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The Effect Of Scientific Inquiry Model with Adobe Flash Programm and Scientific Attitudes Students' Science Process Skills At Senior High School

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Abstract **—This research aims to analyze the effect of scientific inquiry model with adobe flash cs6 media and scientific attitudes to the students science process skills, to analyze whether the science process skills of students with a higger scientific attitude is better than students with lower scientific attitude, to know the interaction of scientific inquiry learning model and scientific attitude toward students science process skill. This research is a quasi experimental research with two group pretest posttest design. The research population is all students of class X Senior High School 1 Hamparan Perak. The sample in this research was taken by cluster random sampling technique, that is as much as 2 classes. Class X-4 as an experimental class taught by scientific inquiry model with adobe flash cs6 media consists of 34 students, class X-3 as control class taught by conventional learning consisted of 34 students. This research instrument uses an essay test of science process skills and a scientific attitude questionnaire. The data were analyzed using two ways anava. The result of research shows that the science process skill of students taught by scientific inquiry model with adobe flash cs6 media is better than conventional learning, science process skill of students with higher scientific attitude is better than students with lower scientific attitude, there is interaction between scientific inquiry model with adobe flash cs6 media and conventional learning with scientific attitude in improving students science process skill.**

Keywords— Scientific Inquiry Learning Model, Adobe Flash CS6, Science Process Skill.

I. INTRODUCTION

Physics is one branch of Natural Science. Physics learning can be interpreted as a learning process that studies natural events. The process of building physics in students can be started by observing symptoms and natural behavior. The results of these observations can make students have an awareness of the scale observed. Learning physics is essentially a product, a process and a scientific attitude. Physics as a product includes facts, concepts, principles, theories and laws. As a process, physics performs scientific activities. Physicists determine the variables under study, by observing, comparing, hypothesizing, predicting, computing, measuring, and summarizing. These activities are part of the science process skills (SPS). SPS is the growth and development of certain skills in students so they can process information to obtain facts, concepts, and concept and value development [1] . SPS is important for every student because the skill is used in everyday life, improving scientific ability, quality and standard of living. SPS also influences private, social, and individual life in a globalized world. SPS serves as an effective competency to study science and technology, problem solving, individual and social development [2]

The importance of SPS does not match what is expected. Based on observations in senior high school 1 Hamparan Perak, it can be said that SPS students are still not developed because students are not trained to have SPS. Students rarely do practicum, so students are not accustomed to doing observation, measuring, predicting, concluding and experimenting. Students should have skills related to strengthening the cognitive structure in understanding, mastering and applying the physics concept so that students can solve physics problems from simple to complex, which is where the skill is characteristic of SPS.

The lack of development of SPS students in learning, one of which is influenced by the less varied learning model. Overcoming the problems in the learning above, need to be solved. One of the efforts to improve student's SPS is by applying scientific inquiry and learning media. The scientific inquiry learning model is a learning model that involves maximally all students' ability to search and investigate in a systematic, critical, logical, analytical way so that students can formulate their own findings confidently [3]. According [4] scientific inquiry learning model is better than conventional learning model. This is because the scientific inquiry learning model can help to provide constructive explanation so that the students learn by themselves through the investigation, so that in the investigation the students will be accustomed to make observations, formulate problems in mathematical modeling, linking the two rules and make students able to build new concepts In their knowledge, where some of these components are indicators of SPS. The use of media is also

very influential because with the media learners will more interested to learn in line [5] said that the use of learning media can help the learning process becomes dynamic so as to achieve the desired target. The function of media in the learning process is to increase the stimuli of learners in learning activities. According [6] said that the use of computerized learning media has a significant influence on attractiveness of students to learn the competence taught. Adobe flash is a softw that has the ability to draw as well as to animation, and easy to learn. Adobe flash is not only used in making animation, but in today's flash is also widely used for other purposes such as in the making of games, presentations, web building, learning animation, even in the making of films. With the adobe flash is expected to help in the learning process.

The scientific inquiry teaching model refers to the various ways in which scientists study nature and propose explanations based on evidence gained from their experience. Scientific inquiry also refers to student activities where they develop knowledge and understanding of scientific ideas, as well as an understanding of how scientists study nature [7]. Students are guided by teachers in understanding the concept through a series of exp ments. According [8] scientific inquiry learning model is designed to engage students in genuinely origin inquiry issues by confronting students with investigations, helping students identify conceptual or methodological issues in the field and invite students to be able to devise w s to address the problem.

