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The Influence Of Cooperative Learning Type STAD Vs Expository And Cognitive Style On Learning Of Comprehension Physics Concept In Among Students At Tenth Grade Senior High School In East Jakarta, Indonesia

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ABSTRACT

This research aimed at examining: 1) The learning outcomes differences of the physics concept understanding between groups of students who learned through STAD type cooperative learning and expository learning; 2) The learning outcome differences of physics concept understanding among students with different cognitive styles; 3) The learning outcome differences of physics concept application among the students with different cognitive styles; 4) The learning outcome influencesof physics comprehension.
This research used a quasi-experimental research with factorial of non-equivalent control group design, which is implemented in six classes, determined by lottery, such as X_4 class, X_5 class, X_6 class, X_7 class, X_8 class X_9 class at SMAN 22 East Jakarta with 214 students altogether. Three classes were the experimental class and three other class were the control class. Learning outcomes data were collected through pretes and postes and analyzed by using statistical MANCOVA test helped by SPSS 15.
The result showed that : 1) STAD type learning strategy demonstrate learning outcomes of comprehension and application of physics concept better than expository learning strategies; 2) students who have field independent cognitive styles demonstrate learning outcomes of comprehension and application of physics concepts better than students who have a field dependent cognitive style; 3) there is an interaction between learning strategies and cognitive style on learning outcomes of comprehension and application of physics concepts.
Based on the result of this research, it is suggested that: 1) teachers implement STAD type cooperative learning strategies as one of the learning strategies in learning physics; 2) teachers pay attention to students cognitive styles before applying a certain learning strategy.

Keywords: learning strategy, STAD, expository, cognitive style, comprehension, concept application.

Introduction

Learning that takes place in high school classes, today is still dominated by the teacher, it means that teachers give more lessons, while students just sit listening to a lecture from the teacher. Occasionally interspersed debriefing by the teachers to motivate students to be more enthusiastic about learning and be attentive to the teacher. When giving the lessons teacher just just quotes the contents of textbook into the mind of the student without elaborating more or explaining further the content to the understanding of the student, everything is exactly what is stated in the book. All exercises given refer to the student handbook and teachers only, no innovation at all of the teachers, as it became the only source of learning for teachers and students.

Based on this, the researchers conducting research related to the presence of students in that school apply the learning model that elevates the student to be able to cooperate, discuss and help each other as well as mutual respect and support in learning. These learning is a student team achievement division (STAD) cooperative learning which expects students to cooperate, discuss, help each other in learning and learning process will be completed when all the students have grasped the material provided by the teacher. Regarding to cognitive styles, each student while receive learning, students process information which is coming to them. Acceptable subject material receive by the students is physics materials according to the first semester curriculum after a specialization such as the dynamics of particle motion, First Newton's law, Second Newton's law, Third Newton's law, the friction style and circular motion are studied in aspects of understanding and application of the concepts of physics for grade X Senior High School students.

Problem selection in study is motivated by the findings of several studies that have been conducted by previous researchers regarding the amount of time needed by students to solve physics problems and group need a long time to solve the problem actually finding so many mistakes (Lee. Y. J 2010). Cooperative learning is a teaching strategy which two teams cooperate in tasks of small groups study in (a) combine; uses heterogeneous teams, (b) maintaining individual accountability, (c) promote positive interdependence, (d) processing inoculate meaning of the groups (e) social skills sharpen. Otherwise Qaisara Perveen (2012) suggested that cooperative learning method is more than traditional methods in teaching general science for grade IX students. There is a difference between post-test scores increased. There is an increase in overall performance of the experimental group as a result of treatment.

Rosemary C. Reilly. *et al*. (2010) opinion about the effects for students in choosing a friend for cooperative groups in science classes, the results showed that the low ability students in choosing a partner group produces greater feelings of

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alienation, no effect on academic, low self-esteem and strength, reduces the willingness to cooperate with friends. They feel that Students' academic achievement was not supported by their friends in the classroom. Meanwhile Luu Trong Tuan (2010) argues that cooperative learning prepares students to become effective participants not only in the classroom but also outside the classroom . Substantial change of the interdependence of teachers and students, from teacher to peer tutoring and lessons learned from the gathering, to learn to share and explore with students how to use the power of cooperation. Meanwhile, Dat Van Tran (2012) suggested that students in the experimental group considered cooperative instruction more, student-centered and experienced significantly greater improvements in both achievement and retention of students in the control group.

Similar to his previous opinion, C. Hsiung M. (2010) argues that cooperative learning has a higher efficiency than individualistic learning methods and experienced a significant improvement in academic performance compared with individualistic learning methods. Chuang P. J. (2012), suggests that cooperative learning methods provide better learning outcomes when compared with a random grouping. Student achievement increased about 17.64%, the average score increased and the standard deviation decreases.

Sheng W. X. (2010) define cooperative learning as a group learning situation of students in all levels of performance, working together in groups toward a common goal, sharing a common problem or task such that they can only succeed in completing the work through behavior. Promoting student autonomy in language learning cooperative interdependence while holding the contributions of individuals and businesses responsible. So the brain-based instructional strategies can be improved on math achievement over the lecture method. Manolas E, *et al* (2011) argues that cooperative learning is not the same as collaborative learning, this is more of a collaborative system that is controlled by the teacher.

Take a look at learning objectives, there are two main targets in the learning activities, such as (1) individual target and (2) group target. Individual target, learning is conducted to provide an opportunity for individual students to do their activities so as to enhance the ability of individual students. For group target, the learning needed to build cooperation and harmony within the group so that students as a group member developed by individually in their groups. In the group, students will grow and develop together. Encourage good learning on students' learning activeness that ultimately improving student learning outcomes. Thus refers to the learning paradigm must change the placement of the student as the center of learning activity and not teacher-centered.

STAD type cooperative learning aims to combine existing knowledge of students both from themselves and from their classmates with new knowledge about physics received from the teachers with discussion and cooperation, by all members of the group. Because the knowledge of the students have been acquired cooperatively through discussion then existing knowledge of students are put into consideration in the development of STAD type cooperative learning strategies.

Research Problem Frameworks

Based on the questions and the fact that results from several studies above, through this research will be reviewed "The influence of learning strategies (STAD type cooperative and expository) and cognitive style (field independent and field dependent) affected on the learning outcomes of understanding and physics concept application in grade X senior high school".

Research Purposes

In more detail, this research aimed at examining: 1) The learning outcome differences of the physics concept understanding between groups of students who learned through STAD type cooperative learning and expository learning; 2) The learning outcome differences of physics concept understanding among students with different cognitive styles; 3) The learning outcome differences of physics concept application among the students with different cognitive styles; 4) The learning outcome influences of physics comprehension.

