Improving student learning activities through tournament team’s games on engineering mechanics subjects

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Abstract. Lack of variation in implementing learning method makes students do not participate actively and are bored within teaching and learning process, thus there should be a new teaching model that is intended to improve students’ active participation. This research investigated on how carefully cooperative learning model by applying Teams Games Tournament, which is to find out whether the model can improve students’ level of activity in mechanical technique subject of modelling and information design department in SMKN 1 Sumedang. The research was classroom action research conducted in two cycles. Furthermore, observation report, students’ active participation, field notes and tests as the instruments. The sample of this study was thirty five of tenth grade of DPIB 4 students who were taking mechanical technique class. The findings revealed that there is a significant improvement in students’ active participation and students’ learning outcomes. The writer saw that if students are engaged in the teaching and learning process, there will be an improvement in their learning outcomes. In addition, students’ level of activity improves in the following aspects: visual activities, oral activities, listening activities, writing activities, motor activities, mental activities, and emotional activities. The study concludes that cooperative learning model, by applying TGT model, can be recommended as one of alternative learning models which can improve students’ level of activity and students’ learning outcomes.

1. Introduction

Less varied learning methods applied during the learning process make students give responses that tend to be passive. Student negative responses include there are students who fall asleep and feel bored while studying which makes them passive in following the teaching and learning process. Passive attitudes of students in their learning process will affect their learning outcomes. Related to efforts to overcome boredom and the passivity of students in learning by the lecture method and as an effort increase the activeness and student learning outcomes, the researcher will apply model cooperative learning in teaching and learning.

There are many kinds of cooperative learning models available, including Jigsaw, Teams Games Tournament, Numbers Head Together, Student Team Achievement Diviation there is [1]. In this study, researchers will apply cooperative learning models Teams Games Tournament type in the teaching and learning process. Selection of learning models Teams Games Tournament (TGT) cooperative type is based on ad because in its implementation the class is divided into small groups with different levels of ability, then students will work together and discuss in small groups in solve the given problem. In
addition, students are also required to compete with another group to get a score for the team. This is expected to improve the activeness of students who are required to discuss with each other and to be brave to advance challenges to other teams to scramble to answer the questions correctly. Otherwise, it is expected to make students more relaxed, grow responsibility, be able to work together, and can compete fairly.

2. Methods
This type of research is Classroom Action Research. Classroom Research is an examination of learning activities in the form of actions that are intentionally raised and occur in a class together. Classroom action research can be interpreted as a teacher's effort to improve and improve the quality of student learning in the classroom. Subjects in this research are a class X DPIB 4 student of SMK Negeri 1 Sumedang, amounting to 35 people and consists of 31 male students and 4 female students.

Sources of data that researchers get obtained through observation sheets and test results of learning. Observation sheet contains notes on the student's effectiveness during learning and test results. Learning outcomes are obtained from written tests in the form of questions done at the end of each cycle. The data analysis technique used is the quantitative analysis technique used for now the increase in activeness and student learning outcomes with percentage analysis. Data analyzed are the activeness of student learning and student learning outcomes.

2.1. Student learning activeness
To analyze Teams Games Tournament learning data between cycles and comparing the results, the researcher uses the percentage formula as used by Anas Sudijono, the formula is as follows [2]:

- Find the percentage of each indicator by the formula:
  \[
  \text{Percentage of each indicator} = \frac{\text{score of each indicator}}{\sum \text{total student}}
  \]

- Find the percentage of student activity in one class:
  \[
  \text{Percentage of class activity} = \frac{\text{score of each indicator}}{\sum \text{indicator} \times \sum \text{total student}}
  \]

The criterion for the success of this research is if after the implementation of the Teams Games Tournament method can increase positive student activities more than 75% a decrease negative student activities.

| Percentage | Categories |
|------------|------------|
| 75%-100%   | High       |
| 51%-74%    | Medium     |
| 25%-50%    | Low        |
| 0%-24%     | Very Low   |

2.2. Student learning outcomes
Student learning outcomes are analyzed by calculating individual completeness and classical completeness with the following formula [3]:

- Individual completeness
  \[
  \text{Individu completeness} = \frac{\text{score obtained}}{\text{total score}}
  \]

The results obtained are then compared with the Minimum Graduation Criteria. The minimum completeness of knowledge learning outcomes is 80. If the individual value is less than 80 means students...
have not yet completed and if the value obtained is equal or more than 80 means students can be declared complete.

