

The Effectiveness of Model Learning Preser-X Assisted LKS Against Science Process Skills and Understanding Students Concept

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Abstract

This study aims to know the effectiveness of worksheet-assisted Preser-X model to science process skills and concept understanding in third grade of primary student on energy material. The research was conducted in Elementary School of Bategede 01 Nalumsari Jepara academic year 2016/2017. The method was Quasi Eksperimental Design. The sample was taken by using saturated sampling. The data were collected such as science process skills with observation and worksheet instrument, and concept understanding with test instrument. The data were analyzed by using one sample t-test for achievement tested for science process skills, proportion test for achievement of classical mastery, independent t test for difference test, simple linear regression for influence test, and N-gain for improvement test. The result showed average score of science process skills was 77% categorized skilled. Classical mastery of concept understanding was obtained 93,10%. There was difference between concept understanding between experimental class and control class and there was influence of science process skills and concept understanding. The improvement in concept understanding in medium category with the percentage 58,62% . The study concluded that the application of worksheet-assisted preser-X models more effective against science process skills and concept understanding of primary students.

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INTRODUCTION

The natural science consists of scientific processes, scientific products, as well as scientific attitudes. Science as a scientific process defined all scientific activities to perfect knowledge of nature as well as to discover new knowledge (Trianto, 2012). The scientific process in science learning conducted in seeking knowledge and scientific truth through investigation is called the science process skill. Through the skills of the science process, it will produce scientific products in the form of knowledge and understanding of concepts, principles and theories of science supported by scientific attitude.

Understanding the concepts and skills of the science process in schools can be effective if applying the appropriate learning model. The learning model should be inspirational, interesting, fun, challenging, motivating students to participate actively, and providing sufficient space for student initiative, creativity and independence in accordance with Government Regulation Number 19 of 2005 on National Education Standards Chapter IV Standards Process 19.

But in reality, science lessons in schools have not been as expected. Teachers rarely apply attractive learning models and enable students. Teachers still teach the learning model that is centered on the teacher, as expressed by some teachers of 3rd grade in Jepara, which sometimes implement cooperative learning model Think Pair share but in teaching teachers often use the lecture method, and students just to exchange opinions with friends. Cooperative learning causes students to understand only the concept by exchanging opinions in groups only without any evidence, less curiosity, and less motivate students in following science lessons.

The low curiosity and motivation of learning also have an impact on student learning outcomes. The results of science study in elementary school are shown from the results of the 2016/2017 academic year semester grade grade in grade 3 of SDN Bategede 01 Jepara, 14 of 29 students reach KKM in grade 3A, and 16 of 29 students reach KKM in grade 3B.

The learning outcomes of the natural science are measured by understanding the concept and skills of the process. Understanding concepts includes the cognitive aspects of students in understanding or understanding something after being known and remembered. The students 'understanding of the concept of natural science is still low because learning is only a rote memory of a number of concepts and rarely the skills of students' science processes. Low process skills are demonstrated by infrequent student activities such as observing, classifying, predicting, planning experiments, experimenting, obtaining results, and communicating in science lessons.

Based on the above problems, there is one model of learning that facilitates students to improve students' understanding of the concept and science process skills through practical methods predict the model of learning is observed explain abbreviated preser X. Anisa (2013) states that the models predict observe your learning based approach to explain the process has benefits for beginning students explore ideas to make predictions, generate discussion among students, motivate and arouse the curiosity of students to investigate the concept has not been understood. This is in accordance Liew (2004) states that the stages of the learning model consists of predicting a phenomenon (predict), they observed the demonstration (observe), and describes the results of the demonstration and their previous forecasts (explain).

Application of learning models preser-X is optimal if aided by the use of student worksheet as a medium that contains an activity sheet that was developed with syntax-syntax learning model preser-X main predict, observe your, explain about the teaching material Energy and its amendment in class 3SD. Based on the results of research from Utami (2014) mentioned that the worksheet made by the teacher is more effective to form thinking habits in students.

