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The Effect of STAD Cooperative Learning and Expository Method and Learning Independence on Educational Statistics Learning Outcomes

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Abstract
Educational Statistics course is a compulsory subject provided for Bachelor's degree students of Primary School Teacher Education major, Faculty of Teacher Training and Education Science in Open University Indonesia (S1 PGSD FKIP-UT), which implements a distance learning system. The concept of open education and distance learning system (PTJJ), in its implementation, is mostly completed not in the form of direct face-to-face class meetings, but in the form of a distance learning setting using communication facilities and tools such as printed documents, academic audio and video recordings, as well as radio and television broadcasts. Therefore, the research was aimed at determining to what extent the students' learning independence and STAD cooperative learning promoted during the tutorials affected their learning outcomes in the Educational Statistics course. The research was conducted in UPBJJ-UT Serang on a study group in Balaraja. The questionnaires were distributed to two tutorial classes; one tutorial class employed the STAD type of cooperative learning and the other employed the expository method. Their learning outcomes were then compared to answer the research problem using SPSS version 17.0 computer program. The obtained results of analyses showed that there were significant differences on the students' learning independence in those two groups. The students using STAD cooperative learning showed significantly higher rates of learning independence and learning outcomes than those who employed expository learning method.
Keywords: STAD, Expository, Educational Statistics, learning independence

Introduction

It is widely acknowledged that the rapid development of information and communication technology gave birth to a new paradigm in education. A type of teaching and learning process which has long been conducted in an enclosed dimension with the directly physical presence of the lecturer among the students begins to meet its challenger, which is a significantly different form of alternative classroom setting. The emergence of various media related to the development of information and communication technology enables the learning process to be conducted under an open system and long distance setting. This concept of open education and distance learning system (henceforth PTJJ), in its implementation, is mostly completed not in the form of conventional face-to-face class meetings, but in the form of distance communication teaching and learning settings between the teacher and the students through existing media such as printed documents, academic audio and video recordings, as well as radio and television broadcasts. The learning materials are designed and arranged in such a way that makes it easy for the students to learn independently. The separation of teacher and students, in its turn, provides opportunities for the students to actively participate in determining what to learn and how to learn it. The students are no longer dependent on the directions promoted by the teacher, instead they are required to have initiatives and creativities, be responsible for their learning actions, and be able to sustain their own learning strategies and styles under this distance learning education system.

The fact that there is a distance between the teacher and students then requires communication media and tools to connect them. With this respect, the presence of media therefore provides the possibility of a learning process in the PTJJ system of which success depends heavily on the characteristics of the media as well as the ability of the students. Thus, the characteristics of the students are integrated into one aspect that must be considered in the learning process; comprising the students' various age and abilities, distant residences, diverse cultural backgrounds, as well as different study time limits since most of the students of Open University (henceforth UT) already have jobs.

Independence is a requirement that must be owned by PTJJ students; however, the students' independent learning abilities are various which are caused by many factors. In general, the students of UT are not yet ready for the distance learning setting, so that their capacity of independent learning is mostly below the expected standard set by the university. UT students generally have the potential to learn independently, but they are unlikely to be prepared for full responsibility regarding their learning needs. In this regard, learning skills are essential for independent learning and also their attitudes and perceptions towards learning under various external influences play a role in constructing the students' readiness to embrace independent learning. In order to be a successful student in UT, it is inextricably important to have a high level of learning independence to understand the materials provided. Also, to be able to learn efficiently, the students must have self-discipline, take initiatives, take appropriate actions, and be responsible for the actions, be able to manage their time well to

study and stick to the schedule determined by the students themselves.

Learning in PTJJ is to be directed towards the provision of learning assistance (tutorial), either in the form of face-to-face or online meetings. In the tutorial process, the students are expected to be able to express and discuss any difficulties in understanding any concepts, foreign expressions, and exercises as well as points in the formative tests they have to the teacher of the subject. The teacher will then provide solutions to the students' problems and encourage the students to have a higher learning motivation. In this respect, the Educational Statistics course is one compulsory subject to be taught in face-to-face and online classroom tutorials to the S1 PGSD students of UT. Thus, the students can benefit from these opportunities well by asking the teacher about things that they do not understand until they get satisfied with the tutorial meetings.

STAD

The tutors have implemented various techniques and methods to assist their students; one of them is Student Teams-Achievement Division (henceforth STAD) cooperative learning method. By using this method, the teachers expect the students can benefit from this by being involved in the tutorial activities. The students will feel appreciated since the method requires the students to contribute individually and in groups. STAD is a cooperative learning method that covers the following basic principles: (1) every group member is responsible for any actions taken by their group; (2) every group member has to know all members of the group; (3) every group member has the same purposes to achieve; (4) every member of the group shares the same portion of tasks and responsibilities among them; (5) the contributions of every member of the group will be evaluated; (6) every member of the group shares a similar portion of leadership, which requires skills to learn together during the learning process; (7) every member of the group is required to be individually responsible for the material assigned to the cooperative group. Regarding the characteristics of cooperative learning, the points covered are: (1) all the students involved in the group cooperatively finish the learning materials based on the pre-determined basic competences; (2) the group consists of the students who have different skills and abilities, covering high, middle, and low achievers and, if possible, members of the group come from different races, cultures, ethnics, genders and other backgrounds; and (3) appreciation is directed towards the whole group, instead of individuals.