- Classical completeness

\[ \text{Individu completeness} = \frac{\sum \text{student who are complete}}{\sum \text{total student}} \]

Classical completeness description is done by comparing the results obtained. If the number of students completing is equal or more than 80%, it means classically learning is said to be complete and vice versa.

3. Results and discussion

The results of conducting classroom action research are divided into two major parts, namely results in cycle I and results in cycle II. The results will be described in the first cycle and second cycle includes planning, implementation, observation and reflection.

3.1. Result

Planning begins with the researcher preparing the learning tools and instruments research includes lesson plans, teaching materials, questions and answer keys, student activity observation sheets, participant chest number, division of student groups, and prepare rewards. Action implementation class on Cycle I is held on Monday 15 April 2019 and Cycle 2 on 22 April 2019 starting at the 4th hour until with the 6th hour with 33 students attending. In practice researchers acted as a teacher with the assistance of 3 observers, the PPL teacher who taught Mechanical Mechanics at SMK Negeri 1 Sumedang.

Based on observations of student activeness data it is known that positive student activity is 40% in cycle 1 and 78.63% in cycle 2 and negative student activity is 16% in cycle 1 and 12% in cycle 2. In Cycle 1, positive activity students do not meet the criteria while the negative activity of students is expected to decrease in cycle II. Positive student activity has not been fulfilled because students do not really understand the learning process with using the Teams Games Tournament cooperative learning model. In Cycle 2, students have understood the learning process by using the Teams Games Tournament cooperative learning model so it can increase positive activity and decrease negative activity.

3.2. Discussion

3.2.1. Discussion of student learning activity. Student learning activeness includes visual activities, oral activities, listening activities, writing activities, motor activities, mental activities, and emotional activities. Visual activity is an activity or student behavior involves the eye as an organ that works. Student visual activeness is divided into two aspects that are positive and negative activeness. The results of observations of students' positive visual activeness showed an increase in student activeness when paying attention in class. This activity is an adjustment to the characteristics of active learning which is the emphasis of exploration values and attitudes regarding subject matter [4]. While the negative visual activeness of students when using a cell phone and paying attention to students who are walking outside the classroom actually increases because when calculating the questions, they use cellphone calculators and at the time of the study there were other activities outside the classroom disturb attention.

Students' speaking activeness is divided into two aspects, namely positive activeness and activeness negative. Speaking is a form of speech act in the form of sounds produced by the instrument said [5]. The activity of positive speaking students is done by observing students in activities students ask questions about the material, answer questions, and submit opinion. The results of observations of students' speaking activeness showed an increase in student activeness who dares to ask other students or teachers if they don't understand the problem confronted him [6]. The activeness of students' negative speech is seen from the activities of students who are chatting, singing, screaming during the learning
process. The speaking force negative students show a decrease in their percentage from cycle I to cycle II.

Listening is the most important skill needed for completing work at work [7]. In this research place the intended work is the school as a place for students to study. Active listening The observed activities are students listening to the teacher delivering the material, listening answer teammates, and listen to answers from other teams during the tournament take place. The results of observations of positive listening activity showed an increase in numbers the presentation. The negative learning activeness that researchers observe is when students listen to music through a cellphone and when hearing other friends tell stories during the teaching and learning process take place. The activeness of students’ negative hearing shows a decrease in conscious presentation cycle I to cycle II.

Writing can be defined as an activity of delivering messages (communication) with using written language as a media tool. At first glance, the same writing activities with speaking activities, namely to convey information to others [8]. Active writing positive students seen from student activities when taking notes and working the questions given by the teacher. The results of observing the activity of positive writing showed an increase in the percentage figures, this increase shows that the application of the learning model cooperative Teams Games Tournament (TGT) type in the learning process successfully improves the activity of writing positive students. The activeness of students’ negative writing can be seen from the current student activities drawing and scribbling on tables during the learning process. Liveliness Student negative writing shows a decrease in percentage in other words that negative activity of students has decreased from cycle I to cycle II.

Student’s mental activity can be seen in terms of students participating in carrying out the task learning, students are involved in problem solving, students ask other students or teachers if they do not understand the problems they face and students carry out group discussions according to the teacher's instructions [6]. The results of observation of mental activity shows an increase in the percentage rates because students have responded to the material delivered by teachers, dare to express opinions, able to work together to solve problems with his team, and remember the material delivered by the teacher. Negative mental activity students viewed from the activities of students while joking so as to obtain a low score. Liveliness negative mental students show a good change because the percentage rates increasingly decreased from cycle I to cycle II.

