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INFLUENCE MODEL GENERATIVE LEARNING PROCESS THE IMPROVEMENT OF SCIENCE AND SKILLS LEARNING OUTCOMES GRADE X SMA NEGERI 1 KUALA

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Abstract- In learning science, especially physics, students are expected to have the skills and able to apply in everyday life. The application can not be fulfilled if the basic capabilities have not yet formed. Basic capability is referred to as process capability is the ability of a general nature and is oriented to a higher science, and can be applied to a wider job. A particular skills in learning science, can be obtained learners by providing a range of experiences to students and guide them to use scientific knowledge, so as to study science learners are expected to have the skills to think and act in the knowledge of science has. The purpose of this study was to determine (1) the effect of the application of models of generative learning to improving the science process skills of students grade X SMA Negeri 1 Kuala and (2) the effect of the application of models of generative learning to improving the learning outcomes of students of class X SMA Negeri 1 Kuala. This research is a quasi-experimental design with *non-equivalent control group design*. The population in this study were all students of grade X SMA Negeri 1 Kuala districts of Bireuen district Juang City academic year 2015/2016. The sample in this study consisted of two classes of students of class X/3 and X/5 SMA Negeri 1 Kuala selected by *purposive sampling*. The results showed that (1) there are significant generative learning model to the improvement of science process skills class X SMA Negeri 1 Kuala namely, generati learning model can improve science process skills class X on the material expansion. (2) there are significant generative learning model towards improving student learning outcomes Class X SMA Negeri 1 Kuala, namely generati learning model can improve the results of class X student at the material expansion.

***Keywords*:** generative learning model, science process skills, learning outcomes and swelling.

1. INTRODUCTION

Learning physics oriented only memorizing formulas and concepts will not provide significant meaning for students, but learning physics learners expected to make the move like a scientist to build the concept and apply the concepts acquired. Learners should be trained to experiment and think to analyze data from experiments [22]. In learning science, especially physics, students are expected to have the skills and able to apply in everyday life. The application can not be fulfilled if the basic capabilities have not yet formed. Basic capability is referred to as process capability is the ability of a general nature and is oriented to a higher science, and can be applied to a wider job.

A particular skills in learning science, can be obtained learners by providing a range of experiences to students and guide them to use scientific knowledge, so as to study science learners are expected to have the skills to think and act in the knowledge of science has. These skills are known to science process skills [2]. [9] there are a variety of process skills these skills consist of basic science process skills (basic skills), starting from observing , classifying , predicting , measuring and communicating concluded.

Based on interviews with teachers of physics in SMA Negeri 1 Kuala known that for three consecutive semesters value end of the semester students still lower that under the KKM set of school at 70, almost every semester the teacher must provide remedial to meet the KKM participants learners. Habits learners in learning was just reading and memorizing during replay. Consequently students did not master the material and less skilled in applying science concepts. Of course, impact on science process skills as basic skills are not inherent and growing in self-learners.

In research on students' mastery of PPP in Indonesia, it was concluded that the acquisition of KPS is still low in [37]. From this research, nearly 50% of students have a low level of mastery KPS/low.

Likewise, in some countries in Asia, was the level of mastery of PPP both in primary school students and secondary is still low [37]. From these studies, researchers concluded that required the development of learning model that enables teachers and students in the classroom PPP float together.

One solution that can assist learners in an effort to train science process skills of students is to apply the generative learning model. Generative learning model according to Osborne and Wittrock [12] is a model of learning in which participants learn to actively participate in the learning process and in constructing meaning from information that is around based on prior knowledge and experience possessed by the study participants. Emphasis generative learning later stated by Suyanto in [12] that emphasizes generative active integration of the new material with the schemata on the minds of students, so that students say with their own words what they have heard.

Research Sutarman and Swasono [36] concluded that the strategy of generative learning can (1) increase the activity of the learner role in the learning process of physics on the subject of electrical energy and magnetism in Junior High School 17 Malang and (2) application of models of generative may increase physical process skills of learners. [38] also conducted research by applying the learning model generated the creative thinking skills and science process skills of learners on these results (1) there is a difference of KBK and KPS between learners participating in learning activities with learning model generative with learners follow learning activities with direct instructional model, (2) there is a difference of KBK between learners participating in learning activities with learning model generative with learners participating in learning activities with learning model and (3) there are differences in the PPP between learners participating in learning activities with learning model generative with learners participating in learning activities with direct instructional model.