Expository

A teaching method which employs the provision of explanations, definitions, principles, and subject concepts in the first place as well as examples of problem solving techniques in the form of talks, demonstrations, questions and answers, and task assignments is called expository. In this model, the students mostly follow the learning process directed by the subject teacher thoroughly. The employment of this expository teaching model emphasizes on the direct delivery of the subject contents to the students. By using this method, the students do not need to search and find the subject facts, concepts, and principles as they are already selected and prepared by the tutor. Learning activities using the expository method tend to be centered on the tutor. The tutor actively provides detailed learning explanations and information about the subject content. In general, the tutor prefers to use the lecturing method combined with the questions and answers session. The lecturing method is widely preferred since it is easy to conduct with simple preparation, time and energy efficient, as with only one step the materials are delivered to all the students and can be completed inside the classroom. Popham & Baker (1992: 79) explain that every presentation of information delivered orally can be called a lecture. A formal lecture presentation usually lasts for 45 minutes while an informal lecture presentation lasts for 5 minutes. Lectures cannot be said to be good nor bad, but a lecture should be evaluated based on its purpose.

According to Hasibuan and Moedjiono (2000: 13), the lecture method is a way to deliver instructional materials using oral communication. It is said to be very effective and efficient to convey information and understanding. It is also a teaching method that uses verbal explanations. The kind of communication of this method is one-way and is often equipped with audio-visual aids, demonstrations, and questions and answers, brief discussions, and many others. Furthermore, Hasibuan and Moedjiono (2000: 13) suggest that, for a lecture to be effective, it is essential to follow the following steps: (a) formulating extended version of the specific instructional objectives, (b) identifying and understanding the students' characteristics, (c) arranging the lecture materials using advance organizers, (d) conveying the learning materials by giving brief discussions using a whiteboard, providing concrete examples and feedbacks, giving summaries at the end of every class meeting and discussion, (e) planning structurally programmed evaluations. In this case, the recitation method is used, which refers to a method of learning that which is widely known as homework, although this term is not entirely correct. Questions and answers method is in conjunction with the lecture method to stimulate the students' thinking activities and to determine the effectiveness of the teaching method. The application of questions and answers method by the tutor is to deal with the important points and issues that require special attentions.

During the teaching and learning process using the lecture method, it is essential to be sensitive to and focus on the students' responses. The relationship between stimulants and responses is not as simple as expected, but the stimulants given are determined to interact with each other, and this interaction is to influence the response

given resulting in various consequences that, in turn, will affect the students' behaviors. In attempt to promote the interactions to happen, attract the students' intentions and practice their learning skills, the lecture method is then usually combined with the questions and answers method and task assignment method. Further, Somantri (2001: 45) attempts to differentiate between the expository and lecture method. He suggests that in the expository method the tutor's domination in the classroom is much less. The tutor does not always keep talking and the information given only when considered necessary such as in the beginning of each lesson, explaining new concepts and principles, giving examples and field case studies, and others. The expository method is a way to express ideas or opinions while providing information both in oral and written forms. The expository method includes combinations of lecturing, drilling, questions and answers, discovery, and demonstration methods. However, any learning processes using the expository method still lend themselves to the tutor centered teaching and learning style. Compared to the lecture method, the expository method is no longer dominated by the tutor.

The tutor's activities of giving explanations in the expository method are only completed at a certain time such as in the beginning of every lesson, explaining subject materials, and giving examples of solving problems. The students' activities are not only limited to listening, taking notes, or paying attention, but also doing the exercises and during this activity the students may then discuss among themselves to answer the questions given in the practices; some may ask others how to answer them and some may be asked to come in front and write down their answers on the whiteboard. When the students do the exercises, the tutor may go around the class checking the student' work individually. If later it is considered that much of the students' work to be imperfect, then the activity is followed by classical explanations. The role of the tutor is as the 1) learning programmer developer, 2) source of correct information, 3) source of good facilities, 4) supervisor for the students in attempt to obtain the correct information, and 5) appraiser of the information delivery. Meanwhile, the role of the students are as 1) information seekers, 2) media users and the right sources, 3) the doer to complete the tasks given with the assessment from the tutors.

With regard to the above descriptions, the expository method used in this research covers the combination of the lecture, questions and answers, and task assignment methods. The tasks assigned by the tutor are in the form of exercises (homework) to be done individually and in groups. The learning points to be evaluated are the mastery level of the students' knowledge, skills and values. Generally, the assessment tools used to measure the students' learning outcomes are standardized tests or tutor-made tests.