The scientific inquiry learning model aims to help learners to develop the necessary intellectual and skill disciplines and invite learners to be active in solving a problem, so that this model is aptly used to improve student's SPS that is a skill used to study v ious concepts in completing various Problems in science. The use f scientific inquiry learning model can encourage learners to think and work on their own initiative, objective, honest and open. Through this learning model, students a aced with a scientific activity to train skilled students in obtaining and processing information through thi g activities by following scientific methods, such as skilled in observing, measuring, classifying, drawing conclusions, and communicating the findings. Students are directed to develop their own talents in processing and discovering their own scientific knowledge.

Students who are able to work on their own initiative, objective, honest, and open can be said that the student has a scientific attitude. Scientific attitudes are attitudes inherent in a person after studying the science, the condition of a person in responding, responding, and behaving based on science and scientific ethics that have been recognized truth [9].

Based on the observations made while the lesson is in progress, the students have not come up with a scientific attitude. Students tend to be passive in the learning process. Students only act as listeners and do not generate scientific attitudes. Students accept only what the teacher says without asking and analyzing the concept of physics described. Students look not want to know, not open and not refleksibel in thinking. Physics learning should be made to seek meaning, not just acquisition of knowledge so that students are able to use knowledge effectively, have a curiosity, sensitive to the environment, honest, objective, and able to think openly and reflection on the issues and things that are in the reach of one's experience, which is where the ability is an indicator of a scientific attitude.

The effects of a scientific attitude will be seen in the reaction of the learning process. Attitudes in this case are a combination, information, and emotion generated to respond to others in a fun or unpleasant way. Scientific attitudes can affect students' science process skills.

II. METHOD

The type of research is a quasi experiment with two groups pretest-posttest design. The study population is all students of class X SMA Negeri 1 Hamparan Perak academic year 2016/2017. The sample in the study was taken by cluster random sampling, that is as much as two classes amounted to 68 people. Class X-4 as an experimental class taught with scientific inquiry instruction model with adobe flash cs6 media, class X-3 as control class is taught with conventional learning which consist of 34 students each. The research instrument uses a SPS essay test consisting of 10 validated questions and a validated scientific attitude questionnaire. The resulting SPS data was analyzed using t-test with the help of SPSS.

III. RESULT

Pretest data in the form of essays SPS tests consisting of 10 questions. Pretes are given to see students' initial abilities in both classes. Description of SPS pretest data for experimental and control class can be seen in Table 1. Based on the data in Table 1 it can be seen that the average of pretest values in the experimental class and control classes are 45.60 and 45.51, respectively. Pretest implementation is done to see the students' initial ability by using different test, provided that the data come from normal and homogenous distributed populations

Based on Table 2, the significance value is 0.088 and 0.088, because the significant value is greater than 0.05 then H0 is accepted or the student's SPS score on the pretest test of the two classes does not differ significantly which means the two classes have the same SPS.

TABLE 1. PRETEST

Pretest Of SPS			
Class	N	Mean	Standart Deviation
Experiment	34	45,60	7,94
Control	34	45,51	6,87

TABLE 2. TEST OF DIFFERENCES IN EXPERIMENTAL CLASS AND CONTROL CLASS

		T	df	Sig. (2-tailed)
Value	Equal variances assumed	-6,006	60	0,000
	Equal variances not assumed	-6,060	57,497	0,000

Different treatments were given for 3 meetings in the experimental class and control class. The experimental class uses scientific inquiry instruction model with adobe flash cs6 media and control class using conventional learning. The application of scientific inquiry model adobe flash cs6 begins with forming a group. The teacher gives the problem related to the subject matter through the student worksheet (TSW), then instructed to make the hypothesis and carry out the practicum. Students make the results and discussion of the lab. The researcher analyzed the workmanship result of TSW that has been done by the students at every meeting. TSW assessment results can be viewed in Figure 1.

Based on Figure 1 of the results of student TSW can be seen the average value of student's TSW based on SPS indicators. The student scores for observing (OB) indicators, calculating (CC) and measuring (MA) are higher than other indicators, this is because the TSW students are required to observe, calculate and measure what they will do in the TSW. Unlike the case in the control class, learning is carried out with conventional learning. The teacher provides both oral and written explanations based on the handbook owned by the students. Students are given training questions to master the subject matter that has been given. Students are required to answer questions and write them in their practice book. This is the core of the treatment given by the teacher in the control class.

After both classes get treatment, then the second class is done postes test of SPS. Description of SPS postes data is presented in Table 3.

