interrelations between a number of facts. Principles and generalizations usually tend to be difficult for students to understand if students have not fully mastered phenomena which are "observed" forms of a principle or generalization.
c. Knowledge of theory, model, and structure: includes knowledge of the principles and generalizations and interrelationships between the two that produce clarity on a complex phenomenon. Knowledge of theories, models and structures is a very abstract and complicated type of knowledge.

B. Science Process Skills

The learning process should follow the active secar students to develop the skills of student progress, among others observe, interpret, predict, applying the concept, classifying, planning, using tools, and conduct research and communicate findings [11]. According to process skills are physical and mental skills related to the basic abilities possessed, mastered and applied in a scientific activity so that scientists succeed in discovering something new [12]. Skills whole process is directed scientific skills (both cognitive and psychomotor) that can be used to find a concept or principle or theory, to develop a concept that has been there before, or to perform a denial of the invention or clasification [13]. Process skills become two levels, namely basic level process skills (basic science process skills) and integrated process skills (integrated science skills). Basic level process skills include: observation, classification, communication, measurement, prediction, and inference. While the skills of an integrated process includes determining variables, tabulated data, preparing charts, giving the relationship variables, process the data, analyze the investigation, draw up hypotheses, determine the operational variables, the investigation plan and conduct experiments. Indicators of science process skills is to observe, classify / classify, interpret / interpretation, forecasting / prediction, communication, ask questions, propose hypotheses, planning experiments / investigations, using the tools / materials / resources, applying concepts, conducting experiments / investigations [11]

Learning involves three processes that take place almost simultaneously. The three processes (1) obtain new information; (2) information transformation; (3) testing the relevance and determination of knowledge [14]. In addition, science process skills are also in accordance with the constructivism theory, explaining that one's knowledge is formed by the person himself. The process of knowledge formation occurs when someone changes or develops a scheme that has been owned in dealing with challenges, with stimuli or problems. Piaget's theory is often called personal constructivism because it places more emphasis on one's personal activity in constructing his knowledge. What's more because Piaget did a lot of research on a child's process in learning and building his knowledge.

C. Inquiry Scientific Learning Model

The learning model has: 1) syntax (learning phase); 2) social system; 3) the principle of reaction; 4) support system; 5) impact. syntax is a stage in implementing a model in learning activities [15]. Syntax shows what activities need to be done by the teacher and students from the beginning of learning to the final activity. The social system describes the roles and relationships between teachers and students in learning activities. The principle of reaction is information for the teacher to respond and appreciate what is done by students. The support system describes the support conditions needed to implement the learning model. While the instructional impact is a direct impact resulting from the material and skills based on the activities carried out. The inquiry learning model is also called the scientific research model. The inquiry process is the process of investigating a problem. Inquiry is done by seeking truth or knowledge that requires critical, creative, and intuition thinking. The role of the teacher in inquiry learning is as a motivator and facilitator in guiding students in carrying out efforts to obtain answers or problems that are formulated or proposed.

The essence of the model of scientific research (scientific inquiry model) is to involve students in research problems are completely original in a way exposes them to the field of investigation, helping them identify problems conceptual or methodological in these fields, and invite them to devise ways to solve the problem [16] Scientific research has academic discipline on how knowledge is produced and obtained. In this case, students present the area of inquiry, students arrange problems, students identify problems in the investigation, and students speculate on ways to solve difficulties.

There are 4 stages of the scientific inquiry learning model, namely:

a. Syntax
   Syntax has phases but is not rigidly ordered. In phase one, the field of inquiry is directed to students, including the methodologies used in the investigation. in phase two, the

problem is suspended so that students identify a difficulty in the investigation. Difficulties may be one of the data interpretations, experimental controls, or conclusions. In phase three, students are asked to speculate about problems, so students can identify the difficulties involved in the research. In phase four, students are then asked to think of ways to solve difficulties by redesigning experiments, compiling data in different ways, generating data, developing constructs, and so on.

b. Social syntax
In this case, a cooperative and careful climate is needed. The climate, including certain levels of courage and simplicity. Students need to hypothesize carefully, challenge evidence, criticize research designs, and so on.

c. Reaction principles
The teacher's task is to nurture research by emphasizing the research process and influencing students to reflect on it. Teachers need to be careful so that the identification of facts is not a central issue and instead encourages a good level of accuracy in research

d. Support system
Lessons can be presented in the distance learning process, but easy access to an instructor is important. Mixed structures with strong teaching in school are the best possibilities.

III. RESEARCH METHODS

This type of research is quasi-experimental (Quasi Experiment). Quasi Experiment has a control group, but cannot fully function to control external variables that affect the execution of experiments [17]. In this study there was one treatment that was given, namely the scientific intelligence learning model. In general, this study aims to compare the learning outcomes of science process skills using scientific inquiry learning models and conceptual knowledge. The design used is Quasi Experiment calculated using one-way ANOVA analysis.

