LEARNING STYLES, LEARNING STRATEGIES AND LEARNING OUTCOMES OF SCIENCE IN PRIMARY SCHOOL

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ABSTRACT

This study aimed to examine the differences in the results of student learning in science among groups of students learn by using guided discovery learning strategy with a group of students who learn to use conventional learning strategies. Besides, it also tested the differences in learning outcomes between students who have an active learning style with reflective. Then analyzed whether there are interactions between the two learning strategies used against student learning outcomes. The method used in this research is quasi experiment with pretest-posttest non-equivalent control group design. The subjects were as many as 66 students of class V elementary school in North Lombok Indonesia. The instrument of this research is test result of learning and learning style questionnaire. Achievement test are obtained from the subject matter that is given at the time of the study, while the learning style questionnaire that is used to adapt the learning style of the Index of Learning Style (ILS) Felder-Solomon. Data analysis techniques are divided into two groups, namely data analysis to test requirements analysis and data analysis to test the hypothesis of the study. To test requirements analysis using test data normality and homogeneity of variance. Test data normality using the Kolmogorov-Smimov technique and homogeneity test variants using levene's test, while the analysis of data to test hypotheses using statistical parametric studies, the ANOVA analysis techniques (analisys of variance) two lanes. The conclusions of this study were (1) the learning strategy invention have better effect on student learning outcomes compared with conventional learning strategies, especially in science learning; (2) The student's learning style active to get the better learning than students who have learning styles reflective on both setrategi applied learning, and (3) There is no interaction between the learning strategies and learning styles on the learning outcomes of students in the subjects of Science Pengetahua nature in elementary school.

Keywords: learning styles, learning strategies and learning outcomes

INTRODUCTION

Effective learning emphasizes the importance of learning as a personal process, where each student builds knowledge and personal experience (Marzano, 1993). Knowledge and personal experiences are built by each student through interaction with the environment. Santrock (2004) states that one of the important teaching objectives is to help students understand the main concepts in a subject, not just considering the fact separate. Longworth (1999) states that understanding is the foundation for students to build insight and wisdom. Understanding a person characterized by his ability to articulate something through the ways forward ideas, perspectives and solutions ready pondered, criticized and used by others (Dunlap and Grabinger, 1996).

Willis (2000) states that a person is said to understand if it can demonstrate that the performance of such understanding at the level of higher capability (such as application,

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analysis, synthesis and evaluation), either in the same context and in a different context. This confirms that the understanding is a prerequisite to implement/apply the concept. Application or implementation of the concept is the students' skills in using concepts or abstractions or ingredients / things that have been learned in new situations and real (Reigeluth, 2009). Anderson (2001) stated that the understanding of the concept includes all conceptual knowledge, knowledge of the more complex covers (classifications and categories, principles and generalizations, theories, models and structure). While the application or the application is the use of abstractions (ideas, principles and theories) to solve new problems or real-life problems.

Build understanding and application of the concept is the result of learning is an important goal in teaching, including on the subjects of sciences. Conceptually, the vision of true science learning is to prepare students to have an understanding of science and technology, through the development of thinking skills, attitudes and skills in an effort to understand her so that they can manage their environment and can resolve problems in their environment. The purpose of science education in elementary schools by Bundu (2006) is a science achievement in terms of products, processes and scientific attitude. (1) In terms of products, students are expected to understand the concepts and their relation to everyday life; (2) In terms of the process, students are expected to have the ability to develop the knowledge, ideas, and apply the concepts generated to explain and solve problems found in everyday life; (3) In terms of attitudes and values of students are expected to have an interest in learning objects in their environment, being curious, industrious, critical, introspective, responsible, able to work together and independently as well as fostering a love of nature and simultaneously realizes the greatness of God.