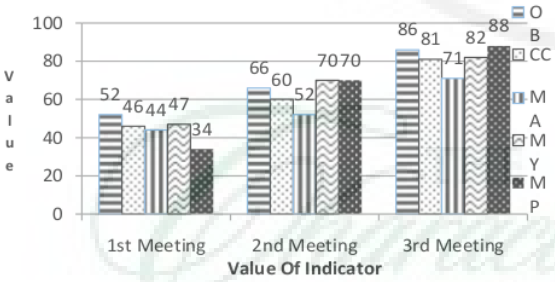

Figure 1 Average Results of Student TSW Based on SPS Indicators

TABLE 3. POSTEST OF SPS

Postest Of SPS			
Class	N	Mean	Standart Deviation
Experiment	34	73,10	9,80
Control	34	63,60	11,09

Based on Table 3, the mean student-grade SPS in the experimental class after treatment was 73.10 and for the average control class was 63.60, where the mean student-grade SPS score in the experimental class was greater than the control class.

The question of SPS that has been answered by the students is analyzed per point because of it. This analysis is useful to look at which indicators are difficult for students. The data analyzed were pretest and postes data of the students' SPS in the control class and the experimental class shown in Table 4.

Based on Table 4. we can see the differences in each indicator of the students' science process skills in the control and experimental classes. The highest answer SPS answer analysis in the experimental class is the experimental indicator (EX) with 77% value because in the experimental class the learning process is given the exercises to experiment and find their own answer when they do the practicum. The highest percentage of students' second answers to the experimental class was 58% with the observing indicator (OB) on question number 1.3. This is because at the time of teacher learning to face students on the problem, then students make a hypothesis and do the lab to find ways to overcome the problem so that students can menagamti well and correctly. The percentage of students' lowest answers to the experimental class is 15% with the compare indicator (CM) on question number 2. This is because when students do the SWS, students are not required to have reason in comparison.

TABLE 4. PERCENTAGE OF STUDENT VALUE EACH ITEM

No	Indicator Of SPS	Percentage of N-Gain SPS indicator (%)			
		Control	Category	Experiment	Category
1	Observing (OB)	40	Low	60	high
2	Compare (CM)	11	very low	19	low
3	Counting (CO)	42	Medium	42	medium
4	Calculating (CC)	37	Low	41	medium
5	Classify (CL)	34	Low	35	low
6	Measure (ME)	26	low	44	Medium
7	Experiment (EX)	25	low	77	High
8	Predict (PR)	30	Low	55	Medium

The highest percentage of students' answers to the control class is 42% with the counting indicator (SM) on questions 1 and 3. This is because the students learn to memorize the formula and the physical symbols. The lowest percentage of students' answers in the control class is 11% with the compare (CM) indicator on the 2nd and 26% questions with the measuring indicator (ME) on item number 5. This is because in the learning process the student is never confronted with issues related to Scale of a scale, so students are not accustomed to measuring a scale.

Postes data were analyzed using t-test provided that the data came from normally distributed and homogeneous populations. The results of t test post test data are presented in Table 5

Based on Table 5, the value of significance is obtained. of 0,000. The significance value of 0.000 <0.05, then it can be said that the test results reject H0 or accept Ha in the level of alpha 5%, thus it can be concluded that the model of scientific inquiry study influences the science process skills.

Based on tables 6 and 7 can be seen the average value of the student's SPS with the scientific attitude of the lower groups and upper groups for the control and experimental class. The mean grade of control class students with upper group scientific attitudes was 55.5 and the lower group was 54.5. The average grade of experimental class students with upper group scientific attitudes was 79.58 and the lower group was 61.5. Students with upper group scientific attitudes have higher scores than students with lower group scientific attitudes.

Data that has met the data feasibility test, then performed hypothesis testing using the test of General Linear Model (GLM) univariate at significance level α = 0,05. Students are classified based on scientific attitude. The group of students consists of two ie students who have lower group scientific attitudes and students who have a group upper scientific attitude. Two Way Anova Test with General Linear Model (GLM) univariate is used to see the scientific attitude and the students' process skill of the given learning model.

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Table 5. Test of Postes in Experiment Class and Control Class.

		t-test for Equality of Means		
		T	Df	Sig. (2-tailed)
Nilai	Equal variances assumed	-6,006	60	0,000
	Equal variances not assumed	-6,060	57,497	0,000

Two Way Anova Test with General Linear Model (GLM) univariate is used to see the scientific attitude and the students' process skill of the given learning model. Tables 6 and 7 of the group's upper scientific attitudes and scientific attitudes of the lower classes treated in experimental and control class classes.

Based on the above can be seen the average value of the student's SPS with the scientific attitude of the lower groups and upper groups for the control and experimental class. The mean grade of control class students with upper group scientific attitudes was 55.5 and the lower group was 54.5. The average grade of experimental class students with upper group scientific attitudes was 79.58 and the lower group was 61.5. Students with upper group scientific attitudes have higher scores than students with lower group scientific attitudes.