Emotional comes from the word emotion. Emotions can also arise when a change occurs on every event that concerns us [9]. Positive emotional activity observed from the students’ graceless activities when their opinions were not accepted, when they had to be patient waiting for their turn, and when students tolerate when their team scores are reduced and or taken by another team. The results of observations of positive emotional activity showed an increase in the percentage figure. Negative emotional activity of students is seen from student activities when angry when his opinion is rejected, sleepy when the teacher presents the material, sleepy when playing take place, chin each other when the teacher presents the material or during the game. These negative activities are a form of deviation from various emotional activities. Activities include interest, feeling bored, excited, excited, passionate, brave, calm, and nervous [10]. The negative emotional activeness of students from cycle I to cycle II shows a decrease in the percentage rate. Decreased percentage of activity negative emotional students occur because students have understood the flow of the game implementation.

Positive motoric activity can be seen from the activities of students in bold activities to be developed team representatives and gather with each team. This activity is an adjustment with active learning characteristics that faster feedback will occur on learning process so that it can be said of student movement activities is a response towards the learning process [4]. Response is a reaction carried out someone to the stimulus or behavior that is presented by the stimulus [11]. The results of observations of active activity showed a positive increase in the percentage rate. The activeness of negative moves of students is seen from the activities of students when disturbing other students, running around during the game, and leaving the classroom without permission. Active activity is negative has decreased because students have increasingly understood the rules of the game tournament.
3.2.2. Discussion of student learning outcomes. In addition to student learning activities, the application of the Teams cooperative learning model Games Tournament (TGT) can also improve student learning outcomes. The following data is the results of learning Class X DPIB 4 students on the competencies of the stresses that occur in the beam with using the Teams Games Tournament (TGT) type of cooperative learning model.

Improved learning outcomes are in accordance with the main objectives of the application of learning models cooperative which is creating pro-academic norms among students, and pro-academic norms have a very important influence on student achievement [12]. One of the students' achievements in this study was the increase in learning outcomes. Besides in general, there have been achieved a number of cooperative learning models, specifically this research has achieved the goal of applying the Teams Games cooperative learning model Tournament (TGT) is to provide benefits for students who work together to complete academic assignments, providing opportunities for learners from various fields background and conditions, to work and depend on each other for shared tasks and teaches students the skills of collaboration and collaboration between groups [13].

Improved learning outcomes occur after applying the type of cooperative learning model Teams Games Tournament. This is in line with research conducted by Mijil Ari Setiawan regarding the Application of Teams Games Tournament (TGT) Learning Method for Improving the Strength and Learning Outcomes of Measuring Instrument Competencies in the Expertise Program Light Vehicle Engineering SMK Negeri 1 Sedayu Bantul. The results showed that The introduction of the Teams Games Tournament Learning Method (TGT) can increase activity and student learning outcomes in class XI TKR B SMK Negeri 1 Sedayu Academic Year 2016/2017 which amounted to 32 students [14]. This is also supported by classroom action research conducted by Shinta Arwidya who concluded that the application of the learning model Cooperative Type Team Games Tournament (TGT) can increase activity and learning outcomes XI IPS 3 students of SMA N 3 Boyolali on the subjects of sociology [15] and research Diah Megasari Tyasning, et al. who concluded that the research on the Implementation of the TGT Learning Model (Teams Games Tournaments) Equipped with LKS to Increase Activities and Learning Outcomes Petroleum material can improve learning outcomes in Class X-4 High School Batik 1 students Surakarta 2011/2012 Academic Year [16].

4. Conclusion
Based on the results of research conducted in class X DPIB 4 SMK Negeri 1 Sumedang during the teaching and learning process of Mechanical Mechanics Subjects on competence the stresses that occur in the beam can be concluded as follows:

- The implementation of the Teams Games Tournament (TGT) type of cooperative learning model can be increase the activeness of students' positive learning on the competencies of the stressors occur in the beam and has reduced the level of negative activity of students while learning.
- The application of cooperative learning model type Teams Game Tournament (TGT) can improve student learning outcomes.

Teams Games Tournament (TGT) type of cooperative learning model can be made an alternative learning model to improve student activity and learning outcomes.

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