In reality, the ideal goal of learning science as mentioned above are still having some problems. One of them identified through preliminary studies conducted at several elementary schools showed that students' skills in the field of science is still relatively low. It seemed to emphasize that the results of a survey conducted PISA (Programme for International Student Assessment) and TIMSS (Trends in International Mathematics and Science Study) which put Indonesia on the lower order in terms of the ability of students in science and mathematics. Observation process of learning science in some elementary school teachers often show still using traditional learning approach to learning strategies that simply transmit knowledge. This condition allegedly caused also by the majority of primary school teachers are classroom teachers who teach multiple subjects at once, so that the teacher allegedly having trouble or might not want to be bothered in choosing learning strategies that will be used for different subjects

In response to some of the obstacles in the learning of science as mentioned above, then the election strategy centered learning students (student centered) is a relevant option. For bejalar exact science is to facilitate students to do science in the process. Students are expected to work or doing science by the scientific method through observation (senses) are correct. By "learning to do" students will become a center of learning for the move in order to find the concepts learned (Martin, 1977). Meyers (1986) states that teachers do not just simply as a conduit of information, but must teach students to improve the ability to think and reason in order to increase their potential in society. By placing students at the center of learning poses means providing opportunities for students to construct things learned based on knowledge learned and interpret concepts, not providing information through text books (Dickinson, 1997).

Theoretically, to achieve mastery over a wide range of competencies in the learning process, then it needs to be combined with the appropriate learning strategies taking into account the

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characteristics of the students. Because the results of learning by the students affected by the applied learning strategies and student characteristics (Slavin, 1997). Learning outcomes are all effects that can be used as an indicator of the value of learning method under different conditions (Reigeluth, 2009). Different conditions such as the so-called Reigeluth and characteristics of students who Slavin referred to above, including the learning style.

One of the strategies that correspond to the demands of purpose as mentioned above is a discovery learning strategy. Arends (2004) states that the discovery learning is learning that engages students to solve problems. The same thing was stated Moore (2005) which states that the discovery learning involves students to solve problems in order to build knowledge and skills. Abbruscato (1988) gives some reason for using discovery learning strategy on science learning, namely: (1) acquire and remember information, (2) to make sense of the information obtained, (3) use and evaluate.

Straver (2007) explains that the emphasis on discovery learning and problem solving scientific will lead students to understand science in depth. The point is that the learning strategy is more emphasis on the process of the search for knowledge rather than the provision of knowledge, the student is seen as a subject of study that needs to be actively involved in the learning process. Thus, students are directed to find out for yourself the facts or build concepts needed. Relevant to this, it is to educate students to become community scientific, it should connect science learning with students' everyday experiences (Costu, 2008).

Based on preliminary observations at several elementary schools in North Lombok regency on the use of learning strategies discoveries in science subjects is still relatively rare. An overview of Learning Implementation Plan for teaching science shows that teachers typically use learning strategies expository and training or are still using conventional learning strategies. Learning strategy is considered good practice to inculcate certain habits. Also as a means to obtain a dexterity, precision, opportunity, and skills. Distinctive features of this strategy are activities such as repetition many times from the same thing. In this case, the student must first have been equipped with the theoretical knowledge to taste, then still guided by the teacher, the students were told to practice to become proficient and skilled. Nie and Lau (2006) states that Learning strategies drills (drill) is a conventional learning strategies with the characteristics, demands focus on textbooks, memory exercises, training and practice.

If the teachers are able to choose an appropriate learning strategy for a given learning material, then managed to determine the media and learning resources are appropriate to the learning objectives, then as proposed by Slavin (1997) is no less important to know the characteristics of the teacher is the student. In the concept of learning technology, it is very important and decisive, because knowledge of the initial characteristics of students will affect the appropriateness or suitability of the actions of educators in the process of learning. Davies (1984) mentions that as individuals every student has the characteristics or differences in terms of: (1) kecakapa and capabilities; (2) the knowledge, skills and attitudes; (3) personality and learning styles, and (4) age and experience. As for Charles (1980) stated that individual differences include: (1) the intellectual development, (2) skills in using symbols or language, (3) the background of experience, (4) learning styles, (5) personality, and (6) a description self. Davies and Charles agreed that individual differences include learning style.

There are various approaches made by scientists learning to identify students' learning styles. Eg learning styles are grouped by sensory preference and wholist-analytic (Riding & Cheema, 1991), Myers-Brigs Type Indicator (MBTI), Kolb's style, DePorter and Hernacki (1992), and the Felder-Silverman's learning style. Implementation of strategies for student-

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centered learning is made possible using the Felder-Silverman learning style. Type of learning style is also suitable for children of primary school age, because the question and answer choices to the instrument fairly easily understood by children.