Based on the foregoing, the purpose of this study are as follows: (1) analyze the achievement of science process skills of students apply learning model preser-X-aided worksheet; (2) analyze the

students' understanding of the concept of the learning model application preser-X-aided worksheet achieve classical completeness; (3) analyze the significant difference in students' science process skills in applying the learning model preser-X-assisted worksheet and implementing models of think pair share; (4) analyzing the influence of science process skills on conceptual understanding; (5) analyze the significant improvement in the understanding of the concept that students apply learning model preser-X-aided worksheet.

METHODS

The design of this study using research methods quasi experimental design quantitative with non equivalent control group design similar to the pretest-posttest control group design. The study was conducted in two classes given different treatment, the experimental class applying the learning model preser-X aided worksheet and control classes that implement learning model Think Pair share. The research procedure consists of the initial observation stage, the research planning stage, the implementation stage, and the data analysis phase.

The population of this study is all students of class III SDN Bategede 01 Nalumsari Jepara with sampling technique that is purposive sampling with the number of 58 students. There are two classes of III that are sampled, ie class IIIA as experimental class and class IIIB as control class.

The research variables consist of independent variable, dependent variable, and control variable. The independent variable of the model preser-X and Think Pair share model. The dependent variable in this research is science process skill and concept comprehension.

Control variables in this study are subject matter and teacher. Data collection technique

used in this research is observation technique with instrument in the form of observation skill of science process and worksheet and test technique with instrument in the form of concept comprehension test.

The data analysis technique consists of the semester replicates data analysis, data analysis instruments, and analysis model preser-X-aided worksheet against science process skills and understanding of the concept. The analysis of the recovered semester data is used to determine the normal distributed samples. Analysis of instrument data in the form of learning device validation and grain analysis about concept comprehension with validity test, reliability test, difficulty level, and distinguishing power to get valid problem. Analysis of the effectiveness of the learning model preser-X-aided worksheet against science process skills and understanding of the concept of using one-sample t-test to analyze the achievement of science process skills, test proportion to analyze the classical completeness, independent t-test to analyze differences in understanding of concepts, test the simple linear regression to analyze the influence, and the N-gain test to analyze the improvement of understanding of the concept.

RESULTS AND DISCUSSION

Level of Science Process Skills

Science process skill score in grade IIIA elementary students at SDN Bategede 01 was obtained from students' activities during science learning. Learning to apply the learning model preser-X aided worksheet by practical methods. Data on students' science process skill is obtained through student activity observation and student worksheet answer. The results of the science process skills obtained based on the observation sheet are presented in Figure 1.

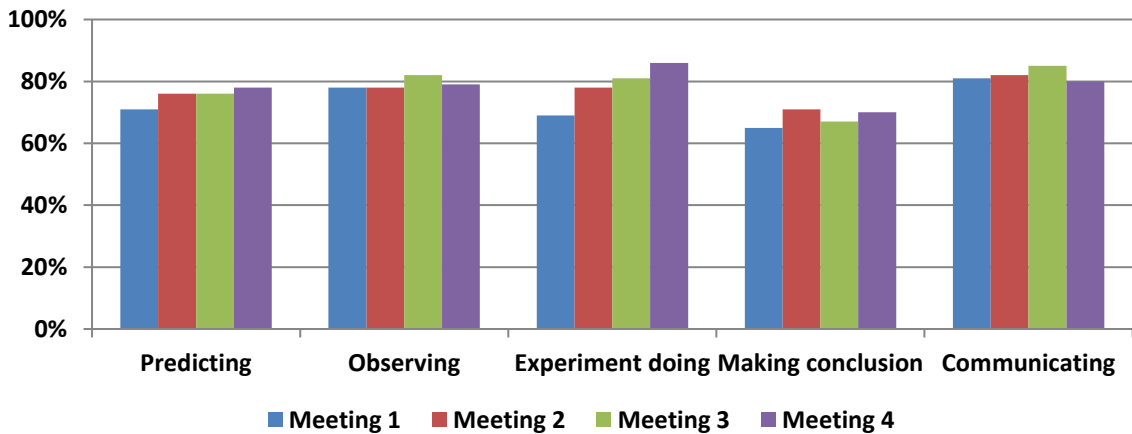


Figure 1. Diagram of The Acquisition of Science Process Skills Based on The Observation Sheet