Of the various factors associated with learning outcomes within the PTJJ system environment as described earlier, this research problem is limited to the learning independence, STAD cooperative learning, and expository method related to the students' learning outcomes. Therefore, the statement of the problems of this study is formulated as to identify to what extent learning independence, STAD cooperative learning and expository tutorials influence the learning outcomes of the S1 PGSD students of UT on Educational Statistics course. Thus, the purpose of this research is to identify (1) the students' learning independence, (2) the tutorial process which applies STAD cooperative learning in Educational Statistics course, (3) interaction rate of the students' learning independence using STAD, and (4) influence of learning independence and STAD cooperative learning on the students' learning outcomes.

II. Literature ReviewLearning and Learning Outcomes

The general understanding of learning as stated in an encyclopedia of education refers to the change in one's self, that is, a change of behavior through experience. The change takes place from the point before to the point after the learning actions and the change is not momentary or temporary but long-term or permanent. The intended change refers to the change in human disposition or capability that lasts a certain period of time and is not solely due to the growth process. The type of change called learning shows itself as a change of behavior, and inference about learning is drawn by comparing the behavior that may occur before the individual is set in the learning situation. Next, Bloom (2001: 2) classifies the learning outcomes into three domains: (1) Cognitive, covering goals related to thinking, knowing and solving problems; (2) Affective, including goals related to attitude, values, learning independence and appreciation; (3) Psychomotor, including goals related to skills. Capabilities and learning events indicate the presence of a set of fixed elements.

Basically, learning outcomes act as illustrations that show the level of student mastery of all the materials studied. In order to identify learning outcomes, it is required to conduct a measurement towards the learning efforts. According to Sudjana (1999) "learning outcomes are the abilities that a student possesses after he receives his learning experience". Measurement of learning outcomes can be done by providing assessments in the form of written tests, oral tests, and action tests with the appropriate measuring instruments of the learning outcomes derived from the formulation of the behaviors contained in instructional goals, and then the measurement results are shown in numerical value. Learning outcomes are the direct result of student behaviors after going through the teaching-learning process in accordance with the materials he learns, so that learning outcomes can be interpreted as the output of the teaching-learning process. Based on the understanding of learning results, it can be concluded that the learning outcome is not only something that can be measured

quantitatively but also qualitatively related to the change of the learners from “not able to do” to “able to do”, and the instrument of assessment used can take a form of a test or non-test.

Educational Statistics

Statistics a branch of science that studies data, that covers the collection, processing, analysis, interpretation, and conclusion drawing from the data in the form of numbers. Statistics is knowledge related to the ways to collect data, process and analyses it, as well as draw conclusions based on the data collection and completion of data analysis. Educational Statistics is a branch of science that discusses or studies and develops principles, methods used, in collecting, composing, presenting, analyzing materials in the form of numerical figures. Statistical data is a collection of information or facts that explain a problem.

Types of data according to their characteristics can be categorized as: (1) Qualitative data, i.e. data in the form of categories such as broken, good, happy, satisfied, succeeded, failed, etc.; and (2) Quantitative data, i.e. data in the form of numbers, such as 1m, 2m, 3 tables, 1 chair, etc. Moreover, based on the form of quantitative data, the categories include: (1) Discrete data, i.e. data obtained from a calculation, such as the number of college attendees today, the total number of visitors of a plaza, the number of occupants of the house no. 12, etc.; (2) Continuous data, i.e. data obtained from the measurement results, such as the distance between house A and campus B (in kilometers), crops yield of farmer A (in tons), student learning achievement B (GPA), employee C’s typing skill (words per minute), etc.

Based on the measurement scale, there are to categories of data: (1) Nominal, nominal data is a type of data resulted from a nominal scale and is a very simple data scale where the numbers listed are only for grouping or classifying. Variables (data of which value can change or not static) used in a nominal scale are called nominal variables; (2) Ordinal, ordinal data is a type of data obtained by categorizing, where the numbers listen also function as differentiators which show the order of levels based on certain pre-determined criteria.

The word “statistics” is different from the word “statistic”. Statistics refers to the branch of science that studies statistic. Statistics, in terminology terms, means to contain various kinds of understanding. Firstly, statistics can refer to statistical data. Secondly, statistics can also refer to statistical activities. Thirdly, statistics can refer to statistical methods which are certain ways that need to be taken in order to collect, arrange or organize, present, analyses, and provide interpretation of a collection of numerical information. Lastly, statistics can refer to the science discipline of statistics. “The purpose of descriptive statistics is to organize and summaries data so that the data are more readily comprehended”, this citation strongly suggests that statistics have a purpose to organize and summaries data so that the data obtained can be easier to understand.

Statistics can be divided into two types: descriptive statistics and inferential statistics. Descriptive statistics is a statistical method used to describe data that has been collected. Inferential statistics is a statistical method used to find something about the population based on the sample. Thus, statistic and statistics can be summed up as knowledge related to methods of collecting facts, summarizing, presenting, analyzing facts in the form of numbers and then drawing the correct conclusions from the facts analyzed.