The results of preliminary discussions with some class teachers in some primary schools in North Lombok show that so far teachers rarely even there has been an implementing learning strategies discoveries in science teaching and have not made the initial identification of the characteristics of student learning styles, so that educators do not know the trends and variations in the characteristics of student learning styles. Compatibility between learning strategies applied to the characteristics of student learning styles supposed to influence the results of science teaching. For this reason, this study will examine how the influence of the discovery learning strategies and training towards learning outcomes of students in terms of their learning styles on learning science in elementary school.

CONTEXT AND REVIEW OF LITERATURE

Learning Styles

DePorter and Hernacki (1992) states that a person's learning style is a combination of how he absorbs information and then organize and process the information. Learning styles shows how an individual in information processing with the aim to learn and apply. Vermunt (1992) uses the term learning style as a whole of the three domains, namely the process of cognition and affection of the material, mental models of learning and learning orientation. According to Bloom (1976) learner characteristics had a significant association with the acquisition of learning. Characteristics of learners is a trait or characteristic inherent in self-learners, one of which is a style of learning.

Learning styles determine how to learn the easiest and find the right strategy to achieve the learning objectives have been determined. Thus the learning style as one of the characteristics of learners theoretically influence on learning outcomes. Rassool GH & Rawaf S (2008) explains that to understand the learning styles of learners with good will can help teachers understand the shortcomings that occur in learners. Therefore, when teachers know their students learning style, will make it easier for him to implement appropriate learning strategies.

Experts have found a lot of variables that menpengaruhi way people learn. This includes physical factors, emotional, sociological, and environmental. Reality in everyday life shows that some people, for example, can learn best by bright light, and some others with dingy lighting. There are those who learn best in groups, while others again chose to study alone is most effective for them. Some people need music in the background, while others can not concentrate except in a quiet room. There are people who need a work environment that is orderly and neat, but others are more likely to hold everything so that all can be seen. The difference is then that makes the combination of how someone absorb then organize and manage information on getting and subsequently identified as the tendency of one's own learning style.

In this study adopts the Felder-Silverman learning style. Felder-Silverman Learning Style Dimensions (FSLSM) is one learning style model proposed by two scientists are Richard M. Felder one who is experienced in technical education and Linda K. Silverman. In FSLSM, student learning styles are categorized into four dimensions. yailu active / reflective, sensing / intuitive, visula / verbal, and sequential / global. To find a learning style, it is done using the Index of Learning Style (ILS) Questionnaire. ILS M.Fclder created by Richard and Linda Silverman, who then distributed with the cooperation of Richard M. Felder and Barbara A. Solomon at North Carolina State University. There is a 44 item questionnaire questions need

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to be answered by the respondents. ILS test 4 dimeusi learning style model, namely processing (active / reflective), perception (sensing / intuitive), input (visual / verbal) and comprehension (sequential / global).

Based on some of the above theory by considering the dimensions of suitability, so in this study will be used active-reflective learning style, because in learning by discovery strategy involves the participation of learners more because approach to learning based on students (student center). Students with a tendency to prefer active learning style of learning in which no physical activity or discussion, or to do something. While students who have learning style more reflective perform processing of information through introspection, thinking deeply about things before they try to do. The implication of the characteristics of students who have learning styles will learn more optimally active in the working groups, while reflective learners will learn optimally through their own work.

Learning Strategies

Learning strategy is a learning activity that must be done so that the teacher and student learning objectives can be achieved effectively and efficiently. Dick & Carey (2003) states that the learning strategy is a set of instructional materials and procedures that are used together to inflict on student learning outcomes. In this study, a learning strategy is defined as a plan that contains a series of activities designed to achieve specific educational objectives. Learning strategy is a plan of action (set of activities), including the use of methods and utilization of various resources or strength in learning which is structured to achieve the goal tertenu. In this case the goal of learning.

The general principle is that the use of learning strategies are not all suitable learning strategies used to achieve the goals and all circumstances. Each strategy has its own peculiarities. A case put forward by Killen (1998) that there is no teaching strategies better than others in all situations, so that teachers should be able to use a variety of teaching strategies, and make rational decisions about when each tend to be the most effective teaching strategies. Cohen's research results (2008) also showed that the instructional style mix will serve to disseminate information effectively, and to motivate students to learn.

In this study used two different learning strategies, the learning strategy guided discovery and Learning strategies drills (conventional) to improve student learning outcomes in science subjects in primary school learning style as a moderator variable. Each learning strategy certainly has advantages and disadvantages of each. For the following will be described in a row relates to the definition, advantages and disadvantages, as well as measures of both learning strategies are compiled from various sources.