This research was conducted in class IV SDN 101928 RantauPanjangLabu Beach in the even semester of 2018/2019 school year. The population in this study were all students of SDN 101928 RantauPanjangPantaiLabu in the 2018/2019 school year and the sample was the fourth grade students, which consisted of three classes namely class IV-A, class IV-B, and IV-C with the number of students each class (Class IV-A numbered 32 people consisting of men = 21 people and women = 11 people, while Class IV-B numbered 32 people consisting of men = 14 people and women = 18 people) and Class IV-C numbered 29 people consisting of men = 12 people and women = 18 people). The sampling technique in this study was conducted by purposive sampling of three sample classes.

Data collection instruments aim to obtain research data that is adjusted to the research variables. The instruments in this study are tests of conceptual knowledge and science process skills. The conceptual analysis test was tested on students who were not a sample in the study. This test trial aims to obtain valid and reliable tests. The analysis prerequisite test aims to capture data that meets or does not meet the requirements for analysis. Testing the prerequisites for data analysis using the calculation of normality test and homogeneity test.

IV. RESEARCH RESULT

The data of this study are quantitative data obtained from fourth grade students of public elementary schools 101928 Rantau Length Labu Beach which amounted to 93 people consisting of three classes namely class IV A (experiment I) totaling 32 students, class IV B (Experiment II) which numbered 32 students, and class IV C (control class) totaling 29 students. Data were obtained from the tests of each group after being treated. The treatment in question is learning by using inquiry scientific learning model on science process skills (experiment I), learning using scientific inquiry learning model on conceptual knowledge (experiment II), and conventional learning in the control class. The study was conducted for six meetings. The results of descriptive analysis of the research can be seen in table 1.

TABLE I. Results of Calculation of Research Descriptive Analysis

Class	**Average**	**Variable Class**	**Standart Deviasi**	**X max**	**X min**
ExperimentI	14,59	3,65	1,91	95	55
Experiment II	14,40	3,86	1,96	90	50
Control	12,14	3,74	1,93	75	40

Based on the table above it is known that the highest average grade score is obtained by the class that uses the inquiry scintific learning model on science process skills that is equal to (14.59), and the lowest is in the control class (12,14).Research requirements test are normality and homogeneity test. The normality test aims to see whether the sample data is normally distributed or not. The test used the Liliefors test with an alpha level $\alpha = 0.05$. A summary of the normality test can be seen in table 2.

TABLE 2. Data Normality Test Results

Class	**Lmax**	**Ltable**	**Information**
Experiment I	0,141	0,161	Normal
Experiment II	0,105	0,161	Normal
Control	0,089	0,161	Normal

Based on Table 2, it can be seen that Ltabel is greater than Lmaks, so the sample data is normally distributed. Homogeneity test is performed to find out whether each group class has the same test score variance or not. Homogeneity test

in all three classes using the Barlett test. Homogeneity test results can be seen in table 3.

TABLE 3. Homogeneity Test Results

Class	**F count**	**F table**	**Information**
The three groups	0,035	5,99	Homogen

Based on Table 3, that Fcount is greater than Ftable, which means that the variance is homogeneous. Hypothesis testing is done by one-way Anova test (One way - anova). Based on the results of calculations in the three classes using the One Way Anova test (One way - anova) obtained F count 13.76 and Ftable 3.10 at the 0.05 level. A summary of the results of the One-way Anova test analysis can be seen in table 4

TABLE 4. Summary of One Way Anova Test

Variant Source	**Number of squares**	**Degree of freedom**	**Average square**	**F count**	**F table**
Inter group	104,6	2	52,3	13,76	3,10
In group	292,4	77	3,80		
Total	397	79	56,5	13,76	3,10

Based on Table 4, it can be concluded that the scientific inquiry learning model influences conceptual knowledge. Students' conceptual knowledge is better for students who have high science process skills than students who have low science process skills.

This research was conducted in three classes, there were two experimental classes and one control class. The experimental class I uses the scientific inqury learning model in the scientific process skills. The experimental class II uses the inquiry intelligence learning model to conceptual knowledge. Control class uses conventional models. the results of the calculation of the average experimental class I were higher than the experimental class II and the control class. Students who have high process skills have high conceptual knowledge compared to students who have low process skills.

V. Conclusion

Based on the description of the results of the study and the discussion in this study, there are several things that can be used as conclusions, including the following. First, there is the influence of inquiry scientific learning models on science process skills. Second, there is the influence of scientific inquiry learning model on conceptual knowledge. Third, students who have high process skills have high conceptual knowledge compared to students who have low process skills.

VI. SUGGESTION

This research is very well applied in the 2013 curriculum. The use of scientific inquiry learning models provides good benefits for improving student science process skills and conceptual knowledge.

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