



The Influence of Active Learning on the Concept of Mastery of Sains Learning by Fifth Grade Students at Primary School

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Abstract: The research aims to know the effect of Active Learning on the concept of mastery of sains learning by fifth grade students at primary school. The method that is used in this research is a quasi-experimental research. The aspect being measured in this research was comparing two learning groups. Experiment group was exposed to Active Learning Model and control group to conventional learning model. The data population of this research was all fifth grade students (28 students) at Primary School Soropaten 2 district Klaten in academic year of 2017/2018. The population was then divided into two classes. 14 students were in the experiment class, and 14 students were in the control class. The data sampling of research conducted with cluster random sampling. Data collection techniques included tests and observations. Data analysis was done by using a t-test and descriptive statistics. The results showed that learning with Active Learning Model influences the concept mastery of sains learning. The result learning by fifth-grade students Primary School showed 2.990 with the significance level at less than 0.05 i.e., 0.006.

Keywords: *Active Learning, fifth grade at primary school, sains learning.*

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Introduction

Basic education is carried out to develop skills and attitudes and provide basic knowledge and skills that are used as capital to live in a society. Basic education is a place to prepare the students to attend secondary education. Education in primary schools in Indonesia is carried out for 6 years starting from the ages of 6 to 11 years. As stated by Mowseian (2010) that elementary schools usually serve children between the ages of five to eleven years, or kindergarten through sixth grade. Some elementary schools comprise kindergarten through fourth grade and are called primary schools. These schools are usually followed by a middle school, which includes fifth through eighth grades. Elementary schools can also range from kindergarten to eighth grade". At this age, the students have various skills, disciplines and behaviors as well as getting to know the surrounding environment.

In the implementation of learning in elementary schools, learning must emphasize the modern pedagogical dimension and prioritize personal experience through the scientific process. Daryanto (2014) suggests that the scientific learning process is designed so that students actively construct concepts, laws and principles. The stages of the scientific process are observing, formulating problems, proposing or formulating hypotheses, collecting data, analyzing data, drawing conclusions, and ending by communicating the concepts that have been found. Based on this, learning must be linked to the environment and the lives of students on a daily basis. Students must interact directly with what they learn in order to understand the material. Interacting directly can provide a good learning experience for students. In addition, students can also explore information in depth. As revealed by Samatowa (2011) that direct experience provides an important role as a driving force for children's cognitive development, and learning models suitable for Indonesian children are learning through direct experience.

The age of elementary school children is an important development stage to support the success of further development. Cognitive development of elementary school students is still in the concrete operation stage. Students' thinking activities at the concrete operational stage are carried out through real experiences. These experiences come from the process of interaction with the object being studied. Students at the concrete operational stage cannot yet think abstractly. Sains learning is one of the subjects in elementary school. In essence, science is about nature and the

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environment around students. Trianto (2014) states that science is a systematic set of theories, its application is generally limited to natural phenomena, born and developed through scientific methods such as observation and experimentation and demands scientific attitudes such as curiosity, openness, honesty and so on. Sains subjects teach ways to be scientific, namely by providing scientific problems and demanding students to solve problems using scientific methods as well. Therefore, sains learning must involve students to be active in solving scientific problems. Based on this, it is necessary to have an atmosphere of learning that is in accordance with the stage of thinking of students. If learning is not in accordance with the stage of thinking of students, learning becomes meaningless. Based on this, the learning process must require students to be actively involved in learning.

The fact that occurs in the field is that sains learning only emphasizes the cognitive aspects of students using the lecture method. Based on the results of observations and interviews conducted at Primary School Soropaten 2 and Primary School Brangkal 2 in July 2017, researchers found several findings namely; first, sains teaching materials only have one handbook for teachers, so the references are very limited; second, students do not have a handbook on natural science subjects; third, the content of the material in the sains learning book is not complete as is the material about style, and there is a material that is asked at the time of the exam but there is no book; fourth, the book is not up to date, not in accordance with the current state of government; fifth, the value of students is low in mastering concepts in sains subjects; sixth, students are passive in learning activities because learning is still conventional. On the other hand, Wuryani (2018) said that "the textbook being developed is used as media for teachers and students to create a fun learning and provides opportunities for students to be independently active learners".