Literature Review

Cooperative learning emphasizes on the use of goals and success of the group, so that a given task is a learning task group. The important thing in cooperative learning is groups awards, individual responsibility and the same opportunities for success (Slavin, 2008:10). In addition it shows that the cooperative learning group awards and individual responsibility is very important to improve performance of basic skills (Slavin, 1989, 2008:11). Not enough just to students working together, but also should have a reason to support each other's achievements. Further cooperative learning provide guidance when students gain an appreciation for doing things better than they did before, then students will be more motivated to obtain rewards in the learning task, due to successful achieve recognition of advances is not something that is difficult or too easy to do.

From several studies, it can be said that the effectiveness of cooperative is better than competitive and individualistic efforts, it can be operated easily by educators, concrete and easy to implement, conceptual, flexible, making its use more widespread (Johnson & Johnson, 1999, Slavin, 1991). Teachers use cooperative learning, practice and philosophy of learning is cooperation. Cooperative Practice certainly in line with human nature which must cooperate with each other.

Learning strategy is a plan of action including the use of strategies and utilization of various resources or strength in learning. The use of cooperative methods gives students the opportunity to share or sharing of learning, such as : (1) freely express opinions , feelings or specialized knowledge in order to improve group progress. (2) listen carefully to relate what is known in the group with what is known personally, (3) provide facts and reasons to support the opinion of the group. Further cooperation is cooperation and interaction among students with different abilities, expected in response to each student or react: (1) listen carefully so that they can ask questions to clarify, (2) free to respond the questions,

interests, issues and concerns, (3) ensure that students have the same opportunity to speak and argue . Thus cooperative learning is a form of collaboration in small groups that have different levels of ability.

Correspondingly, Slavin (2000) argues that cooperative learning is an instructional strategy that emphasizes cooperation within groups of students with different abilities. Students in small groups work together to solve a given task, and is responsible for themselve and the group (Slavin, 1995). The results obtained by Johnson & Johnson (1999:124), the results of the study indicate that cooperative learning has a positive influence on the development of students. The meaning of various positive influence is to increase student achievement, improve retention, to achieve a level of high-level reasoning, encourage the growth of intrinsic motivation, more appropriate to improve human relations heterogeneous, increasing the positive nature of children to school, increasing the positive nature of the childs to the teachers, improving self-esteem, increase positive social adjustment behavior and improve life skills work together. The characteristics of cooperative learning are : (1) each member has a role and each task, (2) direct interaction between students, (3) each group member is responsible for their learning and their group, (4) the teacher helps students to develop interpersonal skills and group (5) teachers interact with groups when needed .

STAD Cooperative Learning (Student Team Achievement Division)

STAD type cooperative learning was originally developed by Slavin and his colleagues at the University of John Hopskin United States. STAD type is one type of the most simple and widely used of all cooperative learning, for students who are new to cooperative learning (Slavin, 1995). STAD type cooperative Learning activities consists of five major components, such as (a) the presentation of the class, (b) the activities of the group, (c) test, (d) determining a score improvement of individual and (e) group award. Each class has the opportunity to receive an award. The award is an incentive in cooperative learning and individual group, can motivate students to improve their learning efforts.

STAD type cooperative learning easily followed by students, aims to encourage students to discuss, assist each other in completing the task, mastering the material and eventually applying the skills. Slavin (1995) suggests a five- step implementation of cooperative learning, such as : preparation, the main objective of this study is for the teacher presenting the subject matter according to plan. Each initial STAD type cooperative learning begins with the presentation of a class that includes the opening, development and guided practice of the whole lesson. Appreciation group, this activity is done at the end of each meeting and learning activities carried out in the following stages stages : a) calculate an individual score group, b) value is calculated based on the difference of individual development gains initial test scores and final test, so that each member has a same opportunity to contribute the maximum score for the group. Teachers providing award without praise, balanced development of the most active groups, most solid group and best group. It's to give motivation to the students to be more active and creative in learning.

Expository Learning

Expository comes from the concept of the exposition which means giving an explanation. In the context of expository learning strategies of a teacher to explain the facts, ideas and other important information to students. Expository learning is a strategy commonly used by teachers without the use of special techniques for organizing learning content. With the presentation of learning strategies expository discussion tends to refer to the presentation material contained in textbooks, teachers do not pay attention to whether the material is in conformity with the order of presentation of learning hierarchy from simple to complex. In learning with expository strategy relationship between the subject matter presented are not related.

Expository strategies used to provide advance information; definitions, principles and concepts of the subject matter as well as providing examples of problem-solving exercises in the form of verbal, demonstration, discussion and assignments. Students follow the pattern set by the teacher carefully. The use of expository strategy leads to the acceptance of the content of the lesson to the students directly. The use of this strategy, students do not need to search and find out the facts by themselves, concepts and principles have been presented by a teacher. Learning activities using expository strategy tends to be centered to the teacher.

Expository learning strategy is basically a learning process that is generally carried out by the teacher, with the pattern of teacher -centered delivery of content. The term comes from the concept of the exposition, which means giving an explanation. In the context of expository learning strategies of teachers to say or explain the facts, ideas and other important information to students. Expository learning is rooted in the theory of information processing learning or reception learning. Expository learning progresses through several stages , as follows : (a) the presentation of information, the presentation of this information can be done with lectures, exercises or demonstrations; (b) administration of the test, to find out to what extent the level of acceptance or perception, recall, understanding and repeat again if necessary, (c) provision of training to the students to apply the general principles and the example given in the form of test to test, and (d) providing the opportunity to apply the information learned in different situations and problems.

Stages in learning with expository strategy are: (1) the preliminary stages of the teacher asking subjects the material to be covered and learning objectives to be achieved, students follow the notes if necessary, (2) the presentation stage, the teacher delivering learning materials with lectures and frequently asked questions and concludes with a summary or the delivery of exercises, (3) in the closing stages of evaluation form of teacher conduct tests and follow-up activities such as assignments in order to repair and enrichment / deepening of the material.

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Cognitive Style

Cognitive style is characteristic of the way a person processes information, feel and behave in a learning situation (Jerold, W.APPS, 1990). Cognitive style has been described as the way a person processes information and intellectual abilities (cognitive). Cognitive style is a construct that was in some way different from someone in the face and take the strategy of learning situations. How someone uses to gain knowledge, learn and influence the way a person processes information, feel and behave in a learning situation. How to be consistent is done by someone in capturing stimulus or information, remembering, thinking and solve the problem as well as one standard pattern in the learning activities of students who felt comfortable, appropriate and steady.