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Table. 6 SPS Data Based on Upper and Lower Group Scientific Attitudes in Control Class.

SPS With SI Group Down	Frequency	SPS With SI Group Upper	Frequency
42,5	1	42,5	1
52,5	1	52,5	2
55	1	55	1
57,5	1	72,5	1
65	1		
Sum	5	Sum	15
Mean	54,5	Mean	55,5

Table 7. SPS Data Based on Upper and Lower Group Scientific Attitudes in Experiment Class

SPS With SI Group Down	Frequency	SPS With SI Group Upper	Frequency
57,5	1	65	1
60	2	70	1
65	2	85	3
		87,5	1
Sum	5	Sum	6
Mean	61,5	Mean	79,58

IV. DISCUSSION

The results obtained in this study indicate that the scientific inquiry learning model with adobe flash cs6 media has an effect on the students' proccessing skills. This can be seen from the average va of pretest students in the experimental class is 45.60 and after being given treatment using scientific inquiry learning model, th student postes score of 73.10. This is because the stages of the scientific inquiry learning model can improve students' science process skills.

Stages of the scientific inquiry instruction model is presentation of problems to the students covering the methodology used in the investigation, then the s ents formulate the problems presented by the teacher so that students can identify difficulties in the investigation. Students ntify problems and find ways to overcome adversity. The scientific inquiry learning model is a learning model that develops a scientific way of thinking that helps to provide constructed explanations so that students learn more by themselves to investigate, solve and find solutions to blems [10].

The results of t study are in line with [11] which states that the scientific inquiry learning model is better than the conventional learning model. This is because the scientific inquiry learning model can make stud more curious about the problems conveyed by the teacher. This resear is also in line with research conducted by [12] which states that the u of scientific inquiry teaching model can encourage learners to think and work on their own initiative, objective, honest a open, supported by [13]. That used conceptual change to improve students 'cognitive abilities and students' science process skills, which used scientific instruction inquiry model which stated better than conventional learning.

Through this learning model, studen re faced with a scientific activity to train skilled students in obtaining and processing information th ugh thinking activities by following scientific methods, such as skilled in observing, measuring, classifying, drawing conclusions, and communicating the findings, so it can be concluded that the model Scientific inquiry ning can improve student learning outcomes [14]. The scientific inquiry le ing model is a learning model that involves maximally all students' ability to search and investigate in a systematic, critical, logical, analytical way so that students can formulate their own findings confidently [15].

The result of interaction between learning model and scientific attitude in this research is significant 0.000 <0,05, it means that the improvement of student's SPS in the experimental class is better when mpared to the control class. This is because the scientific inquiry learning model is a learning model that emphasizes the active learning of students in finding their own concepts. Learning with scientific inquiry, students tend to actively seek out through the process of investigation that ultimately comes to the content of the knowledge itself so that either directly or indirectly students will have a good SPS. Different analyzes were obtained on students who were taught with conventional learning. Students who have a group upper scientific attitude do not get enough space to practice their learning process learning skills.

This teacher-centered process limits students to create creations that develop students' skills so that student learning outcomes are not optimal. Students with lower group scientific attitudes, students who generally accept only the knowledge provided by the teacher will love the learning process in this lesson. Students only accept and memorize the knowledge given without understanding the process. The student learning outcomes also show an average that does not increase

V. CONCLUSIONS

Based on the results of research and discussion it can be obtained conclusion, namely the model of scientific inquiry learning with adobe flash cs6 media affect the students' science process skills. Based on the average score of students taught using scientific inquiry instruction model with adobe flash cs6 media obtained for 73.10 and for conventional learning of 63.60. Hypothesis test performed elded significance value of 0,035 <0,05 indicating that scientific inquiry learning model influenced student's science proces kill and scientific attitude to more influence than lower scientific attitude toward science process skill.

Suggestion

Based on the conclusions that have been presented, in accordance with the results obtained research, then the researchers give suggestions:

1. Teachers should take into account the time allocation used in applying scientific inquiry learning model, especially in conducting experiments and completing student worksheets (SWS).
2. Scientific learning inquiry model encourages students to be more active, then teachers and researchers should further consider the classroom used for student movement is not limited.
3. For teachers and further researchers should apply scientific inquiry learning model because it can encourage students to be more active, so that student learning outcomes are increasing.
4. For teachers and further researchers should take into account the observer (observer) in observation activities of students' science process skills in the classroom. Preferably the number of observers is conditioned by the number of students available for more effective observation.

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