Based on Figure 1 at the 1st to 4th meeting, the percentage of average results of the aspects of the science process skills was found, there were 3 aspects that experienced an increase of predicting aspects and experimental aspects. While aspects of observing, making conclusions, and communicating aspects have increased and penururan. Terdapat 1 aspect of science process skills including the category of skilled enough, namely to make a conclusion. While 4 other aspects including skilled categories.

Score of science process skills is also calculated using the answers in the worksheet. However, the aspect of the science process skills assessed consists only of three aspects, namely predicting, making conclusions and communicating. The result of science process skill score based on worksheet can be seen in Figure 2.

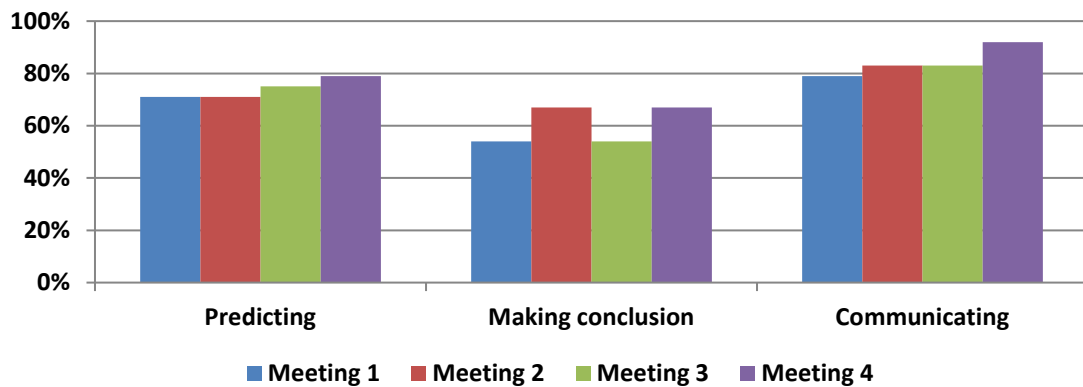


Figure 2. Diagram of The Acquisition of Science Process Skills Based on LKS

Based on Figure 2 the aspect predicts an increase from the 2nd meeting to the 4th meeting with an average percentage of 74 skilled categories. The communicating aspect increased from the 1st meeting to the 4th meeting with an average percentage of 84 skilled categories. However, the aspect of making a conclusion gets the lowest score per meeting with

an average percentage of 61 categories skilled enough. Of the four meetings, the scores of science process skills obtained were lowest at the 1st meeting with an average percentage of 68% skilled categories.

Level of Concept Understanding

Understanding student concepts is calculated from the value before and after the research. Control class students and experimental classes before being given treatment in the form of learning models are given a test in advance to measure students' understanding of the subject matter of Energy and its changes. After being

given treatment, students' conceptual understanding is also measured using the same test questions as before. The results of the calculation of the value of concept understanding before and after the research on the control class and experimental class can be seen in Table 1.