Cognitive style was classified according to the underlying notion. Analyzing the various opinions that have been stated earlier, cognitive style is typical of the way that students use in the face and take learning strategies, including gathering information, processing the information. Nasution (1997) suggested the average difference between the cognitive style of field dependent and field independent by doing longitudinal studies that students have a field dependent cognitive style are: (1) highly influenced by the environment or rely on a lot depends on the environment and education as a child, (2) Educated to always pay attention to other people, (3) to remember things in a social context, (4) slow speech in order to understand other people, (5) has a broad social relationships, (6) requires more clues to understand something and (7) is more sensitive to criticism, need to be encouraged and avoid criticism of a personal nature.

Cognitive style in adults can be divided into two, the field dependent (FD) and field independent (FI). The differences can be seen both by their characteristics (Woolfolk, 2004; Altun, 2006; Daniels, 1996). Physics is a subject that is suitable for someone with a field independent cognitive styles. Someone who has a field independent cognitive style prefer to observe the processing of the information themselve. Students can receive the parts separately. Based on the characteristics of these two cognitive styles, it can be estimated that a person who has the educational background of science and mathematics tend to be familiar with the field independent cognitive styles, whereas someone who has a background of social groups tend to be familiar with the field-dependent cognitive style. One dimension of cognitive style that needs to be considered in education is a cognitive style that is distinguished by psychological differences, namely : cognitive style field independent and field dependent cognitive style. Based on the suitability of cognitive style field only between two independent and field dependent. Conformity is the relationship between field -dependent cognitive style or prominence of solidarity (sense of community, cooperative).

Suitability field independent cognitive styles in the base of the relationship between person and person, individual orientation appears that the dominant orientation is basically an individual 's ability to appreciate the achievement. Each person has a different cognitive style in problem solving. The cognitive styles is a relatively permanent personality trait that is used to describe a person's behavior in dealing with various situations. According to Abdurrahman (1999) there are two dimensions gained great importance in the assessment of children in the learning disabilities that cognitive style dimension of attachment and detachment on the environment (field dependent and field independent).

Field Independent Cognitive Style

The opinions expressed on the characteristics of a field independent cognitive styles including Nasution (1997), explains that students who have cognitive style idependent fields are: (1) do not care about other people's norms, (2) speaks quickly regardless of the perception of others, (3) is less concerned with social relationships, (4) does not require detailed instructions, and (5) be able to accept criticism and improvement. Someone who has a field independent cognitive style prefer to observe the processing of the information by themselve. Students receive separate parts. Field independent groups can work well within the scope of mathematics and science, which analysis capabilities is very necessary. Characteristics of students who have a field independent cognitive styles are: (1) focusing on the details of the material, (2) focusing on the facts and principles, (3) seldom hold physical contact with the teacher, (4) interactions with teachers is limited to the tasks being performed, looking for non-social compliments, (5) likes to work alone, (6) loved the competition and (7) can organize by themselve.

This opinion is similar with Winkel (2009) that the characteristics of students who have a field independent cognitive style is: tend to pay more attention to parts and components in a pattern and often also more oriented toward task completion rather than social relationships. Students belonging to this group is easier to analyze a problem and rearrange the parts as well as more diligent in finding a solution by themselve, but is less sensitive to the subject matter contained social complications. Based on the theoretical analysis above, field independent cognitive styles are the ways of collecting and learning activities that are not or less influenced by the environment. One of the cognitive styles that influence individual characteristics are field dependent cognitive style. While the characteristics of students who are not affected by the environmental field called cognitive style indepedent.

From these characters can be seen that individuals who have a field independent cognitive styles have a tendency to respond to stimuli using their own perception and analysis. Learning conditions that allow students who have the cognitive style of learning maximally independent fields, such as: (1) provide a learning environment to learn individually, (2) provided more opportunities to learn and find a concept or principle by themselves, (3) provided more many sources and learning materials, (4) learning only a few provide guidance and objectives; (5) prioritize instruction and individual objectives; (6) provided the opportunity to make a summary, a pattern or concept map based on their thinking.

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Field Dependent Cognitive Style

Field dependent cognitive style is the perception of the student to get information that affected the surrounding environment. Someone who has a field-dependent cognitive style are likely to receive an information pattern as a whole, not separating one part to another part. Students are not familiar with social relationships such as those with a field-dependent cognitive style. Students have difficulty when focusing on one aspect of the situation, taking things in detail, analyzing the patterns into different sections.

Students work well in groups, have a good memory for social information and more pleasure from language and history. Cognitive styles can affect an individual is dependent cognitive style. Field dependent cognitive style are likely to receive an information pattern as a whole, not separating one part to another part. Students have difficulty focusing on one aspect of the situation, taking things that are important detail, analyzing the patterns into different sections. Students have a tendency to work well in groups, have a good memory for social information and more pleasure from language and history.

Some of the characteristics of individuals who have cognitive style dependent, such as: (1) tend to think globally, looking at the object as a whole with their environment, so that perceptions are easily affected by changes in the environment, (2) tend to accept the existing structure because they have the ability to restructure, (3) sosisal orientation, so it seemed good-natured, friendly, thoughtful, considerate and compassionate towards people, (4) tend to choose a profession that emphasizes the social skills, (5) follows the existing goals, and (6) tend to work with priority external motivation and more interested in the external reinforcement, in the form of gifts, compliments or encouragement from others.

Meanwhile Winkel (2009) describes the characteristics of people who have a field-dependent cognitive style is tended to see a pattern as a whole and often oriented towards fellow human beings and social relationships. Students belonging to this group quickly gained global impression and easy to remember information associated with social relationships, but it is difficult to process unstructured subject matter and are more sensitive to negative criticism.

From these characteristics it appears that field-dependent individuals have a tendency to respond to a stimulus using the environment as a basic requirement perception and tend to view the pattern as a whole with no separate parts. Someone who has a field-dependent cognitive style receive something globally have difficulty in separating themselves from the surrounding circumstances. Meanwhile, the characteristics of students who have a field-dependent cognitive style are: (1) understanding concepts and materials globally, (2) connecting the concepts with personal experience, (3) search for clues and teacher's demonstrations, (4) seek praise strengthen relationships with teachers, (5) likes to work with others, sensitive to the feelings and opinions, (6) fun working together and (7) likes organizing assigned by the teacher.