2. METHODS

The method used in this study is a quasi-experimental research (*quasi experiment*) research design *Non-equivalent Control Group Design.*

Table 1. Non-equivalent Pretes-Postest Control Group Design

O1	X	O2
O3		O4

Information:
O 1 and O3: Pretest experimental and control groups
O 2 and O4: Posttest experimental and control groups
X : Treatment with generative learning model the experimental class

The population in this study were all students of grade X SMA Negeri 1 Kuala districts of Bireuen district Juang City Academic Year 2015/2016. The sample in this study consisted of two classes of students of class X/3 and X/5 SMA Negeri 1 Kuala selected by *purposive sampling*. This study uses tests as instruments of good research to measure the learning outcomes of students and also students' science process skills. Each question amounted to 15 questions.

3. RESULTS AND DISCUSSION

3.1 Student Learning Outcomes

Assessment of learning outcomes for the material expansion of the control class and experimental class conducted in a different way. In the control class applied experimental methods are applied while the experimental class generative learning model. In this study the learning outcome in the material expansion seen from the acquisition value of pretest and posttest were already given.

Overview increase in the average learning outcomes of students between classes and grade control experiments can be seen in the Figure below:

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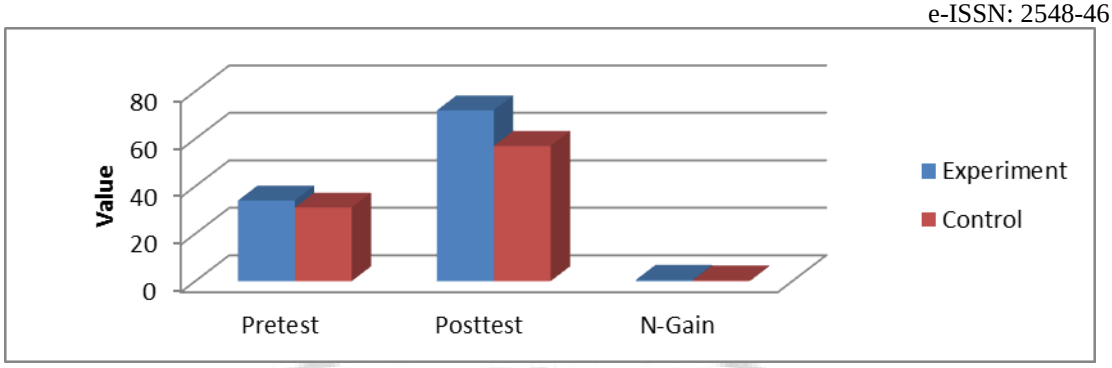

Figure 1. Comparison Values Control Class and Class Experiment

Based on the above image obtained by the percentage of learners n-gain experimental class and a control class that is 57% and 41%. Although both are in the moderate category but the value of n-gain experimental class is higher than the n-gain control class.

In a test of normality and homogeneity to determine what the data from samples taken normal distribution and having variances homogeneous or not. Output of test for normality by Shapiro-Wilk test was obtained Sig. for classes kontrols 0,06 and for the experimental class 0,125 so sig . > 0,05 then H_o accepted, both the data is normally distributed.

Furthermore, the homogeneity test test output based *Test Laeve* obtained Sig. = 0,214 so> 0,05 then H_o is accepted and both homogeneous data. From the statistical data contained in the study and also from testing hypotheses that have been carried out by researchers using a statistical formula, then the final value based on the *output of t-test for Equality of Means* obtained Sig. <0,05 namely 0,040 so that it can be concluded H_o is rejected and H_a accepted or it can be said that the learning outcomes of students with *generative* learning model is not the same as learning outcomes of students with an experimental model.

Emphasis is put forward by Suyatno generative learning in [12] that emphasizes generative active integration of the new material with the schemata on the minds of students, so that students say with their own words what they have heard. Research Sutarman and Swasono [36] concluded that the strategy of generative learning can (1) increase the activity of the learner role in the learning process of physics on the subject of electrical energy and magnetism in Junior High School 17 Malang and (2) application of models of generative may increase physical process skills of learners. [38] also conducted research by applying the learning model generated the creative thinking skills and science process skills of learners on these results (1) there is a difference of KBK and KPS between learners participating in learning activities with learning model generative with learners follow learning activities with direct instructional model, (2) there is a difference of KBK between learners participating in learning activities with learning model generative with learners participating in learning activities with learning model and (3) there are differences in the PPP between learners participating in learning activities with learning model generative with learners participating in learning activities with direct instructional model.

