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The Effect of Scientific Inquiry Learning Model for Student's Science Process Skill and Self Efficacy in The Static Fluid Subject

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***Abstract* - This study aimed to know the effects of Scientific inquiry learning model to students' Science Process skill and Self Efficacy in the static fluid subject. This study used a quasi experiment with two group pretest posttest design. The population of this study was all the students grade XI in Senior High School Al - Azhar Medan, North Sumatera academic 2017/2018. The sample selection by cluster random sampling namely XI Science- C grade as experiment class implemented scientific inquiry learning model and XI Science-B grade as control class implemented conventional learning. The instruments of the research were valid essay test of science process skill and questionnaire of self - efficacy. From result of study was students' science process skill taught by Scientific Inquiry Learning better than conventional learning. Students'Science Process skill have self - efficacy high better than students' conventional learning.**

Keywords - Scientific Inquiry Learning Model; Science Process skill; self - efficacy,

I. INTRODUCTION

The process of building physics in students can begin with do some activity that is observing, asking questions, making a hypothesis, predict, find patterns and relationships, communicate, to design and create, plan and conduct investigations as well as measuring and counting. These activities are part of the science process skills (KPS). KPS serves as competence for effective learning in science and technology, problem solving, individual and social development (Omema, 2016). KPS stressed on formation of skills to acquire knowledge and communicating then to familiarize students become a physicist can be expressed that students need to be equipped KPS.

Based on the results of the interviews of researchers with some random students in High School School of Al-Azhar, note that they rarely do practical work in the laboratory, but in the schools there is the laboratory. This be against KPS students who did not develop because rarely do practical work, and less trained do KPS. This was confirmed when students do practical work, students look confused in following the steps in the student worksheet given teacher. Students are less able to observe phenomena that occur when practical, less able to communicate with a group of friends, less serious, was not able to make a correct conclusion and tend to ask any teacher will do the experiment. In the meantime if the students used to doing practical work, thus KPS students could increase as students become accustomed to observe, ask questions, create a hypothesis, predict, find patterns and relationships, communicate, to design and create, plan and investigations as well as measuring and counting. Such activity is an indicator of the KPS students.

KPS students who did not develop terhadapa also has the students confidence. This statement is supported by Ceylan (2016) *self-efficacy* related to KPS students, *self-efficacy* of students who initially low began to increase because in the formation of heterogeneous groups with *self-efficacy* of students that high. *Self-efficacy* according to Bandura (Kathleen: 2016) is the consideration of a person about himself to achieve levels of performance (performasi) to the desired or specified as well as affect the action. Responding to the above problem is need for model involving active learning students to enhance student learning outcomes and KPS, that one is a learning model of *scientific inquiry*. Based on the above description, the author interested in research with the title: " The Influence Of Model Learning *Scientific Inquiry* Science Process Skills and Against *Self-Efficacy* Students on the material Fluid Static ".

II. METHOD

This research was a quasi experimental research with two group pretest-posttest design. The population of this research was second semester of class XI academic year 2017/2018 at Senior High School Al - Azhar Medan,North Sumatera,Indonesia. The sample of this research were two

classes that consisted of 125 student's by using class random sampling technique. Class XI Science-C was experimental class taught by scientific inquiry model, class XI Science-B was control class taught by conventional learning. Variables of this research consisted of independent and dependent variable. The independent variable was scientific inquiry learning model, and the dependent variable was science process skill and self - efficacy. The treatment instruments were lesson plan, handout, and student workbook. Measurement instruments consisted of valid essay test of science process skill and questionnaire of self self - efficacy that fulfilled validity and reliability requirements. The material was essay test of fluid static for second semester of class XI. The data were analyzed by using prerequisite and hypothesis test. The normality test were analyzed by Kolmogorov-Smirnov Test. The homogeneity test were analyzed by Levene's Test of equality error variance. Hypothesis test were analyzed by using *independent sample t-test* with the level of significance 0.05.

III. RESULT

Student's science process skill on the control class and experiment class shown in Table 1.

TABLE 1 . Pretest and Posttest data of students ' science process skill

Class	**Average Student science process skill**	
	Pretest	Postest
Experiment	33.92	75.52
Control	30.56	57.28

Based on Table 1, a description of the mean values of science process skill of pretest and posttest students in the control class and experiment class is the U.S. follows: pretest in control class 30.56 and experiment class 33.92. Posttest control class 57.28 and experiment class 75.52.

Student's self-efficacy on the control class and experiment class shown in Table 1.

TABLE 2 . Pretest and Posttest data of students ' science process skill

Class	**Average Student self-efficacy**	
	Pretest	Postest
Experiment	55.28	78.64
Control	56.88	66.28

Based on Table 2, a description of the mean values of self-efficacy of pretest and posttest students in the control class and experiment class is the U.S. follows: pretest in control class 56.88 and experiment class 55.28. Posttest control class 66.28 and experiment class 78.64.

TABLE 3. Hypothesis Test Data Science Process Skills Postes Class experimentation and Control Classes

		The t-test for the hypothesis						
		T	**Non-degree**	**SIG (2-way)**	**The difference in average**	**The difference in standard deviation**	**95% confidence level**	
							Bottom	**Top**
The Value Of The Postes	The assumption of equal variance	7.877	48	0.000	18.240	2.316	13.584	22.896
	Assuming a variance is not the same	7.877	47.824	0.000	18.240	2.316	13.584	22.896

Based on Table 3, significant value (sig 2-way) is 0.000, on the conditions to see the influence that is used t test (sig 1-direction) is significant obtained was significant from ½ 2-way i.e. 0.000, because the value of smaller significance from 0.05 then Science process skills or accepted students class experiments better than science process skills grade control.