The Role of Statistics in Educational Research

Statistics plays an important role in educational research because it can function as a tool in the process of data analysis obtained from the results of research conducted. The roles of statistics in educational research are as follows: (1) To provide information about the distribution characteristics of a particular population, either discrete or continuous; (2) To provide practical procedures in conducting survey for data collection through different sampling techniques. This is useful to obtain reliable measurement results; (3) To provide practical procedures for predicting the characteristics of a population through a sample characteristic approach, either through an appraisal method, hypothesis testing method, or variance analysis method. This is useful for knowing the size of concentration and size of dissemination as well as population differences and similarities; (4) To provide practical procedures for predicting the state of a particular object in the future based on the past and present circumstances through regression and time series method. This knowledge is useful to minimize the risk of future uncertainties; and (5) To provide practical procedures for testing qualitative data through non-parametric statistics.

Statistics may also function as: (1) A tool to calculate the size of the samples taken from a population so that the total number of samples needed will be more accountable ; (2) A tool to test the validity and reliability of research instruments before they are used in the research; (3) As a technique of data presentation so that the data are more communicative through tables, graphs, or diagrams; (4) As a tool to analyses data such as testing hypotheses proposed in the research study.

The Nature of Learning Independence

Independence is one dimension of someone’s character. Therefore, in studying the concept of independence, it is essential to see it as a part of human personality. Independence is one of the most important aspects of

personality that is fundamental to an individual. Everyone in this life has always experienced temptations and challenges. Individuals who have a high rate of independence are relatively able to deal with any kinds of life problems since independent individuals are not dependent on others. They always attempt to face the existing problems and solve them. Independence is defined as the development level of an individual, the ability to stand by his own feet, and rely on his own ability in performing various activities and solve all the problems encountered. Independence also refers to the state of a person being able to decide and do things without any help from others. From the above descriptions, it can be concluded that independence is the ability of an individual in realizing his will or desire in the real life without being dependent on others, such as being able to perform self-study, determine and conduct effective learning.

Learning is a word familiar to people in all levels of society, especially to students in every level of education. Moreover, the world "learning" has been an integral part of all their activities in pursuing education in formal education institutions. In learning, there are some main principles described as follow: (a) learning always brings about actual and potential changes; (b) the change is principally in the form of a new skill, (c) the change occurs due to the presence of effort. Thus, it can be said that learning is a process of change occurs within one's self who are intentional and directed towards a more intact and tough personality. In the education world, learning is a process undergone by a person from the "did not know" state to the "knew" state, from the state of "did not understand" to the state of "understood", and else. Therefore, learning is an element that is strongly related to independence; the kind of learning intended here is the independent learning skill, which enables the students to learn independently. Independent learning leads to the formation of self-independence in completing all kinds of learning activities. To sum, learning independence refers to the learning activities that are driven by the student' own willingness, choice, and responsibility without any assistance from other people as well as being accountable for what he is doing. UT students are then said to have a certain degree of independent learning if they are able to complete learning tasks without being dependent on other people.

Characteristics of Learning Independence

In order that the students are independent in learning, they are encouraged to have a certain degree of critical thinking, responsibility, hard-working, and are not easily affected by and dependent on other people. Characteristics of learning independence form the critical factors of forming the level of students' independent learning. The characteristics are classified into eight types, namely ability to (a) think critically, creatively, and innovatively; (b) not easily be influenced by the opinions of others; (c) not run away from or avoid problems; (d) solve problems by thinking deeply; (e) solve problems without any help from others when encountering them; (f) not feel inferior when being different from others; (g) attempt to work with perseverance and discipline; (h) be responsible for all the actions taken. With these regards, it can be concluded that the characteristics of every student's learning independence will appear if they have shown changes in their own learning. Students learn to be independently responsible for the tasks assigned to them and not dependent on other people.

Furthermore, there are two factors that influence the rate of learning independence of a student, namely endogenous and exogenous. The former refers to the factors that are contained within the student himself and the latter refers to the factors that exist outside the student's self. Endogenous factors cover all the influences that originate from within the student himself, such as his genetics, and body constitutions since birth with any features attached to the person himself. They are factors that are brought from birth that construct the basic provisions for his growth and development in life. Meanwhile, exogenous factors cover all other factors that come from outside the individual that are possible to affect his learning independence, such his family, neighborhood, classmates, school environment, lecturer, etc.

Also, according to the directions, the factors influencing a student's learning independence are distinguished as: (a) internal factors, or factors from the inside part of the student himself, such as age maturity and gender; and (b) external factors, factors from the outside part of the student, such as culture, modern society, and complexity of the modern life demands which tend to encourage much growth than that of the simple society life. With respect to the above descriptions, in achieving his high rate of independence, an individual cannot be separated from the factors that underlie the formation factors of independence itself. Those factors play a vital role in his future life and, in its turn, determine what and how the individual will behave and think independently in the future. The manifested students' self-learning independence relies heavily on the students to see, feel and perform the various learning activities in his daily neighborhood.

Personality and independence are two mutually determining and strengthening factors. Independence can also be expressed as self-reliance in taking actions, which can be seen and noted in the individual's way of decision-makings and provision of judgmental opinions. With the presence of self-reliance, the state of being independent is shown through the presence of initiatives and responsive actions to everything that arises spontaneously; as a reflection of the self-confidence of an independent person.