The Discovery Guided Learning Strategy

Discovery learning is a teaching strategy that allows students to use the information to construct his own understanding by involving students to solve problems (Bruner, 1973). By Carin & Sund (1985) discovery learning is learning which facilitates students to learn through the mental process. Mental processes consist of activities to observe, classify, make allegations, explaining, measuring, and appealing the decision. Still according to Carin & Sund that discovery learning objectives is to develop critical thinking skills and knowledge through scientific activities. Thus, the implementation of discovery learning in the learning process will be able to help students build curiosity and motivation and improving intellectual ability.

In applying the invention instructional strategies, teachers act as mentors by providing opportunities for students to learn actively. In discovery learning, teachers must give students the chance to become a problem solver (problem solver). Teaching materials are not

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presented in its final form, but students are required to perform various activities to gather information, compare, categorize, analyze, integrate, reorganize the material and make conclusions.

According to Bruner (1973), there are four benefits that can be obtained by students with the application discovery learning methods, namely; (1) increase the intellectual potential; (2) change of reward extrinsic to intrinsic rewards; (3) learn heuristically or workmanship strategies to conduct discovery in the future; and (4) assist in conducting the retention and retrieval (retrieve information). Bruner discovery divide into two types, namely; unstructured discovery and guided discovery. Unstructured discovery arises in natural settings where students construct their own understanding, as a scientist who perform unique discovery in research projects, while guided discovery arise when the teacher gives an overview of the objectives to be achieved, collate the information so that the patterns can be found, and guide students towards the goal.

In this research, discovery learning strategies used were guided discovery (guided discovery) with the consideration that this type suitable for students who are accustomed to experiencing structured learning process. In this type of guided discovery learners present or present a problem to the students, then engage the students on to respond to a given problem, and then asked to solve the problem by making observations, exploration or experimentation. Learners determine the tools and materials needed to solve the problem, then the students determine the problem-solving activities with the guidance of the learners. Guidance and instructions given by learners from the beginning to the activity in the final stage of learning activities.

The advantages of discovery learning strategy guided by Carin & Sund (1985) are as follows: (1) Knowledge is built student with guided discovery strategy has the effect of better transfer than knowledge built by way of transfer of knowledge through ekspository method; (2) Learning invention can improve reasoning and the ability to think freely, and train cognitive skills; (3) Strategy invention can improve student curiosity; (4) Strategy invention can motivate students to work continuously to find the answers and motivation known to play an important role in the learning process; (5) Strategy menghidarkan discovery of the ways students learn by rote; (6) Helping students to improve and enhance the skills and cognitive processes; (7) The knowledge obtained through this method is very personal and powerful because it strengthens the understanding, retention and transfer; (8) Potential joy to the students, because of the growing sense of investigating and successfully; (9) This method allows students growing rapidly and according to their own pace; (10) causes the student to direct their own learning activities to engage their minds and their own motivation; (12) This method can help students reinforce the concept itself, since obtaining the trust cooperate with each other; (13) To help students eliminate skepticism (doubts) because it leads to the final and certain truths or certain; (14) The learning process includes aspects fellow students leading to the formation of the whole man; (15) Increasing the level of awards to students; (16) The possibility of students learning by using a variety of learning resources.

Also mentioned by Bruner that the advantages of learning strategies invention are: a) the student will understand the basic concepts and ideas better, b) help using cognitive ability and knowledge transfer in situations that new, c) encourage students to think and work, d) encourage students to think initiatives, and e) provide intrinsic satisfaction.

According to Gerlach and Ely (1980) form the stages of learning strategies imlpementasi invention are as follows: (1) Students are given cases, problems, examples, facts or particular phenomenon; (2) (a question to be answered about what is studied); (3) Students are required to examine the causal relationship of cases / issues through data collection, data analysis and the formulation of hypotheses or make assumptions or predictions. (Questions to answer why

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it happened so); (4) Students are required to prove the assumptions / predictions / hypotheses through theories, data collection and data analysis (questions to be answered about how to prove the reason kemengapaannya); (5) Students are required to make a conclusion or generalization, and teachers reinforce the value of the exposure (questions answered what has been produced / found); (6) Students are assigned by the teacher to seek a new case and prove through the process he had done as a reinforcement so that the learning experience can be stored for longer.