Trianto (2014) said that the essence of sains learning is science that studies symptoms through a series of processes known as scientific processes that are built on the basis of scientific attitudes, and the results are manifested as scientific products composed of the three most important components in the form of concepts, principles and theories that apply universally. Sains learning is a method of finding out about nature systematically to master knowledge, facts, concepts, principles, discovery processes and have a scientific attitude. Sains learning in elementary schools is beneficial for students to learn about themselves and the natural environment. Therefore, sains learning is one of the most important subjects, and there is a need to deal with existing problems. If the problem is not immediately resolved, it can be ascertained that student learning outcomes are also less than optimal.

One way that can be taken is to develop sains learning based on active learning. Zaini et al (2008) states active learning is very necessary for students to get maximum learning outcomes. When students are passive or only receiving from teachers, there is a tendency to quickly forget what has been given. In the teaching and learning process, it will be easier to be understood and be remembered longer by students when students are actively involved in learning mentally, physically and socially. Silberman (2009) argues that when lessons are boring, often only with active learning methods that are fun, and it can satisfy students and motivate them to master it, even though the material is boring.

Warsono and Hariyanto (2013) said that the results of research from the National Training Laboratories in Bethel, Maine 1954, the United States showed that in teacher-centered learning groups ranging from lectures, reading assignments, teacher presentations with audio visuals and even with demonstrations by teachers, students can only remember learning material up to 30%. In learning with discussion methods that are not dominated by teachers (not class discussions, whole class discussions, and teachers as discussion leaders), students can remember as much as 50%. If the students are given the opportunity to do something (doing something), they can remember 75%. The practice of learning by teaching leads them to be able to remember as much as 90% of the material.

It can be said that the active learning method is one of the most effective methods used in learning activities. The active learning approach in learning activities will be more effective if it is adjusted to the learning conditions and the ability of the teacher in carrying out this approach. With the application of this approach in learning, students are expected to be able to develop their abilities and be able to find relationships between material that is learned in real life to solve problems that exist in everyday life. Things like this are small examples that the teacher must really pay attention to so that the delivery of material can correspond to real life conditions, and students can be active in learning. From the results of this thought, the researchers intended to develop sains learning for fifth grade elementary schools that can encourage students to be able to form active learning habits. It is expected that if students' needs are met, it will influence and facilitate students in learning and achieving their learning goals. Based on the description, the researchers intend to conduct research with the title of "The Influence of Active Learning on the Concept of Mastery of Sains Learning by Fifth Grade Students at Primary School".

Methodology

Research Goal

The purpose of this research is to know the effect of using Active Learning Model on the concept mastery of sains learning by fifth grade students at primary school. The aim of this research is to show the outcome of active learning on sains learning at the fifth grade students in primary school. The aims of this research as specially was described: (1) to know the enhancement learning outcomes in sains learning when the students use Active Learning Model, (2) to

describe the application and implementation of Active Learning Model on sains learning at the fifth grade students in primary school, and (3) to compare learning between Active Learning Model and conventional learning model.

Sample and Data Collection

The method that was used in this research was a quasi-experimental research. The sample of research conducted with cluster random sampling. The data sampling of this research was the fifth grade students (28 students) at Primary School Soropaten 2 district Klaten in academic year of 2017/2018. The population was then divided into two classes, resulting in 14 students in the experimental class and 14 students in the control class. Data collection techniques were tests and observations. The used tests were pre-test and post-test. Data analysis was done by using a t-test and descriptive statistics. The t-test was conducted using a prerequisite test. The prerequisite of the test was normality and homogeneity tests.

Analyzing of Data

Data analysis was done using SPSS 21.0 Statistical Package Program. Analysis of variance and t-test were carried out to determine the differences in variable scores. In this test, score 0.05 was used as significance level. If the t_{obs} showed less than 0.05, it was accepted. If the t_{obs} showed more than 0.05, it was rejected. Independent Sample T-test was used to count data.

Findings / Results

The results of students' concept of mastery of sains learning through the provision of pretest and post-test with 15 items of multiple-choice questions were as follows:

Table 1. The Data Scores of Students' Concept Mastery (Scale 0 – 100)

Numb. Students	Experiment Class		Numb. Students	Control Class	
	Pretest	Post Test		Pretest	Post Test
1	27	60	1	53	67
2	40	73	2	27	53
3	53	87	3	53	67
4	40	73	4	33	60
5	53	87	5	73	87
6	60	93	6	33	60
7	53	87	7	60	80
8	53	80	8	33	60
9	60	93	9	53	67
10	53	87	10	60	73
11	73	100	11	53	73
12	40	73	12	73	87
13	67	93	13	40	60
14	40	73	14	73	87
Average	50.86	82.78	Average	51.21	70.07

Based on table 1 above, the average pretest score of students in the experimental class was 50.86, and the average post test score (after receiving treatment of Active Learning Model) was 82.78. Meanwhile, the average pretest score of students in the control class was 51.21, and the average post test score with the use of conventional learning model was 70.07.