Someone who has a field -dependent cognitive style : (1) require strong support from others in the vicinity, (2) tend to be timid and anxious, and (3) difficult to take the initiative and work alone, tend to be obedient or subject to other people,especially in position of authority. Meanwhile Borich (1996) suggested the characteristics of students who have a field -dependent cognitive style are: (1) understand the concepts and materials globally, (2) connecting the concepts with personal experience, (3) search for clues and teacher demonstrations, (4) seek praise strengthen relationships with teachers, (5) love working with others and sensitive to the feelings and opinions, (6) fun working together and (7) likes organizing assigned by the teacher. Identify the characteristics of a field -dependent cognitive style are: (1) receiving globally, (2) make global differences between concepts, (3) has a social orientation, (4) external factors that require strengthening and objectives and (5) is motivated either by verbal praise, support teachers, and external rewards with other people see the value of the task. Based on the analysis above, the theory is a field-dependent cognitive style in this study are typical ways that students use to gather information, process information and make decisions in a learning activity that is influenced by the environment or rely on the environment.

Physics Learning

Physics is one part of the sciences. Science is a branch of knowledge that originated from natural phenomena. Physics is defined as a set of objects and knowledge about natural phenomena derived from the ideas and investigations conducted by the skills of scientists experimenting using the scientific method. This definition gives the sense that physics is a branch of knowledge which is built based on the observation and classification of data, and are usually prepared and verified in the laws that are quantitative, which involves the application of mathematical reasoning and analysis of data on natural phenomena. Thus, the essence of physics is the science of natural phenomena that are poured of facts, concepts, principles and laws and verified through a series of events in the scientific method . Physics has two sides, namely as a process and the other side as a product. Physical process is an effort to examine the collection and use of evidence and develop ideas. One theory was initially in the form of an imaginative idea but as long as there is an imaginative idea can present some evidence.

Physics subject is one of science subjects in clumps. The essence of physics is the science object observation of nature with all its contents, including the earth, plants, animals and humans. Physics is a science that is obtained using methods based on observation. Physics deals with how to find out about the nature systematically, so that science is not only a mastery of knowledge in the form of a collection of facts, concepts, or principles, but also a process of discovery.

Physics is a science that was born and developed through the steps of observation, problem formulation, testing hypotheses through experimentation, conclusions and filing theories or concepts. Function of physics subjects are: (1) provide sufficient knowledge base, both to be able to continue to pursue higher education and to be applied in daily life, (2) develop skills in acquiring, developing and applying concepts

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of physics; (3) inculcate scientific attitude and train students to use the scientific method to solve their problems, (4) draw attention to the regularity of nature and all its beauty, so students are encouraged to love and glorify God; (5) fostering the creative and innovative power of students; (6) help students understand new ideas or information in the field of science and technology; (7) nurture and develop students' interest towards physics.

Based on the above, it can be concluded that physics is a part of science that allows humans acquire the scientific truths of natural phenomena, making it easier to describe and govern nature. In addition, physics is a subject that serves to develop all aspects of learning that students have better cognitive, affective and psychomotor so as to have a confident attitude to life provision in the community.

Interaction Effect of STAD Cooperative Learning

In the learning process the teacher plays a key role in the development of business students' thinking skills. Teachers need to understand the appropriate learning strategies to make students capable of critical thinking and encourage students to dare to think critically. Active learning will yield a good understanding of the concept and can last a long time and are more likely to associate the material or concepts possessed compared to the accepted concept that time. To achieve an understanding of the concepts, problem identification can help create an atmosphere for students thinking and success in learning is determined by the creation of the fun learning process.

Application of STAD type can help students more easily process information, because it is supported by the interactions that occur in cooperative learning. The advantage is to teach students to believe in teachers, the ability to think with, seek information from other sources and learn from other students; encourage students to express ideas verbally and compare it with their ideas, and help students learn to respect good students or weak and also receive the differences. STAD type cooperative learning is a picture of cooperation between individuals with one another in a particular bond. The bond between a cause with others feel to be in one place with a common goal, each person is expected to be in that bond.

Thought is only a simple description of what is implied about the cooperative. Cooperative learning is one which is based on constructivist learning. In STAD type cooperative class, students learn more than other friends among members rather than by the teacher. There are five basic things that need to be taken to ensure that STAD type cooperative learning goes well: (1) positive independence, would work well if each member of the group was aligned with the other members. This means that one person will not succeed unless the other members also feel success. Regardless of the efforts made by each member not only for yourself but for all members of the group. Positive Self-reliance is the core STAD type cooperative learning, (2) Increased interaction, when teachers emphasize positive self-reliance, the teacher should provide the opportunity for students to get to know each other, helping each other, support each other, give each other encouragement and praise for the work done in learning. Cognitive activity and group dynamics occurs when students included learning to know each other, how to solve the problem, discuss the concepts that will be done, explain to classmates and connect with the lesson, (3) the responsibility of the individual, the goal of cooperative learning groups in STAD type is that each member becoming of greater knowledge. Students learn together so that it can perform better as individuals. Individual responsibility would happen if the actions of each individual is assessed and the results are notified to the group. Useful to the individual responsibility of each member of the group to determine : (a) who need more help, support and encouragement in completing the task, (b) that students do not just rely on the work of a friend, (4) interpersonal and small group 's ability to STAD type cooperative learning, in addition to subject matter, students should also learn about social skills. In order to achieve a high quality of cooperation, each member of the group to learn social skills, leadership, make decisions, build trust, communication and conflict management skills as well as learn the subject matter, (5) the management of the group will be successful if each member of the group discuss goals and maintain effective working relationships.

Learning Outcome

The ability of a person obtained after learning activities is called learning outcomes. Learning outcomes is the ability of a person after he received a learning experience. These capabilities are relatively permanent and beneficial for him. Obtained as learning ability are grouped into three domains. This is in accordance with the opinion of Bloom (1981) which classifies learning outcomes into three domains, such as cognitive, affective and psychomotor. Cognitive learning outcomes relating to intellectual consisting of six aspects, such as: (1) knowledge or memory, (2) comprehension, (3) application, (4) analysis, (5) synthesis, and (6) evaluation. Attitude regarding the affective domain consisting of five aspects, such as: (1) interest, (2) attitude, (3) awards, (4) the values and (5) emotional control.

According to Winkel (2009) studied the knowledge that one begins to know the different kinds of data about the incidence, circumstances, objects and people. While the study results are functional knowledge of someone who has studied the facts will see the relationship between one thing and another. In the knowledge that is available, the information is stored separately, in earth sciences and in physics. Information functional knowledge about the physics, integrated with existing knowledge, eg knowledge of earth science, the knowledge during the learning process needs to be put in order, the new knowledge associated with existing knowledge, functional knowledge that is ultimately owned. While the psychomotor domain consists of six levels of classification, such as: (1) reflex, (2) skill in basic movements, (3) perceptual ability, (4) physical ability, (5) movement skills, and (6) communication ability. Bloom (1981) third domain analyzed an overall capability that occurs in a person, the cognitive domains associated with a person's ability to think, affective domain being associated with a person's ability and psychomotor domains related to one's ability to behave.