Conventional Learning Strategies (drills)

Learning strategies drills departs from the theory developed by Edward Thorndike. Thorndike (1961) stated that the basis of the study is the "Trial and error learning or selecting and connecting learning". Drill is a technique that can be interpreted as a teaching method in which students carry out activities of training, so that students have the dexterity or skill that is higher than what is learned. The method of training is a way of teaching by providing training on what they have learned so that students acquire a certain skill. Thus, it is understood that the drills is a way of presenting the lesson material with a road train students to master the lesson and skillfully so ingrained certain habits for improving student learning outcomes. In this case, the student must first have been equipped with the theoretical knowledge to taste, then still guided by the teacher, the students were told to practice to become proficient and skilled. Discovery learning strategies in the context of this research is positioned as strategy conventional learning because learning strategy is commonly used by teachers in teaching science in elementary schools.

Learning Outcomes

Comprehension is one cognitive domain C2 in Bloom's taxonomy. Comprehension is a mental process of adaptation and transformation of the science (Gardner, 1999). A person is said to understand if it can demonstrate the performance capability of understanding the higher level (such as application, analysis, synthesis, and evaluation) both in the same context and in a different context (Willis, 2000). Comprehension includes constructing meaning from verbal, written and graphic messages through interpreting, exemplifying, clarifying, summarizing, inferring, membandingka and explain (Anderson & Krathwohls, 2001). Understanding of the concept of learning outcomes in this context are the results achieved by the students after the learning process in a given time period stipulated in the test of understanding a concept that encompasses cognitive abilities in intellectual skills, the understanding of the concept as a category, principles and theories.

The application of the concept of a C3 cognitive domain in Bloom's taxonomy, are using or implementing a specific procedure to do the problem or solve the problem. Anderson and Krathwohl (2001) suggested that the application of the concept is the use of abstractions (ideas, principles, and theories) to solve new problems or real-life problems. This application capability requires students to use principles and knowledge in solving practical problems. The results of application of the concepts learned in the context of this research is the score achieved by students after attending a series of learning processes within a certain period stipulated in the test implementation of the concept of science subjects in primary schools.

METHOD

This research is an experiment to test the effect of independent variables on the dependent variable. Experimental design used was quasi experimental nonequivalent pretest-posttest control group design (Tuckman, 1999). The independent variables in this study are two learning strategies (discovery and drills). Variable moderator is learning style, while the dependent variable is the result of learning which consists of learning outcomes. In this study

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students as research subjects, while learning strategy is the study treatment was given to the subject. Because all the variables that may affect the treatment and study results may not be in control of everything, this study used a quasi approach eksperimenal with 2 x 2 factorial design of this research is concerned with the independent variables, and want to assess their effects either separately, or simultaneously. Factorial design to divide the groups based on the number of kinds of treatment and the different groups to be studied. As for the design of pretest-posttest quasi experimental non-equivalent control group design (adaptation of Tuckman, 1999) as in the following table:

Table 1. Factorial Experiment Design Patterns

Independent Variable / *Variable Moderator*		*Learning strategies*	
		Guided Discovery (X1)	*Conventional (Drills) (Y2)*
learning styles	Active (X1)	$X_1 Y_1$	$X_2 Y_1$
	Reflective (Y2)	$X_1 Y_2$	$X_2 Y_2$

Information :

$X_1 Y_1$ = Learning guided discovery with an active style

$X_2 Y_1$ = Learning drill with an active style

$X_1 Y_2$ = Learning guided discovery with a reflective style

$X_2 Y_2$ = Learning drill with reflective style

Subjects of this study is the fifth grade elementary school students in North Lombok. Prior research done first dilakaukan preliminary study that included drafting research instruments and sharing with teachers of subjects related to research activities to be conducted. Some instruments were prepared in this regard are: (1) a student's learning style questionnaire to identify learning styles, (2) Syllabus and Learning Program Plan subjects using guided discovery learning strategies and conventional. For possible obstacles that arise in research activities need to be carried out a pilot study by the subject teachers, it also serves to train teachers and students on how to implement learning strategies guided discovery and drill that was set before.