Table 1. Understanding Concepts Before and After Research in the Control Class and Experiment Class

Data	Control class		Change	Experiment class		Change
	Pretest	Posttest		Pretest	Posttest	
Lowest value	52.38	57.14	4.76	47.62	61.90	14.28
The highest score	85.71	95.24	9.53	95.48	100.00	4.52
Average	70.27	78.81	8.54	72.08	83.74	11.66
Median	71.00	78.51	7.51	71.00	85.00	14
Mode	61.90	80.95	19.05	66.67	85.71	19.04

The Effectiveness of Worksheet-Assisted Preser-X Model to Science Process Skills and Concept Understanding

This study aimed to test the effectiveness of the model preser-X-aided worksheet against science process skills and understanding of the concept. Based on the results of research in the value of science process skills and the value of concept comprehension test, then there are 5 analysis studies of the problem formulated. The analysis results are described as follows.

1. Achievement of Student Science Process Skills

Science process skills of students apply model preser X aided worksheet calculated using one-sample t test. One sample t test / t test one sample is a way to test for differences in the average sample value / specific constants. Tests carried out with SPSS 16 and using a 5% error level. Analysis of achievement of science process

skills with SPSS 16 to get the average value of 77.03 and sig count of 0.136. Sig count value $0.136 > \text{sig value } 0.05$ means that the average science process skills are not equal to 75%, but more than 75% is 77.03%.

2. Student Classical Completeness

Student's classical completeness is calculated from the students' understanding of the concept before and after the research on the experimental class and control class. Before determining classical completeness, it is calculated beforehand the completeness of individual control and experiment class. The minimum completeness criteria of science subjects in SDN Bategede 01 Kecamatan Nalumsari Jepara is 70. The difference of the students' comprehension data on the control class and the experimental class is presented in Figure 3.

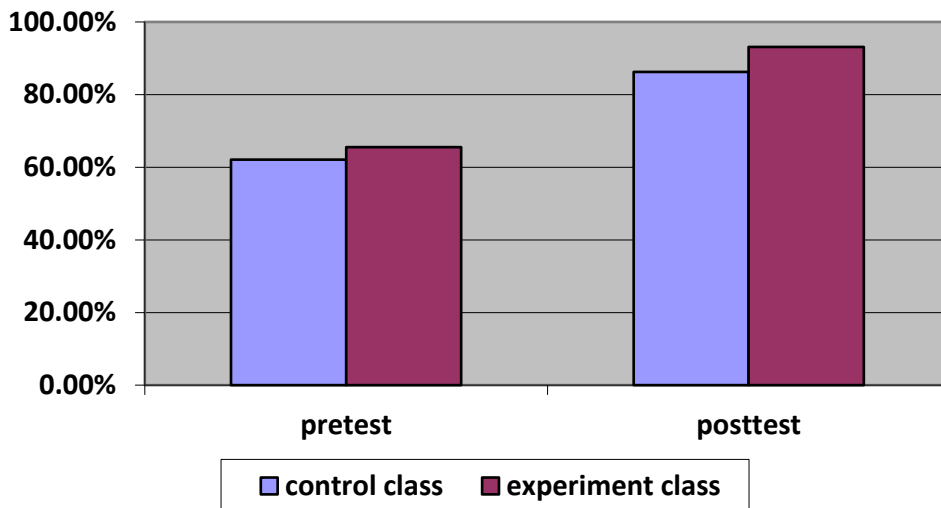


Figure 3. Classical Chart of Classical Control Class and Experiment Class

Figure 3 shows that complete students in the Science of Energy materials and its Change in control classes experienced an increase of 24.14%. While the students who complete the learning of science and energy materials in the experimental class had an increase of 27.59%. Understanding the concept of students who achieve classical completeness after applying the learning model preser-X-aided worksheet calculated using the proportion test. The results of the test analysis of the proportion of conceptual understanding are presented in Table 2.

Table 2. Results Average Scientific Process Skills in Experiment Class

	Control class	Experiment class
The value of Z arithmetic	0.25	1.28
The value of Z table	1.64	1.64
Conclusion	Students who achieve KKM > 85%	Students who achieve KKM > 85%

Based on the analysis in Table 2 in the control class Z values obtained 0.25 > Z value of 1.64 means H_1 received so that the proportion of students who reach KKM control class > 85% of the 29 students. In the experimental group obtained the value Z 1.28 > Z value of 0.05 means H_1 received so that the proportion of students achieving KKM experimental class > 85% of the 29 students.