An individual who has a high level of independence also has a high level of creativity and motivation making him has the desire to compete or advancement for his own sake. He is also able to take decisions and

initiatives to solve problems encountered. It is also said that the individual also has a high level of confidence in completing his tasks and responsibility for any actions taken. Thus, based on the aforementioned descriptions, it can be concluded that the characteristics and features of independence can be seen from the individual's ability in: making decisions, giving judgmental opinions, taking initiatives, being confident in and responsible for taking actions.

Purnamasari (2014) suggests that the levels of learning independence of students who take parts in a Teams-Games-Tournament (TGT) type of cooperative learning are considered to be high. It was stated that the improvement of the students' reasoning and mathematical connecting ability in schools that promoted TGT was much better than the improvement of the students' reasoning and mathematical connecting ability in schools that employed direct-learning. There was no interaction correlation between TGT cooperative learning type and direct-learning model in improving the students' mathematical reasoning ability. However, there was an interaction correlation between TGT cooperative learning type and direct-learning model in improving the students' mathematical connecting ability.

Learning independence is one main variable in PTJJ system, which relies on self-directed learning and strongly demands independent attitudes. Independent learning situation requires independent attitudes which later become a state of independence. Next, it is essential to address the issue of learning independence as one fundamental element of every learning, which later promotes a quality improvement of a student since it strongly supports his initiative. Independent learning is a technique that requires students to learn by themselves with a limited support in understanding learning materials, completing learning activities, strengthening skills and implementing field experiences. Independent learning in many ways is determined by the ability to learn efficiently. Learning ability depends on the student's speed-reading ability and ability to comprehend the reading content. In understanding the learning materials, students can choose from many learning activities, some of them are studying the materials by themselves, in group discussions, or following the tutorials/lectures on__ broadcasting programs from UT, and having more learning sources from local libraries, local colleges or any other learning resources available nearby. To achieve the best possible learning outcomes, it is strongly suggested that students develop a learning schedule which has been adjusted to their daily activities and follow the schedule regularly.

Sitti Fitriana (2015) remarks that (1) most students already have self-efficacy in completing learning activities, learning independence, logical thinking ability and medium-capacity of mathematical ability, (2) variables that have significant influence on learning outcomes are self-efficacy, learning independence, and logical thinking ability. Learning activities have a direct influence on learning independence and logical thinking ability. Students' learning independence includes all activities completed consciously and intentionally to gain knowledge, attitudes, and skills without any coercions from anyone. The point of view of this concept is the self-initiated learning from students' internal awareness in determining how their learning is to be done. The concept of independence in learning includes intrinsic/internal motivation, which is the kind of motivation initiated and continued based on impulses that are related to learning activities. This means that the students are intrinsically motivated to have goals determined to succeed in the course subject they have.

In learning independence, there is a term called task-commitment (self-dedication to tasks) which encourages an individual to have perseverance and resilience, even when facing obstacles and difficulties, in doing and completing tasks that are under his responsibility by dedicating himself to the tasks on his own. To explain differences in students' independence characteristics, every student who has a high degree of task-commitment also has a high level of independence, initiatives, responsibilities and speed and accuracy in completing tasks. That is why students who have a high level of independence have a great opportunity to obtain great learning outcomes, while the students who have a low level of independence have a small opportunity to obtain great learning outcomes.

Student Teams-Achievement Division (STAD)

One of the approaches in cooperative learning that is simple and suitable for new tutors who begin to use cooperative learning method in the classroom is STAD; which is also an effective cooperative learning approach. There are five major components that characterize STAD, namely (a) class presentation, (b) group learning, (c) quiz, (d) development score, and (e) group reward. Besides, STAD consists of a regular cycle of teaching and learning activities.

The main purpose of this teaching method is that the tutor can present instructional materials as planned. At the beginning of all STAD type classes, the class is started with a class presentation. The presentation includes the opening, development, and guided exercises of the whole subject content for the day with the emphasis on the presentation of the subject matter. STAD type cooperative learning is developed by Robert Slavin and his friends at Johns Hopkin University (Slavin, 1995) as the simplest approach of cooperative learning and it is designed to suit new tutors who want to teach using cooperative learning method. The tutor starts by presenting the subject materials and followed by the students working in teams to ensure that all the team members have

mastered the points of the lesson. Finally, each of the students is asked to do a quiz with no help from anyone.

STAD type cooperative learning is an approach that emphasizes on both the students and tutor activities. Interactions between students are encouraged to occur to help each other when needed in mastering the subject materials as well as exchange and discuss ideas to achieve the learning objectives together. In this case, the tutor can explain the subject materials during class discussions so that the materials can be more easily understood.