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In daily life many people doing actual activity is a symptom of learning. The ability to perform learning activities acquired the ability to remember at first. In the course of studying a process of change of direction had not been able to afford. The process of change that occurs during a certain period. The change in this pattern of behavior that indicates there has been a learning process. If more and more capabilities to acquired personal property, then the more the changes that have been experienced by the person.

Changes that occur in a person are not all learning outcomes. Changes due to growth and maturity is not a learning outcomes, but rather occurs because of impulse instinct. Similarly, the changes that occur as a result of fatigue or illness can not be called as a learning outcomes, because such changes occur beyond human ability. Learning is a change in behavior or ability to behave relatively permanent that is not caused by a temporary condition of the body such as illness or drugs. It is clear that the changes that occur because learning does not arise simply because learning more requires conscious activity, a psychic activities and exercises.

Based on those opinions, it can be concluded that the definition of learning includes four things: (1) learning is shown by a change in behavior in a person, after learning the student is able to work on something that can not be done before, (2) changes in behavior is relatively permanent applies not just behavior change obtained from studying the results can last a long time in a person and become a private property that will not be erased just like that, (3) changes in behavior that is the result of experience, which requires interaction with the environment, and (4) a change in behavior was not a temporary state of the body such as illness or drugs.

Physics Concept Comprehension

Always found the fact that the subjects of physics is believed by many students as a difficult subject. It certainly affects the students' learning interests. Series of attempts have been made so that students can learn well without being burdened by the thought of hard lessons of physics. This new understanding can be gained when the students have gone through the process of learning. In the process of learning will encounter certain obstacles that will result in students experiencing learning difficulties. If it happens without any further treatment will result in the achievement of learning achieved by students is low. Physics students' understanding of the material that has been taught, can be known by a new teacher evaluation when it is held. In evaluating the students' understanding, then teachers need tests. The test is a barometer of whether students have a clear understanding of the concept that has been taught.

According to Zulaiha (2006:19), learning outcomes are assessed in physics consists of three aspects. The third aspect is the understanding of concepts, reasoning and communication, and problem solving. The third aspect of the criteria are : 1) Understanding the concept consisting of : (a) restate a concept, (b) classify objects according to certain characteristics, (c) provide examples and non- examples of the concept, (d) presenting concepts in various forms of mathematical representations; (e) develop a necessary condition or a sufficient condition of a concept; (f) use, utilize and select procedures, (g) apply concepts and problem solving. 2) Reasoning and communication include (a) presents the physics statements, either orally, in writing, drawings and diagrams, (b) filed allegations;(c) draw conclusions, compile evidence, giving reasons or evidence of the validity of the solution; (d) draw conclusions from statements; (e) examine the validity of the argument; (f) find the pattern or nature of symptoms to make generalizations. 3) Solving problems include: (a) demonstrate an understanding of the problem, (b) organize the data and choose the relevant information in problem solving, (c) presents a problem in many forms; (d) selecting approaches and appropriate methods of problem solving, (e) develop problem-solving strategies ; (f) create and interpret a model of a problem.

Furthermore Ernawati (2003:8) argues that the reference to understanding is the ability to capture notions like being able to disclose a material that is presented in another form that can be understood, is able to provide interpretation and is able to classify. Comprehension is a conception that can be digested or understood by students so as to understand what is meant, is able to find a way to express and explore the possibility of conception related.

Interaction Effect of STAD Learning and Cognitive Style

STAD type cooperative learning provide a place for students in group activities in a flexible learning (Slavin, 2008: 246), the study provides the opportunity for students trying to better be able to master the subject matter that was their job. The importance of STAD type cooperative learning is a good discussion to explore the material in accordance with the capabilities of cognitive style. Being able to master the material being studied and became a leader for the group. To strengthen students' ability to use knowledge of their activities to understand the subject matter which it is responsible.

The aim of STAD type learning is to improve responsibility of students who have cognitive style field independent and field dependent, on their own learning and to create a dependency with the group. In addition to the student charged with the responsibility to learn and master the lessons, demanded to be able to communicate something to others is good and right. Students are given the opportunity to demonstrate their ability to reproduce the existing knowledge according to their ability to strengthen their cognitive style.

Furthermore Slavin (1995: 78-79) suggests teachers to continue with the following actions : (a) ask the students to gather with their friends in the group, with bench adjacent to the group members gathered;(b) distribute worksheets and answer sheets; (c) encourages the students to work together in pairs or as a group depending on the purpose of the study. When answering the questions of physics lesson, students are working on their own and check with the other. When faced questions that only require short answers, students are allowed to test each other, with friends taking over the answer sheet or try to answer the questions: (a) ensure that students understand that the worksheets is to learn, not to be held and

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filled, so important for students to hold the answer sheets to be checked; (b) ask the students to explain answers to each member of the group and check the different answers to the answer, (c) students worked in groups and the teacher in the classroom toured, praised the group that worked well, sat with each group to listen to the working group members.

In STAD type learning strategy combining group activities and individual responsibility are expected to improve student achievement. But the need for an assessment test to determine whether cooperative learning strategy is gives influence on the size of school achievement (Slavin, 2008:41). If the student's cognitive style combined with STAD type cooperative learning, the students are expected to have good cognitive abilities, will more easily master the subject matter and will be easy to complete the task. However, students should always be the goal of learning the completion of the task, prior knowledge is needed to complete the task. Based on the characteristics of the learning strategy, the cooperative STAD type learning strategy has the opportunity to empower students to learn. How much influence STAD type cooperative learning interactions and cognitive styles in learning activities that are effectively also impacted on the quality of learning outcomes.

STAD type cooperative learning provide a place for students to perform learning activities in a flexible group (Slavin, 2008: 246), provides the opportunity for students to try and be able to master the subject matter that was their job. STAD type cooperative learning is maximum discussion to understand the material. To strengthen the ability of students to do the activity, students are expected to use prior knowledge or explore subject matter that is still remembered previous students. Prior knowledge is important to appear again in an attempt to clarify the understanding to minimize misconceptions (Reigeluth, 2009:51). STAD type cooperative learning strategy combining group activities and individual responsibility that can improve student learning achievement.