3. Differences Understanding Concepts Between Students Control Class and Experiment Class

Understanding the difference between applying the concept of learning model preser-X aided worksheet by applying a model Think Pair Share is calculated using independent t test / test t two samples uncorrelated. Independent t test is a way to test the difference in the average of two samples / data obtained from two different groups. The data used was the result posttest control class and experimental class.

Based on the test results of independent t test with SPSS 16 is obtained that sig count 0.073 > 0.05 sig so that there are differences in understanding of the concept of students apply learning with model preser-X and share learning model Think Pair. These results are relevant to the research of Sastrika (2013) that the project-based nature of science learning model has an influence on student learning outcomes and critical thinking skills. There is a difference in understanding the concept and critical thinking skills between students who follow project-based learning and students who follow conventional learning.

4. The Influence between Science Process Skills to Concept Understanding

The influence of science process skills on conceptual understanding can be tested by using simple linear regression analysis. Simple linear regression analysis is a way to know the effect of one independent variable with one dependent variable. Based on analysis of the influence of science process skills to the understanding of the concept of earned value calculated sig $0.728 > 0.05$ sig then H_1 is accepted that there is significant influence between science process skills to the understanding of the concept by the regression equation $Y = 81.150 + 0,049x$. This result is relevant to the research of Markawi (2014), that the students 'science process skills

have an effect on the students' concept comprehension at 6.25%.

5. Improved Concept Understanding

Improved understanding of the concept of students in the experimental class using learning model preser-x-aided worksheet and control classes using think pair share models were analyzed by using the formula N-Gain. The gain is the difference between the post-test and pre-test, the results showed an increased understanding of the concept gain students after using model preser-x-aided worksheet. The N-gain results for improved concept comprehension on control classes and experimental classes are presented in Table 3.

Table 3. Results Improvement of Student Class Concept Improvement

Score	Criteria	Control Class		Experiment Class	
		Amount	%	Amount	%
$N\text{-gain} \geq 0.70$	High	2	6.89	4	13.79
$0.30 \leq N\text{-gain} < 0.70$	Medium	14	48.27	17	58.62
$N\text{-gain} < 0.30$	Low	13	44.82	8	27.58

Based on Table 3 it can be concluded that the improvement of understanding the concept of experimental class at the most on the criteria is with the percentage of 58.62%. While improving the understanding of the concept in the control class on the criteria of low and medium. Results improved understanding of this concept is relevant to the study of Hilario (2015) which indicates that the strategy is observed-explain predict more effective in improving student achievement in science subjects.

CONCLUSION

Based on the results of research and discussion, obtained conclusions about the effectiveness of the learning model preser-X-aided worksheet against science process skills and understanding of the concept of students.

Achievement of science process skills of students apply learning model preser-X-aided worksheet of 77.03% with a skilled categories. Understanding the concept of

students with learning model application preser-X-aided worksheet reached 93.10% classical completeness. There are significant differences in students' understanding of the concept of applying the learning model preser-X-assisted worksheet and implementing models of think pair share. This is evidenced by the value of sig arithmetic test results independent t test 0.073. There is a significant influence between the science process skills on conceptual understanding with the sig value of the simple linear regression test of 0.728.

Improved understanding of the concept of significant on students who apply learning model preser-X-aided worksheet higher than the increase in understanding of concepts in students applying thin pair share model. This is evidenced in the experimental class of concept comprehension improvement at most on the criterion is 58,62% while 58,27% in the control class of concept comprehension increase most at medium criterion equal to 48,27%. Fifth Based on the above description, it was concluded that

the model preser X aided worksheet more effective against science process skills and understanding of the concept of the student rather than the learning model Think Pair share.

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