The Effect of Learning Strategy and Achievement Motivation towards Learning Natural Science Outcome and Scientific Attitude at Eight Grade of Junior High School

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Abstract: *The purpose of this study is to examine the advance of guided discovery learning strategies and also to determine the significance differences of the interaction between the learning strategies and achievement motivation on students' learning natural science outcomes and scientific attitude. This study used a quasi-experimental pretest and posttest nonequivalent control-group research design. The data were analyzed by using MANOVA factorial design. It was calculated by using IBM SPSS Statistics 20 program for Windows. The result of this study shows that: (1) There are significant differences in the learning natural science outcome and scientific attitude between students' groups who use guided discovery learning strategy and a the students' groups who use expository strategy; (2) There are significant differences in the learning science outcome and scientific attitude of students between the students' groups who have high achievement motivation and the students' group who have low achievement motivation; and (3) There is no significant interaction effect between learning strategies and achievement motivation on learning science outcomes and scientific attitude of students.*
Keywords: *guided discovery, expository, achievement motivation, learning outcomes, and scientific attitude.*

I.   Introduction

Natural science is a method of inquiry, it is including ways of thinking, attitudes, and steps for the scientists to obtain scientific knowledge, such as observation, measurement, formulate and test hypotheses, collect data, experiment, and prediction. Based on these views, natural science should be seen as a way of thinking to understand the nature by conducting investigations and gathering some knowledge. Learning natural science in schools should emphasize on providing direct learning experience through development of skills and scientific attitude to develop competency. Learning science should be conducted by using the scientific method to cultivate the ability to think, work and communicate scientific attitude as well as an important aspect of life skills, (Zubaidah et al, 2014).

To achieve the goal of natural science teaching and learning activities, it requires to use these principles: (1) a student-centered, (2) develop students' creativity, (3) creating conditions fun and challenging, (4) uncharged values, ethics, aesthetics, logic, and kinetics, and (5) provide a diverse learning experience through the application of various strategies and methods of learning fun, contextual, effective, efficient, and meaningful, (Zubaidah et al, 2014).

Learning science is oriented on scientific process and centered on students that will have a positive impact on the formation of a scientific attitude and student learning outcomes. In other words, learning science in schools should emphasize on providing learning experiences directly through the use of stages and habits that can be trained scientists, to develop student competencies. It also expressed by Suastra (2009) that the cultivation of students' scientific attitude can be done by imitating how the scientists applied a scientific attitude in conducting researches.

However the most widely used in schools today is not the discovery learning "pure". In discovery learning "pure", the students are encouraged to learn on their own and the instruction is given at a minimal level or even not given at all. So when the teachers started using discovery learning, the teacher realized that to be effective, it needs to be modified, which then led to the term guided discovery learning (guided discovery learning).

Guided discovery learning is designed not to deliver material to the students as much as possible, but rather to develop a way of thinking, intellectual skills, learn to discover themselves through the real world and become independent students. Guided discovery learning is designed to engage students directly involved actively in the scientific process. In accordance with the syntax of guided discovery learning, scientific process undertaken by students include: provision of arousal, problem identification, data collection, data processing, verification, and generalization. According Eggen & Kauchak (2011), the guided discovery learning can encourage the understanding of matter in depth and develop students' critical thinking skills. When students provide evidence for their conclusion, it is surely the essence of critical thinking.

Based on above problems, it is necessary to improve natural science learning outcomes and scientific attitude of students in junior high. The application of guided discovery learning strategy could be expected to be used as an alternative in improving the quality of learning, learning natural science outcomes and scientific attitude junior high school students. The results of empirical observations on junior high school teachers in Mojokerto showed that teachers still do not understand, and less able to apply the learning strategy guided discovery well.

Based on above reason, researcher is interested in conducting research with the title "The Effect of Learning Strategies (Guided discovery vs Expository) and Achievement Motivation on Learning Natural Science Outcomes and Scientific Attitude at Eight Grade of Junior High School in Mojokerto".