3.2 Science Process Skills Students

Rate science process skills of students for the material expansion of the control class and experimental class conducted in a different way. In the control class applied experimental methods are applied while the experimental class generative learning model. In this study, an increase in science process skills of students in the material expansion seen from the acquisition value of pretest and posttest were already given. Overview increase in the average learning outcomes of students between classes and grade control experiments can be seen in the Figure below:

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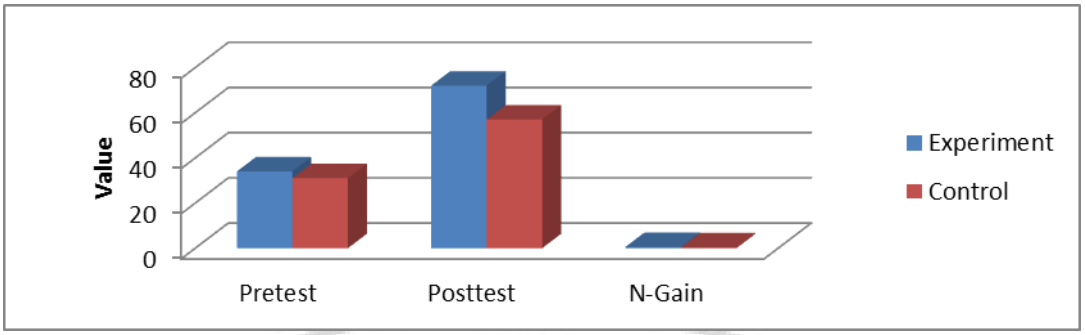

Figure 2. Comparison Values Control Class and Class Experiment

Based on the above image obtained by the percentage of learners N-gain experimental class and a control class that is 36% and 57%. Although both are in the moderate category but the value of N-gain experimental class is higher than the N-gain control class.

In a test of normality and homogeneity to determine what the data from samples taken normal distribution and having variances homogeneous or not. Output of test for normality by Shapiro-Wilk test was obtained Sig. for the control class to class 0,276 and 0,095 experiments so sig. > 0,05 then H_o accepted, both the data is normally distributed.

Furthermore, the homogeneity test test output based *Test Laeve* obtained Sig. = 0,782 so> 0,05 then H_o is accepted and both homogeneous data. From the statistical data contained in the study and also from testing hypotheses that have been carried out by researchers using a statistical formula, then the final value based on the *output of t-test for Equality of Means* obtained Sig. <0,05 namely 0,000 so that it can be concluded H_o is rejected and H_a accepted or it can be said that the science process skills of students with generative learning model is not the same as science process skills learners with an experimental model.

In this study using 4 indicators for science process skills are skills to observe, plan experiments, hypothesize and apply subconcepts. As for the improvement of science process skills of students per class indicator KPS both in control and in the experimental class is as follows:

Table 2. Science Process Skills Improvement Indicators

Indicators KPS	N-Gain Classroom Control	Category	N-Gain Class Experiments	Category
Observer	0,44	Moderate	0,72	High
Plan Your Experiment	0,47	Moderate	0,79	High
Hypothesize	0,33	Moderate	0,59	Moderate
Applying Subconcepts	0,31	Moderate	0,42	Moderate

According to the table above shows that in the classroom learning model experiment control with the average n-gain are in the category of being good at observing indicator, planned experiment, hypothesize and apply subconcepts. While the experimental class with the generative learning model on the indicators obtained n-gain observed at 0,72 which is the category of the high and the indicators obtained n-gain planning a gain of 0,79 is at the high category. As for the indicator hypothesize and implement sub concepts that are in the moderate category. Thus seemingly that increase students' science process skills by applying the generative learning model is better than learning model experiments. It is seen from the PPP there are two indicators increased to the high category.

Generative learning model consists of four stages: exploration, focusing, challenges and applications [36]. In this stage of focusing learners are required to work a laboratory to test the hypothesis in its own way these activities are done by the lab. In the practicum students to practice more on laboratory skills practicing all components of the process of science is starting to observe (observation), measure, control variables, classify, create graphics, inferring, predicting and communicating [25].

Thus, in that has been done by applying the generative learning model in the material expansion in SMA Negeri 1 Kuala it can be concluded that the generative learning model has been able to improve science process skills and learning outcomes of students in the material expansion.

4 CONCLUSIONS

Based on the discussions that have been described, it can be concluded that: (1) there is the influence of generative learning model to the improvement of science process skills class X SMA Negeri 1 Kuala namely, generati learning model can improve science process skills class X on the material expansion; and (2) there is the influence of generative learning model towards improving student learning outcomes class X SMA Negeri 1 Kuala, namely generati learning model can improve the results of class X student at the material expansion.

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