Research Method

The concept of this study aims to apply the method of STAD type cooperative learning vs. expository learning and cognitive style on learning physics in grade X SMA Negeri 22 Jakarta Timur. There is a free variable that learning methods that is STAD type cooperative learning and expository learning. Moderator variable is composed of cognitive style field dependent and field independent cognitive styles. Dependent variable is the learning outcomes of understanding and application of physics concepts. The study was conducted at SMAN 22 in grade X which consists of 6 classes, 3 classes for the experimental class and 3 classes as the control class. To determine experimental group and the control group based on the learning device that consists of lesson plan using STAD type cooperative learning model, work sheet and student assessment sheets.

The data collected from the learning outcomes, evaluation, pretest and posttest studied in class, by using test questions that have been tested. Testing differences in treatment outcomes using multivariate analysis of covariance (MANCOVA) which has two covariates, such as: pre-test and evaluation, two factors, such as: cooperative learning strategies and expository and two dependent variables, such as: the results of the understanding and application of physics concepts. By using SPSS 15, significance level (sig) = 5% or $\alpha = 0.05$ (Winarsunu 2007: 99-100, Ghozali 2008:115-117). According to Agus Widaryono (2010:211) significance test multivriat to detect differences in the centroid of two or more groups can be evaluated with the test statistics, such as: (1) Pilla's, (2) Hotelling's Trace, (3) Wilks' Lambda and (4) Roy's Larges root.

Testing the validity of the instrument using the Pearson product moment correlation coefficient. Instrument is valid if the item has any questions positive correlation coefficient more than 0.3 and a significance value less than ? = 0.05. There is a significant correlation between the total value of the item questions. Conversely, if the analysis results obtained significance value is more than ? = 0.05, it is certain that the item is not a valid question and not included in subsequent analyzes. While the question items that have a positive correlation coefficient and significance value is less than ? = 0.05 total of 18 question items. The research instrument variable constituent comprehension physics concepts is valid 18 question items.

Research Instrument Reliability Test

Decision-making criteria is if the value of the coefficient Guttman Split Half is greater than 0.6 then the research instrument has been reliable. The results of reliability testing with SPSS software is to understanding physics concepts, Guttman Split Half of 0.780 and the coefficient is more than 0.6. It can be concluded that the research instrument has been reliable. The level of difficulty of the grain problem is the proportion of participants correctly answered the test question items, which are listed in the following table:

Table. 1: Level of difficulty Classification Question

Question's Difficulty	Proportion Value
Difficult	0.00 - 0.30
Medium	0.31 - 0.70
Easy	0.71 - 1.00

Furthermore Arikunto (2010) states that a good question is a matter which is in the medium category, which is a matter that has a difficulty level between .31 to 0.70. Here are the results of testing the level of difficulty of items were:

Table. 2: Testing Results The level of difficulty of Question

Question	Proportion (%)	Category	Question	Proportion (%)	Category
	60.53	Medium	P58	65.79	Medium
P11	68.42	Medium	P23	68.42	Medium
P12	65.79	Medium	P28	68.42	Medium
P13	34.21	Medium	P29	68.42	Medium
P14	57.89	Medium	P32	68.42	Medium
P15	28.95	Difficult	P33	65.79	Medium
P16	60.53	Medium	P38	39.47	Medium
P17	68.42	Medium	P39	21.05	Difficult
P18	65.79	Medium	P41	23.68	Difficult

Based on the results of testing the level of difficulty, there are 3 questions that have answers correct proportion is less than 30%. The third item indicates that the question is in the difficult category, so all these questions are not used to measure students' understanding of physics concepts.

Different Power Questions

Different power question is a question's ability to distinguish between students who are good with students who are less intelligent. Figures show the amount of power difference is called the index of discrimination (D). Different categories of questions of power can be seen in the following table:

Table. 3: Different Power Question's Category

Index of Discrimination (D)	Category
0.00 - 0.20	Poor
0.21 - 0.40	Fair
0.41 - 0.71	Good
0.71 - 1.00	Excellent

By testing different power above, it can be explained that the 15 questions used to measure understanding of physics concepts is in the fair category and good category. So the number of questions used are 15 questions.

Description of Research Variables

Cognitive style of the students are divided into two categories, field independent and field dependent. Grouping students by cognitive style performed by cognitive style test scores. In each class, students' cognitive style scores are sorted from lowest score to highest score. Then take 27% of students with the lowest sequence to represent students who have a field-dependent cognitive style and 27% of students with the highest order to represent students who have a field independent cognitive styles.

Pretest values measured variables to determine the extent of understanding physics concepts is absorbed by the student before the student is given the treatment. Students who have a high pretest score, indicating that the student has a high level of understanding of the physics concepts. Instead of students who have a low pretest score, indicating that the student have a low understanding of the physics concepts. Based on the results of the descriptive analysis, it appears that the value of the pretest ranged from 0 to 7.5 with an average of 3.627.

Evaluation score variable is to determine the extent to which the concept of understanding and application of physics concepts absorbed by the students during the learning strategies that use expository learning and STAD type. Students had high evaluation score, indicating that the student has had a high level of understanding of the concepts of physics at the time of learning. Instead of students who have a low evaluation score, indicating that the student has a low understanding and application of physics concepts. Descriptive analysis, evaluation scores ranged from 3.17 to 8.50, with an average of 6.64. In STAD type groups, measuring the score of the evaluation is done by giving lab, either on a group or individually. Evaluation score of students with learning strategy STAD type both groups and individuals, performed using t test. Obtained an average score of 8.134 practicum in groups with a standard deviation of 0.624. While the average score of 5.743 practicum individually with a standard deviation of 1.443.

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The test results using the t test, t obtained at 15.011 and p value of 0.000 . T value is greater than t table (15.011 > 1.982) and the p value of less than 0.05 (0.000 < 0.05). These tests indicate that there are significant differences between the average values in the group practicum higher than the average value of individual practicum. Practical value as a group are better than practicum values individually. Variable value of post test (learning outcomes) were measured to determine the final outcome of the learning is done with either expository or STAD strategy. Descriptive variables learning outcomes of understanding physics concepts and learning outcomes variable application of physics concepts. The results of the descriptive analysis, it is seen that the value of the learning outcomes of understanding physics concepts ranged from 2 to 10, with an average of 5.67. To test for significant differences in learning outcomes in learning strategies (expository and type STAD), cognitive style (field dependent and field independent), the value of pre-test and the value of the results of the evaluation of learning strategies and their interaction with cognitive style . The analysis tool is used Multivariate Analysis of Covariance (MANCOVA) with a 2x2 factorial design (2 strategy category and 2 cognitive styles category). Tests of significance in the analysis by using MANCOVA with two stages is multivariate testing and univariate testing. Multivariate testing using the test statistic Pillay's Trace, Wilk's Lambda, Hotelling's Trace and Roy's Largest Root. The existence of significant differences seen if the multivariate p value <0.05. Meanwhile, if the p value> 0.05 indicates no difference in multivariate analyzes. The following table presents the results of multivariate MANCOVA:

Table. 4: Multivariate Testing Result

Independent Variable	Test Statistic	Value	F	p-Value	Remarks
Learning Strategy	Phillai's Trace	0.083	5.085	0.008	Significant
	Wilks' Lambda	0.917	5.085	0.008	Significant
	Hotelling's Trace	0.09	5.085	0.008	Significant
	Roy's Largest Root	0.09	5.085	0.008	Significant
Cognitive Style	Phillai's Trace	0.069	4.18	0.018	Significant
	Wilks' Lambda	0.931	4.18	0.018	Significant
Cognitive Learning	Hotelling's Trace	0.074	4.18	0.018	Significant
	Roy's Largest Root	0.074	4.18	0.018	Significant
	Phillai's Trace	0.009	0.528	0.592	Not Significant
	Wilks' Lambda	0.991	0.528	0.592	Not Significant
Strategy*	Hotelling's Trace	0.009	0.528	0.592	Not Significant
	Roy's Largest Root	0.009	0.528	0.592	Not Significant
	Phillai's Trace	0.087	5.395	0.006	Significant
Pretest	Wilks' Lambda	0.913	5.395	0.006	Significant
	Hotelling's Trace	0.095	5.395	0.006	Significant
	Roy's Largest Root	0.095	5.395	0.006	Significant
Evaluation	Phillai's Trace	0.158	10.579	0	Significant
	Wilks' Lambda	0.842	10.579	0	Significant
	Hotelling's Trace	0.187	10.579	0	Significant
	Roy's Largest Root	0.187	10.579	0	Significant

While the univariate tests, a significant difference seen if the F count > F table and a P-value < 0.05, while the difference is not significant if the F count < F table and a P-value> 0.05. The following table presents the results of univariate MANCOVA:

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Table. 5: Univariate Test Result

Independent Variable	Dependent Variable	F-Count	F-Table	P-Value
Learning Strategy	Concept Comprehension	8.791		0.004**
	Application Comprehension	3.763		0.055*
Cognitive Style	Concept Comprehension	7.958		0.006**
	Application Comprehension	1.955		0.165
Cognitive	Concept Comprehension	0.423	3.924	0.517
Learning Strategy*	Application Comprehension	0.366		0.547
Pretest	Concept Comprehension	8.157		0.005**
	Application Comprehension	5.457		0.021**
Evaluation	Concept Comprehension	0.046		0.831
	Application Comprehension	20.366		0.000**

Prior to further interpretation, will be tested assumptions underlying MANCOVA as follows:

MANCOVA Assumptions Test

There are two assumptions that must be met in the MANCOVA. The first is the assumption of homogeneity of covariance, the second is the assumption of multivariate normality of the residuals. The following table presents the results of testing the assumptions in the MANCOVA.

Table. 6: MANCOVA Assumption Test

Assumption	Test Score	P-Value	Remarks
Homogeneity Covariance	10.552	0.335	Fulfilled
Residual normality of Phiysics	1.238	0.093	Fulfilled
Concept Comprehension			
Residual Normality of Physics	0.686	0.734	Fulfilled
Concept Application			

Resource: Primary Data Processed, 2013

The first assumption is the assumption of homogeneity of covariance, indicating that the multivariate variance between groups were tested to be the same (homogeneous). Testing this assumption using Box's M Test. Covariance is called homogeneous or the same if the value of the P-value of 0.335. Since the P-Value> 0.05 (0.335> 0.05) indicates that the covariance between homogeneous groups, thus the assumption of homogeneity of covariance are met.

The second assumption is the assumption of multivariate normality of the residuals, meaning that the residuals (errors) MANCOVA models are expected to spread to normal. Testing this assumption using the Kolmogorov-Smirnov Test. Residual normal spread if P-Value> 0.05. The test results in the above table shows that the P-Value 0.093 and 0.734. Because the value of the P-Value> 0.05 (0.093 and 0.734> 0.05) indicates that the assumption of normality of the residuals are met. Thus both MANCOVA assumptions are met, therefore MANCOVA results deserve to be interpreted.

Learning Outcomes Differences in Learning Group Strategy

Two groups of learning strategies is expository and STAD type, a total of 103 students were given the expository teaching strategies and there are 58 students who are involved in the analysis process. a total of 111 students are given learning strategy STAD and there were 62 students who were included in the analysis process. The following learning outcomes are presented descriptive understanding of the concept and application of physics concepts in both groups learning strategies.

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Table. 7: Learning Outcomes are Presented Descriptive Understanding of The Concept and Application of Physics Concept in Group of Learning Strategy

Group	Average	Total	Deviation Std.	Multivariat P-Value	Univariate P-Value
Learning Outcomes of Concept Comprehension					
Expository	5.395	58	1.732		0.004
STAD	6.559	62	1.701		
Learning Outcomes of Concept Application				0.008	
Expository	4.759	58	2.025		0.005
STAD	6.542	62	1.921		

Based on the above table, the average value of understanding physics concepts expository group was 5.395 with a standard deviation of 1.732 and the average value of understanding physics concepts STAD type group was 6.559 with a standard deviation of 1.701. While the average value of the application of physics concepts expository group of 4.759 with a standard deviation of 2.025 and the average value of the application of physics concepts STAD type group of 6.524 with a standard deviation of 1.921 . Multivariate testing, a score of 5,085 F - count with the P -value of 0.008. P-value < 0.05 indicates that multivariate, learning outcomes of understanding and application of physics concepts in expository groups differed significantly with STAD type group. The average value of learning outcomes of understanding and application of physics concepts together showed a significant difference where the average value of the STAD type group is higher than the expository group. Overall, the learning strategy STAD type demonstrate learning outcomes of understanding and application of physics concepts better than expository learning strategies.

Univariate testing learning outcomes of understanding physics concepts, values obtained in table F-count equal to 8.791 with a P-value of 0.004. P-value <0.05 indicates that the univariate, learning outcomes of understanding physics concepts in expository groups differed significantly with STAD type group. The average value of learning outcomes of understanding physics concepts which showed a significant difference in the average value of STAD type group is higher than in the expository. So that the learning strategy STAD type demonstrate learning outcomes of understanding physics concepts better than expository learning strategies.

Univariate testing results of the application of learning physics concepts, values obtained in table F-count equal to 3.763 with a P-value of 0.055. P-value <0.05 indicates that the univariate, the results of the application of learning physics concepts in expository groups differed significantly with STAD type group at the level of ? = 0.10. The average value of the results of the application of learning physics concepts which showed a significant difference in the average value of STAD type group is higher than in the expository. So that the learning strategy STAD type shows the results of learning applications of physics concepts better than expository learning strategies.