This study examined the advantages of learning strategies among the learning strategy guided discovery (guided discovery learning) versus strategy expository (Expository learning) to determine the significance difference of the interaction between the learning strategies and achievement motivation on learning outcomes of science and scientific attitude eighth grade students in junior high school Mojokerto city.

II. Method

The populations of this research were all of students from eight grade junior high school in Mojokerto from 2014/2015 academic year. They were nine junior high school. The determined sample used cluster random sampling (random sampling technique group). The sample classes ware VIII-1 and VIII-4 (they were located in junior high school in mojokerto SMPN 6) as an experimental class; and grade 8-C and (4) class of 8-H (they were located at junior high school in mojokerto SMPN 4) as the control class. Fourth grade was given a pre-test to measure the equivalence or equality groups. From the pre-test was conducted different test average score tests using t-test (t-test).

This study applied two categories of research instruments as the tools of data collection, they were: (1) the test instrument, and (2) a questionnaire, which was consisting of: (a) achievement motivation questionnaire, and (b) scientific attitude questionnaire. Shaped instrument objective multiple choice test with four alternative answers was used. The test instrument in this research is divided into two categories,they are pre-test and post-test instruments.

The research instruments of achievement motivation was questionnaire which was prepared by the following indicators: (1) work hard, (2) expectations for success, (3) fear of failure, and (4) competition. Achievement motivation questionnaire was used in this study by using a Likert type attitude scale with four options / alternative answers developed by Robinson (in Cohen, 1976), and adapted by Degeng (1991). This scientific attitude questionnaire given at the end of treatment with the goal to be known scientific attitude of students after receiving treatment. Dimensions scientific attitudes were measured: (a) curiosity, (b) open-minded, (c) respect for the facts / evidence, and (d) critical thinking. These scientific attitude instruments was adopted by the dimensions of scientific attitude developed by Harlen and Gega (in Sudarma, 2012).

Trial of instruments was intended to determine the level of validity (accuracy) and reliability (regularity) instrument. Experiments conducted at 40 research instrument of class IX student of junior high school 9 Mojokerto from 2014/2015academic year. Instruments in the field trials conducted after approval by the validity of the research instrument content (content) based on rational consideration of the expert (expert judgment). Natural science expert field of study that was believed to give such consideration is a lecturer from Program Studi Pendidikan IPA/Sains Universitas Negeri Malang. The expert field of study who asked for consideration is the advisor of this research.

In determining the validity of each items, they could be viewed through value corrected item-total correlation in statistics total grains. In determining the construct validity achievement motivation questionnaire and scientific attitude used a factor analysis. For calculating the coefficient of reliability of the instrument, it used Cronbach alpha formula. Test validity, construct validity, and reliability of research instrument were done by using IBM SPSS Statistics 20 program for Windows.

Before going to hypothesis testing, it was necessary to test the assumptions or test data analysis requirements, they are: (1) The outlier test data by displaying a graph of data in the form of box plots; (2) The data normality using the Kolmogorov-Smirnov test; and (3) the homogeneity of variance-covariance matrix with Lavene test; while homogeneity of variance-covariance matrix is jointly used Boxa € ™ s M. To test the effects or differences between the learning strategies and achievement motivation on learning outcomes and student scientific attitude is MANOVA factorial design (Santoso, 2004: 221). Test assumptions and data analysis was done by using a support program IBM SPSS Statistics 20 for Windows.

III. Result

The data were analyzed by using MANOVA techniques to test hypotheses main influence and the influence of the interaction variable learning strategies and achievement motivation on outcome variables learn

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science and scientific attitude is calculated by using the application program of IBM SPSS Statistics 20 for Windows. The below are the data presented in Table 1.