To conclude, the five major components of STAD include: (a) Class presentation, which is the presentation of subject materials by the tutor in a classical style using verbal or written presentations. The presentation is focused on the concepts of the materials discussed. Then, after the materials are presented, the students work in groups or teams to complete the subject materials through tutorials, quizzes, or discussions; (b) Study group assignment. Group work is essential in STAD because within a group it is possible for cooperative learning to happen between the students to achieve optimal academic abilities. The main function of having group formations is to ensure that each group member can work together in the learning process and, more specifically, prepare every group member to be ready for individual tests. The group formation is based on the directions given by the tutor who is able to identify the characteristics of each student based on his previous learning outcomes; in this case the students fall into the category of high, medium, or low achievers. In every group, the tutor assigns high, medium and low achievers to form a group so that every group contains an equal number of students with various achievement levels. This is intended to avoid any conflicts that may occur within the group and between groups due to the unfairness portions of group members. The students are strictly not allowed to determine their own group and group members; (c) Tests and quizzes. the students are asked to do individual tests after several class presentations and after they have completed practices in their groups. In this regard, each of the students needs to be aware that their effort and success contribute substantially to the success of the whole group; (d) Individual improvement scoring. This scoring is useful to motivate all students to work hard and to get better results than the previous ones. Individual improvement scoring is calculated based on the basic score and test scores; (e) Group reward. This kind of group recognition is completed by rewarding the group efforts during the learning process. The group can be given certificates or other forms of reward when it achieves the predetermined criteria.

STAD Learning Implementation Stage

STAD type cooperative learning materials are designed in such a way to promote group learning. Before presenting the lesson materials, an activity sheet (discussion sheet) is distributed containing the list of subject materials to be learned by the cooperative learning groups that day and the students are asked to read it. The tutor then determines the number of groups and the group members in such a way that within one group the members are heterogeneous. Every group consists of four to five students who are high, medium and low achievers. In this stage, the tutor is the one to determine the group members and the students are not allowed to pick the members of their group since it is highly possible that they may choose only their own friends that they like.

Preliminary or basic scores of the students can be determined from the results of pre-test given by the tutor before the STAD cooperative learning class meeting and the students' final score can be determined from the students' results in the post-test. Besides, the preliminary scores can be determined from the students' report card from the previous semester. Next, student group work at the beginning of cooperative learning is suggested to be initiated with group work practices. This then becomes a good opportunity for every group member to do fun activities together and to know each other more. STAD activities consist of five main activities comprising subject materials delivery by the tutor, group work, quizzes or tests, group reward, and classroom periodic report.

According to Saeful Karim, et. al. (2012), the improvement of student achievement can be identified through the significance of the students' pre-rest score and post-test results using Wilcoxon test at 95% of significance level. In regard to this, it was reported that the improvement of the students' learning achievement using STAD cooperative learning method was as much as 74.4%. The improvement of students' cooperation could also be identified from the results of data observation when the STAD cooperative learning method was undergone. Further, from the research results, it was identified that the student cooperation level experienced an improvement in every meeting and at the medium level.

Every class meeting using STAD cooperative learning method begins with a class presentation, which includes introduction, development, practical guidance, group activities, and quiz. In every class presentation, things to consider are: 1) Introduction: (a) the tutor explains the materials to be studied, (b) tutor may instruct the students to work in groups to determine the learning concepts or to have a pleasure of group learning. 2) Development. (a) the tutor sets the goals to be achieved from the learning activities. (b) the tutor emphasizes the pre-determined learning point. (c) the tutor checks the students' understanding as often as possible through giving questions. (d) the tutor explains why the students' answers are right or wrong. (e) The tutor continues to next learning points when the students already understand the subject materials. 3) Controlled practices. (a) The tutor asks the students to give answers to the questions asked by the tutor. (b) The tutor calls students at random to answer questions or solve given problems. (c) The tutor does not necessarily provide questions that require

long answers and extended explanations in this phase of activity.

Before the STAD group work activities, the tutor should have explained the characteristics of working in groups, they are (a) every student must have a certain degree of responsibility to himself and the whole group; (b) no one is said to finish their learning before all the group members master all the lesson points set for that day; (c) they are required to ask for help from other group members before asking for help from the tutor; (d) they have to speak among group members politely and respectfully.

In answering questions, the students have to do them by themselves and match their answers with the other group members'. If there is a member who has not yet understood the materials, then his peers in the group are responsible for explaining the matter. Next, the tutor's main job is conducting supervisions to all the student groups. The tutor occasionally approaches the groups to see how the discussions in the groups are going. After making sure that all the groups have finished their discussions and confirm to all students whether they have all understood the subject materials, the tutor can then start a quiz. The suggested approximate time for the quiz is 60 minutes. The quiz results are then scored and contributed as group scores.

Group reward, 1) The tutor calculates individual scores and each group score as well as individual and group development scores based on the range of scores obtained by every individual. 2) The tutor gives appreciation to each group learning outcome, announce the individual and group development scores and mention the individual and group with the highest development scores and provide rewards to them in the form of certificates or compliments.