The stages of the activities to be carried out in the implementation of this research are: (1) provide pretest to both groups of the experimental class and control class, (2) identify the learning styles of the two groups by using questionnaires learning styles, (3) conducting learning by using a strategy that has been determined, (4) making observations, and (5) do posttest.

The research instrument consists of: (1) Test results of studying science subjects consisting of freetest and posttest. Achievement test used in this study comes from the subject matter of science class V (five) were given at the time of the study. The tests used to measure the understanding of the concept of using multiple-choice test with four possible answers. The test consists of 30 questions with a score of 1 for a correct answer and 0 for a wrong answer. The total score is then multiplied 2 multiple choice, so the highest score on a multiple choice test 60 and the low score is 0. The application of the concept to the test using the test description totaled 10 questions with the highest score and the lowest score of 0 to 4, so that the maximum score achieved 40 and lowest score 0. score summed subsequent learning outcomes, so that when learners obtain a perfect score, the results got a score of 100. this

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refers to the primary school assessment standards is between 0-100. The tests were given to students each between before and after treatment of learning using learning strategies guided discovery and conventional; (2) Questionnaire to measure learning style. Learning styles questionnaire used in this study to adapt the learning style of the Index of Learning Style (ILS) Felder-Solomon (2006). ILS's learning style questionnaire each comprising 11 questions for each dimension so that the total number of grains in the learning style questionnaire Felder as many as 44 items. Therefore, learning styles were measured in this study only look at one dimension that is active-reflective learning style, the questionnaire items used as many as 11 items in accordance with the active-reflective learning style. To determine whether the student's learning style tendency of the active learning style or reflective views of the final score questionnaire answers. If more answers are piliahan answer to a (-1), it means that the student concerned shall have the tendency of active learning style. Conversely if more people choose answer option b (1), then the student in question has a tendency reflective learning style.

Data collection activities include two stages, namely: (1) the preparation phase, covering: preliminary studies, preparation of learning tools and instruments of research, and training (pilot study) teaching science teacher fifth grade of primary school; (2) The implementation stage, include: conducting tests of learning styles, giving pretest, carry out the treatment of learning, and provide posttest.

Technical analysis of the data is divided into two groups, namely data analysis to test requirements analysis and data analysis to test the hypothesis of the study. (1) Test Requirements Analysis. To test requirements analysis using test data normality and homogeneity of variance. Test data normality using the Kolmogorov-Smimov technique and homogeneity test variants using levene's test. Test data normality and homogeneity test data is intended to satisfy the assumptions keparametrikan. Assumptions keparametrikan it is (a) a sample must come from a population that is distributed or dispersed normally, this is better known degan concept of assumption of normality, (b) the values of the variance in the groups of samples should be homogeneous, (c) data though it should be in the interval or ratio scale, and (d) the sample must be taken at random. (2) Research Hypothesis Testing. Analysis of data to test hypotheses using statistical parametric studies, the ANOVA analysis techniques (analysis of variance) two lanes. Analysis of 2 x 2 factorial variance was used to test the research hypothesis. Factorial ANOVA is a parametric statistical techniques used to test for differences between groups of data that came from two or more independent variables. To test the hypothesis of the study used SPSS for windows and tests performed on the null hypothesis significance level of 5%.

FINDINGS

The results of this study are the result of data analysis conducted on the research hypothesis. Hypothesis testing is done after all analysis requirements are met. Adapaun hypothesis tested in this study are as follows: (1) There are differences in learning outcomes between the groups of students who carry out the invention with students learning strategies that implement learning strategies drill? (2) There are differences in learning outcomes in science subjects among students who have an active and reflective learning style? (3) There is interaction between the learning strategies invention with drills learning strategies and learning styles (active-reflective) on learning outcomes of science subjects?

Hypothesis testing is done by analyzing the data of science learning outcomes. Adapaun calculation results SPSS by using analysis of variance (ANOVA) two lanes on the 0.05 significance level are presented in the following table.