Table 1. Effect of Test Results Top (Tests of Between-Subjects Effects)

Source	Dependent Variable	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	Learning_outcomes	5979,179[a]	3	1993,060	27,478	0,000
	Scientific_attitude	3985,088[b]	3	1328,363	58,761	0,000
Intercept	Learning_outcomes	640530,229	1	640530,229	8830,802	0,000
	Scientific_attitude	522433,389	1	522433,389	23110,318	0,000
Learning_strategy	Learning_outcomes	1628,839	1	1628,839	22,456	0,000
	Scientific_attitude	2488,774	1	2488,774	110,093	0,000
Achievement_motivation	Learning_outcomes	3798,877	1	3798,877	52,374	0,000
	Scientific_attitude	1281,528	1	1281,528	56,690	0,000
Learning_strategy * Achievement_motivation	Learning_outcomes	162,962	1	162,962	2,247	0,136
	Scientific_attitude	0,066	1	0,066	0,003	0,957
Error	Learning_outcomes	10154,710	140	72,534		
	Scientific_attitude	3164,849	140	22,606		
Total	Learning_outcomes	652406,000	144			
	Scientific_attitude	528073,000	144			
Corrected Total	Learning_outcomes	16133,889	143			
	Scientific_attitude	7149,937	143			

a. R Squared =0 ,371 (Adjusted R Squared = 0,357)
b. R Squared = 0,557 (Adjusted R Squared = 0,548)

Hypothesis Testing 1:
Manova Test Different Techniques Gained Probability Value (Sig.) Calculations For = 0.00 <0.05, Mean Ho1 Rejected. It Shows That There Were Significant Differences In Learning Outcomes Natural Science (Ipa) Between Groups Of Students Use Learning Strategies Guided Discovery And Expository.

Hypothesis Testing 2:
Manova Test Different Techniques Discovered That The Probability Value (Sig.) Calculations For = 0.00 <0.05. This Means That The Ho2 Was Rejected. It Showed That, There Were Significant Differences In Learning Outcomes Natural Science (Ipa) Between Groups Of Students Who Had High Achievement Motivation And Low Achievement Motivation.

Hypothesis Testing 3:
Manova Test Different Techniques Discovered That The Probability Value (Sig.) Calculations For = 0.316> 0.05. This Means That The Ho3 Was Received. It Showed That There Were No Significant Interaction Effect Between Learning Strategies And Achievement Motivation On Learning Outcomes Natural Science (Ipa).

Hypothesis Testing 4:
Manova Test Different Techniques Indicated that the probability value (sig.) Calculation = 0.00 <0.05. This means that the Ho4 was rejected. It showed that there were significant differences scientific attitude among the group of students who use the learning strategy guided discovery and expository.

Hypothesis Testing 5:
Manova Test Different Techniques Found That The Probability Value (Sig.) Calculation = 0.00 <0.05. This Means That The Ho5 Rejected. It Showed That There Were Significant Differences Scientific Attitude Among The Group Of Students Who Have High Achievement Motivation And Low Achievement Motivation.

Hypothesis Testing 6:
Manova Test Different Techniques Indicated That The Probability Value (Sig.) Calculation = 0.957> 0.05. This Means That The Ho6 Was Accepted. It Showed That There Were No Significant Interaction Effect Between Learning Strategies And Achievement motivation on scientific attitude eighth grade students junior high school.

IV. Discussion

The impact of Learning Strategies on Yield Science Class
Based on the results of hypothesis testing to-1, it could be shown that there were significant differences in learning natural science outcomes between students' groups who were treated by using guided discovery

learning strategies and students' groups who were treated by using expository teaching strategy. The significant differences of natural science learning outcomes and the two treatment groups, it showed that the learning natural science outcomes influenced by learning strategies used. In other words, it could be described that the application of guided discovery learning strategy was more effective in the acquisition process of science learning outcomes rather than the implementation of expository strategy.