Regarding material presentation in STAD, there are things to consider: (a) Introduction, in this section, it is necessary to emphasize the learning objectives that need to be achieved in group work and inform other important things to motivate students' curiosity about the concept to be learned. The subject materials are presented by the tutor and the students follow the presentation carefully in preparation for the next quiz or test. (b) Development, the materials are explained in compliance with the materials learned in groups. In this phase, the students learn to understand meanings instead of just superficial memorizing. The kind of questions asked in this phase is the true or false question type. (c) Controlled practices, controlled practices are done by presenting the materials by asking the students to do exercises, calling students at random to check answers and solve problems. The kind of questions is suggested to be not time-consuming so that the students can be ready when being selected to check their answers. (d) Group work, the tutor distributes workbooks to all the students in groups and the subject material contents of the workbook are suitable to support cooperative learning method. The tutor provides help by providing assistance through clarifying instructions, repeating concepts, and answering questions. In every group activity, all the students discuss the problems encountered, compare answers, or correct misconceptions. the groups are expected to cooperate, work together and help each other understand the learning materials. (e) Evaluation, the tutor conduct evaluation that lasts for 60 minutes to show what the students have learned and completed in the group work. After the class presentations by the tutor and group work by the students, the students are given 60 minutes to do an individual test. In answering the test, the students are not allowed to help each other. The results of the test are then considered as evaluation materials, which later will be used as individual development scores and contributing to the group development scores.

Expository

Expository is a learning strategy that emphasizes on the process of material delivery using verbal communication from a tutor to students with the underlying intention that the students can optimally master the subject materials; this is also known as direct-instruction learning strategy. The students using this type of strategy are not required to investigate the materials themselves. Due to the fact that expository method emphasizes more on the lecture process, this method is also known as the "chalk and talk" method. Expository is classified as a form of tutor-oriented learning or teacher-centered method (Wina Sanjaya, 2008: 179). The tutor plays a vital role in delivering the materials in a structural manner with the expectation that the subject materials can be mastered well by the students. The main focus of this method is the students' academic achievement.

The principle of expository learning method which has to be concerned by the tutor is the delivery of subject materials, but it does not mean that the process of delivering the materials is without any learning purpose. In fact, it has to be the main priority of using this type of learning method. The learning process is said to be a communicative process, referring to the process of delivering messages from one person to another person or a group of people. The messages delivered are in the form of subject materials which has been arranged in such a way to achieve specific purposes. In the communication process, the tutor serves as the sender of the messages and the students serve as the recipients of the messages. The tutor has to place the students in a certain condition that require them to be ready both physically and psychologically to receive the lesson. Expository learning is also expected to encourage the students to learn more about the subject matter.

According to Wina Sanjaya (2008), the preparation stage means preparing students to receive the lesson materials. The success rate of expository learning depends heavily on the (1) preparatory steps, inviting students to get out of the passive mental state; (2) raise of students' motivation and interest to study; (3) use of

stimulation and curiosity to students; (4) creation of an open learning atmosphere and climate. One point in the presentation stage which needs to be concerned by the tutor is how the course materials can easily be understood by the students.

Next, drawing conclusion is the last stage in understanding the core of the subject matter presented. Through the conclusion stage, the students are expected to be able to take the essence of the presentation process. This step is considered to be very important in the expository learning method because in this stage the tutor can collect information about the students' mastery level on the subject materials taught.

III. Research MethodsLearning Scenario

Out of two tutorial classes with the total number of 60 students enrolling Educational Statistics course in Balaraja learning group, UPBJJ-UT Serang, the students are divided into two groups with the following learning activities.

No.	Tutorial Activities in the Expository Class	Tutorial Activities in the STAD Class
1.	Meeting 1:Classroom tutorial with Expository method	Meeting 1:Classroom tutorial with STAD cooperative learning approach
2.	Meeting 2:Continuing with the steps of Expository method	Meeting 2:Continuing with the steps of STAD approach in small groups
3.	Meeting 3:Task I tutorial using Expository method	Meeting 3:Task I tutorial using STAD method individually
4.	Meeting 4:Material explanations using Expository method	Meeting 4:Group work assignment using STAD method in study groups
5.	fMeeting 5:Task II tutorial using Expository method	Meeting 5:Task II tutorial using STAD method individually
6.	Meeting 6:Material explanations using Expository method by discussing the module materials	Meeting 6:Group discussions with the module materials as the discussion contents
7.	Meeting 7:Task III tutorial using Expository method	Meeting 7:Task III tutorial using STAD method individually
8.	Meeting 8:Explaining the Final Exam and discussing materials that have not been mastered by the students. Then, the students are given a post-test	Meeting 8:Summarizing of the discussion results and explaining the Final Exam as well as discussing materials that have not been mastered by the students. Then, the students are given a post-test

This research on the influence of STAD cooperative learning approach and Expository method implementations as well as the students' learning independence to their learning outcomes in the Educational Statistics course was completed in compliance with the instructional tools such as the course tutorial/lesson plans and Open University Tutorial Unit.