TABLE 4. Hypothesis Test Data Postes *Self-Efficac* Experiment Class and Grade Control

		The t-test for the hypothesis						
		t	**Non-degree**	**SIG (2-way)**	**The difference in average**	**The difference in standard deviation**	**95% confidence level**	
							Bottom	**Top**
The Value Of The Postes	The assumption of equal variance	14,974	48	0.000	12,360	0,825	10,700	14,020
	Assuming a variance is not the same	14,974	46,945	0.000	12,360	0,825	10,699	14,021

Based on Table 4, significant value (sig 2-way) is 0.000, on the conditions to see the influence that is used t test (sig 1-direction) is significant obtained was significant

from ½ 2-way i.e. 0.000, because the value of smaller significance from 0.05 then received or *self-efficacy* of students class experiments better than the *self-efficacy* of students of the class of the control.

IV. DISCUSSION

A. The Influence Of The Learning Models Of Scientific Inquiry To Science Process Skills Of Students

Based on the research that has been done, the learning model applied in the classroom experiment is *scientific inquiry*. Models of *scientific inquiry* is never applied in the process of learning physics in high school so that make Al-Azhar students confusion against the learning model of *scientific inquiry*. Therefore, the researcher first describes the learning model of *scientific inquiry* to the students before the study began. Of each meeting has done there is the influence of model *scientific inquiry* against an increase in the activity of the science process skills. Improved that greatly influences the process of science skills students can be seen on phase the third of *scientific inquiry* that is identified in the investigation phase. In this phase, students are more actively find ways – ways to overcome the problem, design an experiment again, manipulate data properly and developed the idea of the experiment. It can also be seen in Table 4.9 shows the value of the science process skills postest students increased from an average of pretest 33.92 to an average of 75.52 posttest. Results from such postest shows insufficient values because there are still some students who are not actively doing practical work, and do not like learning physics.

B. The Influence Of Model Learning Scientific Inquiry To The Self-Efficacy Of Students

Based on the research that has been done, the learning model applied in the classroom experiment is *scientific inquiry*. Models of *scientific inquiry* is never applied in the process of learning physics in high school so that make Al-Azhar students confusion against the learning model of *scientific inquiry*. Therefore, the researcher first describes the learning model of *scientific inquiry* to the students before the study began.

Of each meeting has done there is the influence model *scientific inquiry* against increased *self-efficacy* students . Improved that greatly influences the process of science skills students can be seen on phase the fourth of *scientific inquiry* i.e. phase draw conclusions. In this phase, students are more actively conveyed the conclusions of the experiment results against other groups. Students are also more confident in defending his argument and more actively argued with another group. It can also be seen in Table 4.13 shows the value of the postes *self-efficacy* of students increased from an average of pretes 55.28 to an average of 78.64 postes. Results from such postes shows insufficient values because there are still some students who are not actively doing practical work, and do not like learning physics.

The influence of model learning *scientific inquiry* will enhance *self-efficacy* of the students because the students trained investigations are applied on the model of *scientific inquiry* in the phase of the lesson. On this research obtained corroborating evidence that *self-efficacy* of students who get the treatment model of learning *scientific inquiry* was more better than students who get treatment learning conventional. Models of *scientific inquiry* give significant effects against the *self-efficacy* of students. The research is in line with research Ceylan (2016:610) explained that an increase in *self-efficacy* of students taught using instructional models *of scientific inquiry*.

The similarity of this research with previous research that is in terms of free variables that use the model of learning *scientific inquiry* and bound variables are used i.e. *self-efficacy* of students. The results showed that the average postes *self-efficacy* in experimental classes are better than in the control class. The difference with previous research i.e. research materials in biology. The learning model can be influential in theoretical and empirical, while theory indicates that existing models can increase the selected variable means the influential theoretical model counts time researchers have implementing a model of learning and has been tested using statistical tests and in accordance with the hypothesis that there is a meaning to the model has succeeded in the empirical. Weakness in the study is less consider and ignore the comprehension of the students so that students who are basically active in class learning outcomes has increased. As for students who are not active, just sit on the knowledge presented the teacher. Therefore an increase in the results of the study of physics students who obtained student was not significant when viewed from its average value. The next Researcher can consider and ignore the comprehension of the students so that all the students actively in the learning process.

V. CONCLUSION

Based on the results of analysis and discussion, it was obtained some conclusions as the following:

1. The Learning Model of *scientific inquiry* is designed to involve students in research issues that really orisisnil with the way they turned on investigation, helped them identify a conceptual problem or methodological in the field and invite them to devise ways of solving problems. Learning *scientific inquiry* gives the opportunity to the students to develop a deeper understanding of science concepts and forms of scientific knowledge of students.
2. Science process Skills of students using a learning model of *scientific inquiry* is better than students who use conventional learning. Science process skills of students in the classroom experiment above an average of 75.52 science process skills and grade control below an average of 57.28. The results showed that the

hypothesis of significant value 0.00 < α = 0.05 so that the hypothesis H_a welcome. There is the influence of model learning *scientific inquiry* science process skills against students.

3. *Self-efficacy* students who use the learning model of *scientific inquiry* is better than students who use conventional learning. *Self-efficacy* students in the class of experiments over an average of 78.64 and *self-efficacy* of students under the control of the class average of 66.28. The results showed that the hypothesis of significant value 0.00 < α = 0.05 so that the hypothesis H_a welcome. There is the influence of model learning *scientific inquiry* against the *self-efficacy* of students.

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