The impact of Achievement Motivation towards Science Learning Outcomes

Based on the results of hypothesis testing to-2 can be concluded that there are significant differences in learning outcomes between students who have high achievement motivation and who have low achievement motivation. The results of descriptive statistical analysis showed that the group of students who have high achievement motivation earn mean better learning outcomes than the group of students who have low achievement motivation. Differences in Science learning outcomes significantly in both groups of students showed that the level of student achievement motivation affect the acquisition of student learning outcomes. The findings of this study are in line with previous studies conducted by Cavas (2011)

The effect of interaction between Learning Strategies and Achievement Motivation towards Science Learning Outcomes

On the results of hypothesis testing to-3 has been shown that no significant interaction effect between learning strategies and achievement motivation toward science learning outcomes in grade VIII junior high school. This is shown by the results of the analysis technique MANOVA, obtained F count = 2.247 and a significance level of 0.136> 0.05. The absence of interactions among the two independent variables, namely learning strategies and achievement motivation showed that each of the independent variables gives a strong influence on the dependent variable, ie learning outcomes separately and independently (separately). Results of research Salu (2013), and Susanti (2014) showed that there was no significant interaction effect between learning strategies and achievement motivation on the acquisition of student learning outcomes.

The impact of Learning Strategies on Students Scientific Attitude

Hypothesis test results 4th with MANOVA techniques obtained F count = 110.093 with significance (p) = 0.00 <0.05. It can be concluded that there are significant differences in scientific attitude among the group of students who are taught by learning strategies guided discovery and groups of students who are taught by expository strategy. The study's findings are consistent with the theoretical and empirical studies. Previous research on the effect of different learning strategies to the scientific attitude of students conducted by Ergul et al. (2011), Al Rabadi et al. (2013), and Afrida (2014).

The achievement motivation impact on Scientific Attitude Students

Based on the results of hypothesis testing to-5 with MANOVA techniques, found that the value of F count = 56.690 and the significance (p) = 0.00. So it is concluded that there are significant differences in scientific attitude among the group of students who have high achievement motivation with a group of students who have low achievement motivation in grade VIIIjunior high school. The big difference between the two groups of scientific attitude of students with different levels of achievement motivation showed that achievement motivation significantly affect the scientific attitude of students. The influence of achievement motivation on scientific attitude of students supported by theoretical and empirical studies through research findings obtained by Simatupang (2011), Cavas (2011), as well as Pyari & Shrama (2013). Students who have high achievement motivation have better scientific attitude.

The effect of interaction between Learning Strategies and Achievement Motivation of the Students Scientific Attitude

Based on the results of hypothesis testing to-6 indicated that no significant interaction effect between learning strategies and achievement motivation on scientific attitude eighth grade students of junior high school. This is supported by the results of the analysis with MANOVA technique, which is obtained F count = 0.003 and significance (p) = 0.956> 0.05.

The absence of interactions among the two independent variables, namely learning strategies and achievement motivation on scientific attitude shows that each independent variable that gives a strong influence on the outcome variable studied separately and independently (separately). As revealed by Hair et al. (1995) that the interaction does not occur if more than one independent variable consequences for the primary (main effect) apart on the dependent variable. The influence of each variable learning strategies and achievement motivation is equally strong against the scientific attitude of students, the interaction effect of the two independent variables on the dependent variable is expected weak and insignificant.

V. Conclusion

Based on the data analysis, it can be concluded that: (1) There were significant differences in learning natural science outcomes between The students' group who used guided discovery learning strategy and the students's group who used the strategy of expository eight grade students of junior high school; (2) There were significant differences in learning natural science outcomes between the students' group who had high achievement motivation with the students' group who had low achievement motivation at eight grade junior high school; (3) There were no significant interaction effect between learning strategies and achievement motivation on Junior High School eighth grade natural science students' learning outcomes; (4) There were significant differences in the scientific attitude among the students' group who used guided discovery learning strategy and the students's group who used the strategy of expository at eight grade students of junior high school; (5) There were significant differences in scientific attitude among the group of students who had high achievement motivation with the students'group who had low achievement motivation in grade VIII junior high school; and (6) There was no significant interaction effect between learning strategies and achievement motivation on scientific attitude at eighth grade students of junior high school.

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