The population and sample of this research study consisted of the two classes of S1 PGSD students of UPBJJ-UT Serang who took the Educational Statistics course at the 2016 registration time. One class studied the course using STAD cooperative learning approach, while the other studied the course using Expository method. The students' learning independence was also observed. In order to identify the students' learning outcomes, their test results of the tutorial tasks given were used. The _difference test of the treatment results was completed using multivariate analysis of covariance (MANCOVA) technique, with two covariates namely pre-test and evaluation, with two factors namely STAD cooperative learning and Expository method, and two dependent variables. With using SPSS 17.0 software programmer, the significance level (sig.) = 5% or α=0.05 (Winarsunu, 2007: 99-100). MANCOVA is a statistical technique different from analysis of covariance (ANCOVA). When we want to compare two or more groups with two or more dependent variable, then multivariate analysis of variance (MANOVA) is used. Then, when a covariate is added to MANOVA, so it becomes multivariate analysis of covariance (MANCOVA).

According to Agus Widaryono (2010: 211), multivariate significance test is to determine any centroid difference between two or more groups and can be evaluated using statistical tests, namely: (1) PIllai's; (2) Hotelling's Trace; (3) Wilks' Lambda; (4) Roy's Largest Root. _The statistical test formula can then be written as follows.

Pillai's Trace = $\sum_{i=1}^{k} \frac{\lambda_i}{1+\lambda_i}$; Hotelling's Trace = $\sum_{i=1}^{k} \lambda_i$

Wilk's Lambda = $\prod_{i=1}^{k} \frac{1}{1+\lambda_i}$; Roy's Largest root = $\frac{\lambda_{max}}{1+\lambda_{max}}$

where is λ eigenvalue and k is the total number of eigenvalue

IV. Findings and Discussion

At the beginning, the students were somewhat confused when learning using STAD cooperative learning approach, especially the students who have been used to learning independently looked a bit clumsy when asked to work and discuss in groups. However, as the time went by, the students got accustomed to hanging out and they were willing to work in groups and discuss the exercises in the workbook and other group tasks. Students could also take parts in the group work, as the group leader, group secretary, and members which were all determined in their own group. In general, the group leader was chosen by all the group members and he or she was usually the oldest person in the group, while the secretary was usually the youngest person in the group who was quite active and agile so that the atmosphere of the group dynamics was quite impressive. The group leaders were able to nurture the other group members well and the group members obeyed what the group leader asked them to do.

The Educational Statistics is a compulsory course subject that must be taken by the S1 PGSD students as basic knowledge to other courses and one pre-requisite subject for taking Professional Ability Establishment course in the eighth semester. The students are expected to master the statistical data processing system in the school where they teach for the benefit of their school database and the classes that they teach. The statistics course is one of the courses that is quite difficult to learn, but if the students are diligent and attentive in the classroom when the tutor explains the course materials, then it is easy for them to do the tutorial tasks given and even the Final Exam. By experiencing first-hand the implementation of STAD cooperative learning in tutorial activities, the students can pass the Final Exam of the semester easily with good grades. This is mainly because in the STAD cooperative learning class, the tutor provides a lot of exercises about Educational Statistics along with the completion steps, so that the students can understand the course materials easily. The steps of implementing STAD are more often about the discussions of answering exercises and the completion steps, which in turn make learning easier. Meanwhile, as the students learn using expository method, the students spend more time on listening to the Educational Statistics lectures and there are only limited opportunities to do exercises and get explanations from the tutor on how to do them. The students only get limited opportunities to explore themselves in studying the Educational Statistics course, such that there is no room for independent learning to grow and develop. In other words, the activities included in the STAD cooperative learning strongly promote learning independence and are said to excel those included in the Expository method.

The application of STAD cooperative learning type lends itself to the orientation on the skill-building processes, which can improve the students' understanding in Physics major overall. The average students' score was reported to be much higher when the STAD cooperative learning approach was applied and the process skill-oriented was emphasized. According to Yelli Oktavien et. al. (2012), learning using Jigsaw model of cooperative learning could better improve the students' ability to solve mathematical problems of senior high school students than using conventional learning method.

Furthermore, Nugroho U. (2009) states that in STAD cooperative learning which emphasizes on the process skill, the teacher has to explain the work steps so that the students know exactly what to do, and the teacher needs to guide the students during the learning process, and the students can ask the tutor when they meet any difficulties. The STAD cooperative learning type, which emphasizes on the process-skill, is then said to be effective in improving the students' learning activities.

V. Conclusions and SuggestionsConclusions

The conclusions of this research are:

1. There was a significant difference between the students who studied using STAD cooperative learning and those using Expository method in term of their level of learning independence. The students of STAD cooperative learning class are more independent than those of the Expository method class.
2. There was an interaction between the students who experience the STAD cooperative learning and the students who learn using Expository method to their learning outcomes. The students who learned using STAD had better learning outcomes than those using Expository method.
3. There was an interaction between the students who experience the STAD cooperative learning and the students who learn using Expository method as well as their learning independence to the learning outcomes in the Educational Statistics course. The students who learned using STAD had higher rates of learning independence and better learning outcomes than those using Expository method.

Suggestions

To researchers who want to conduct research on the application of STAD cooperative learning approach in Open University tutorials, it is suggested that the students' motivation to be included as another variable to consider in addition to their learning independence.

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