Before performing the hypotheses test, the data of students' concept of mastery of sains learning that have been obtained were firstly tested to know the data normality and homogeneity. Based on normality tests, significant level of experiment class that had received treatment of Active Learning Model was 0.065, and significant level of control class was 0.200. Between experiment and control classes it had reached significant level of > 0.05 . It could be considered that the distribution value of the students' concept of mastery by using the Active Learning Model and the conventional learning model was normally distributed. The results of homogeneity tests in sains learning at the mean significant level was $0.06 > 0.05$. So, the data which came from population had homogeneous variance.

Discussion and Conclusion

Based on the data above, it can be said that the experimental class was treated with Active Learning had a higher level of concept mastery when compared to conventional learning models. Active Learning Model had a positive influence on the mastery of the concept of sains learning by fifth graders in Primary School Soropaten 2. In the line with the results of this study, a study conducted by Daouk et al (2017) which stated that "Active learning techniques enable students to shed their traditional role as passive receptors, learn, and use new skills meaningfully ". This is in the line with the opinion of Patton (2015) stating that "Much empirical evidence suggests that student outcomes improve with a more

active learning approach, where the educator takes on the role of facilitator, taking into consideration students learning style, attention span and specific needs." This was reinforced by research conducted by Comacho and Legare (2015) stating that "Active learning techniques encourage students to reflect on the materials, analysis, process, and prepare to discuss all strategies confirmed to improve higher order thinking skills". The use of Active Learning Model can create meaningful learning experiences so as to increase students' knowledge and understanding in learning. In addition, the Active learning Model is useful for recognizing students' limitations and knowing the needs of students in learning. Active learning Models emphasize not only mental activity but also physical activity in the learning experience. This is reinforced by the opinion of Nelson and Crow (2014) explaining that "Active learning does not necessarily imply mental activity, students can be physically active and / or verbally active in a learning experience ...". In addition, research conducted by Cattaneo (2017) which states that, "... practice may find this discussion on active learning pedagogies, not only in comparing and concurrent pedagogies but also in recognizing their limitations to meet students' needs". Furthermore, research conducted by Patton (2015) states that "Much empirical evidence suggests that student outcomes improve with a more active learning approach, where the educator takes on a role of facilitator, taking into consideration students learning style, attention span and specific needs".

Active learning is a teaching method that invites students to actively participate both mentally and physically in the learning process in order to be able to change their behavior effectively and efficiently. Students are said to be active in learning if: (1) students do something to understand the material; (2) students learn and discover knowledge; (3) students try concepts to solve problems; (4) carry out group discussions according to the teacher's instructions; (5) asking other students or teachers if they do not understand the problem at hand; (6) students communicate the results of their thoughts with the teacher or other students. The results of this study indicate that all active learning indicators have been fulfilled. The scores of students on experiment class proved to be higher than control class. The activeness of students in the experimental class also proved to be better and fostered greater learning motivation. This is in accordance with the results of research conducted by Wilke (2003) stating that "active learning is viewed as a way of improving student learning in sains." Correspondingly, the results of the study by Aklinoglu (2007) state that "the application of problem-based Active Learning Model affects students' conceptual development positively and keep their misconceptions at the lowest level". The results of Prince's (2004) study show that "Active Learning concludes that students have better attitudes and improvements in students' thinking and writing". The results of Comacho's study (2015) say that "Incorporating active learning strategies into the classroom produces a more effective learning environment and increased student participation and engagement".

Based on the results of research and hypotheses testing, it can be concluded that the Active Learning Model influences the mastery of the concept of sains learning by fifth grade students at primary school Soropaten 2 in the 2017/2018 academic year. Based on the results of testing hypotheses using the Independent Sample tests, it was evident that the Active Learning Model influences the mastery of the concept of sains learning students with a significance level result of $0.006 < 0.05$. Thus, it can be considered that concept mastery of experiment class is higher than control class.

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