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Table 2. Results of Data Analysis Tests of Between-Subjects Effects

Dependent Variable: Hasil Belajar

Source	Type III Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	932,374[a]	3	310,791	4,921	,004
Intercept	375219,116	1	375219,116	5940,827	,000
LearningStrategies	339,607	1	339,607	5,377	,024
LearningStyle	476,340	1	476,340	7,542	,008
LearningStrategies * LearningStyles	3,113	1	3,113	,049	,825
Error	3915,883	62	63,159		
Total	387129,000	66			
Corrected Total	4848,258	65			

a. R Squared = ,192 (Adjusted R Squared = ,153)

1. Differences in learning outcomes between the groups of students who carry out the invention with students learning strategies that implement Learning strategies drills can be known based on the calculation of the above data. The above table shows that the score of F count = 5.377 with a significance level of 0.024. This suggests that the significance level α = 0.024 is below the 0.05. Thus H0 is rejected, meaning that there are significant differences between the groups of students learning outcomes were studied using discovery learning strategy with a group of students who learn to use learning strategies training. By looking at average scores of learning outcomes in the two groups of students showed that the average score of the group learning outcomes of students learn to use learning strategies at 78.727 invention is greater than the average score of the group of students who learn by learning strategy drills at 73.485. It can be concluded that in general the learning outcomes of students who learn by discovery learning strategy is better than a group of students who learned with drills learning strategies.

2. Differences in learning outcomes in subjects of sciences among students who have an active and reflective learning style can also be seen with reference to the calculation results in the table above. The above table shows that learning outcomes in learning science scores obtained F count = 7.542 with a significance level of 0.008. This means that the significance level α = 0.008 are under 0.05. Thus, H0 is rejected. With the rejection of H0 it can be concluded that there are significant differences between the groups of student learning outcomes that have active learning styles reflective. By looking at average results of the study group of students who have an active learning style at 79.00, greater than the average results of the study group of students who have learning styles reflective of 73.031, it can be concluded that results for students with an active learning style better than students who have a tendency to reflective learning style.

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3. As to determine the effect of interaction between learning strategies invention to drills learning strategies and learning styles (active-reflective) on the results of study subjects sciences. Known through the score of F count = 0,049, with a significance level α = 0.825 is above the 0.05 significance level. That is H0, with diterimanyanya H0, it can be concluded that there is no interaction effect between learning strategies and learning styles to student learning outcomes.

DISCUSSION AND CONCLUSION

The results of this study indicate that the learning strategy guided discovery gives better results on learning outcomes when compared with the students' science learning strategy training. When referring to the minimum completeness criteria specified, this achievement has not shown optimal results. Therefore, it is necessary to study through research such as improving the quality of learning through action research. This is important because in experimental studies focus on testing komparasai oriented products, while research prefer the class action process in order to achieve learning success criteria.

The results of this study are relevant to the research results Balim (2009) which shows that the use of learning strategies invention can significantly improve achievement scores well on the cognitive and affective domains when compared to traditional teaching methods. Research conducted Swaak (2004) shows the results more or less the same, namely the discovery of more effective learning strategies in the acquisition and definition of intuitive knowledge when compared with expository strategy. Research Euphony (2010) meyebutkan that learning discovery inductive supported by a computer to facilitate the learning of mathematics in primary schools Taiwan effective in learning math concepts better when they are involved in the induction process, including a look at some examples of concepts, search for and test pattern behind the case, and generalize their findings with the written word right. With the support of computer technology, students can devote their thinking efforts in an individual learning tasks and find out for yourself. The conclusion from this study is that students have a better retention of concepts, especially for high school students through the learning materials discovery.

This result corresponds to a study conducted by Fayombo (2015) which revealed that students' learning styles helpful in determining the strategies used in the classroom. In addition, teaching strategies and learning styles contribute to the students' academic achievement. These findings support the importance of using different teaching strategies to accommodate different learning styles in an effort to improve students' academic achievement. The Hajaya study (2012) showed that there was no statistically significant difference in the average value of students on tests of reading achievement between groups of analytic learning style and learning style global group, as a learning strategy or learning style. However, the only factor affecting student achievement and motivation to learn to read in English is the interaction between the learning strategies and cognitive styles. Therefore Pashler (2008) states that there should be further studies to investigate the interaction of teaching methods and learning styles with the aim of improving the academic achievement of all students, including students.

Learning strategy used in this study was developed based on the curriculum applicable in the schools concerned to consider all the potential that exists in the location of a study, so that when it is used in other locations it is advised to pass up adjustment. Learning style is a moderator variable in this study were shown to influence on student learning outcomes. It is

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entirely possible moderator variables other than learning styles also affect student learning outcomes. Therefore, it is suggested further research conducted by other moderator variables.

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