Learning Outcomes Differences in Cognitive Style Group

In this study, cognitive styles are divided in two groups, field dependent and field independent. A total of 85 students have dependent cognitive style and as many as 60 students were included in the analysis. A total of 129 students have a field independent cognitive style and there were 60 students who were included in the analysis. Descriptive understanding of the concept of learning outcomes and application of physics concepts in both groups cognitive style described as follows:

Table. 8: Learning Outcomes Descriptive of Concept Comprehension and Physics Concept Application in Cognitive Style Group

Group	Average	Total	Deviation Std.	Multivariat P-Value	Univariat P-Value
Learning Outcomes of Concept Comprehension					
Dependent	5.614	60	1.938		0.006
Independent	6.378	60	1.59		
Learning Outcomes of Concept Application					
Dependent	5.433	60	2.269		0.018
Independent	5.908	60	2.024		0.165

Based on the table above, it can be explained that the average value of understanding the physics concept of field dependent group was 5.614 with a standard deviation of 1.938 and the average value of understanding physics concepts field independent group of 6,378 with a standard deviation of 1.590. While the average value of the application of physics concepts field dependent group of 5,433 with standard deviation of 2,269 and the average value of the group field application of physics concepts independent of 5.908 with a standard deviation of 2.024. In multivariate F - calculated value obtained at 4.180 with P - Value of 0.018. Value P - Value < 0.05 indicates that multivariate, learning outcomes of understanding and application of physics concepts in the field -dependent groups differed significantly with field

independent group. So overall cognitive styles showed significant differences learning outcomes of understanding and application of physics where the concept of cognitive style independent field study results show understanding of the concept and application of physics concepts better than field -dependent cognitive style. The results of univariate tests of learning outcomes of understanding physics concepts, the F-count value obtained by 7.958 with P-value of 0.006. P-value <0.05 indicates that the univariate, learning outcomes of understanding physics concepts in the field-dependent groups differed significantly with field independent group. The average value of the dependent field group is higher than in the independent field. The analysis showed that there were significant differences in learning outcomes of understanding physics concepts in the two groups of cognitive style in which the field independent cognitive styles demonstrate learning outcomes of understanding physics concepts better than field-dependent cognitive style.

Results of univariate test results to learn the application of physics concepts, the F-count value obtained for 1.955 with P-value of 0.165. P-value> 0.05 indicates that the univariate, learning outcomes of understanding physics concepts in the field dependent group did not differ significantly by group of independent fields. The average value of a group of independent field higher than field-dependent group. So the results of this analysis there is no significant difference in learning outcomes of the application of physics concepts in both groups cognitive style.

Table. 11: Learning Outcomes Descriptive of Concept Comprehension and Physic Concept Application Learning Strategy Interaction with Cognitive Style

Learning Strategy	Cognitive Style	Average	Total	Deviation Std.	P-Value	P-Value
Concept Comprehension					**Multivariat**	**Univariat**
Expository	Dependent	4.847	29	1.926		
	Independent	5.943	29	1.333	0.592	0.517
STAD	Dependent	6.332	31	1.679		
	Independent	6.785	31	1.719		

Based on the table above, in the expository group, the average value of understanding the concept of field dependent physics group at 4.847 with a standard deviation of 1.926 and the average value of understanding the concept of independent fields of physics group at 5.943 with a standard deviation of 1.333. While the average value of the application of physics concepts field dependent group of 4.534 with a standard deviation of 2.044 and the average value of the group field application of physics concepts independent of 4.983 with a standard deviation of 2.015.

In STAD type group, the average value of understanding the concept of field dependent physics group at 6.332 with a standard deviation of 1.679 and the average value of understanding physics concepts independent fields of 6,785 groups with a standard deviation of 1.719. While the average value of the application of physics concepts field dependent group of 6.274 with a standard deviation of 2.171 and the average value of the group field application of physics concepts independent of 6.774 with a standard deviation of 1.632.

Multivariate testing, the F-count value of 0.528 with a P-value of 0.592. P-value> 0.05 indicates that there is no multivariate significant interaction effect between learning strategy and cognitive style on learning outcomes of understanding and application of physics concepts. Overall the combination of learning strategy and cognitive style did not show significant differences in learning outcomes of understanding and application of physics concepts. Univariate testing learning outcomes of understanding physics concepts, in the table above obtained value of F-count of 0.423 with P-value of 0.517. P-value> 0.05 indicates that the univariate, the interaction between learning strategy and cognitive style does not have a significant effect on learning outcomes of understanding physics concepts. So also with the results of the application of learning physics concepts, obtained F-count value of 0.366 with P-value of 0.547. P-value> 0.05 indicates that in the univariate, the interaction between learning strategy and cognitive style does not have a significant effect on learning outcomes of understanding physics concepts.

Conclusion

The average value of learning outcomes of understanding physics concepts showed a significant difference in the average value of the STAD group is higher than in the expository.

1. There are differences in the average scores of learning outcomes between students who have filed independent cognitive style with field dependent. Independent cognitive styles demonstrate learning outcomes of understanding physics concepts better than the dependent cognitive style.
2. There are differences in the average scores of learning outcomes between groups of applications of physics concepts students who have cognitive style field independent and dependent fields in physics. The average value of the group of independent higher than field-dependent group.
3. There is no interaction effect between learning strategy STAD type vs. expository and cognitive style on learning outcomes of understanding of the concept. In multivariate, F-count value of 0.528 with a P-value of 0.592. P-value> 0.05 are multivariate, there is no significant interaction effect between learning strategy and cognitive style on learning outcomes of the

application of physics concepts. In univariate learning outcomes of understanding physics concepts, the F-count value of 0.423 with a P-value of 0.517. P-value> 0.05 in univariate, the interaction between learning strategy and cognitive style does not have a significant effect on learning outcomes of understanding physics concepts.

4. There are differences in the average scores of learning outcomes between the application of physics concepts treated groups of students learning by using STAD type cooperative learning strategies with students who are given treatment expository learning in physics.

Suggestion

1. The average value of learning outcomes of understanding physics concepts showed a significant difference then STAD type cooperative learning should must often be done for other subjects.
2. There are differences in the average scores of learning outcomes between students who have field independent cognitive style and field dependent, should the teacher in implementing the learning should pay attention to students' cognitive styles possessed.
3. There is no interaction effect between learning strategy STAD type Vs expository and cognitive style on learning outcomes of understanding of the concept, the teacher is expected to be better in applying learning strategies.

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