Student Team Achievement Divisions: Its Effect on Electrical Motor Installation Knowledge Competence

Ahmad Hanafi*, Ismet Basuki
Graduate Program, Universitas Negeri Surabaya. Indonesia.

*ahmadhanafi@mhs.unesa.ac.id

Abstract. Student team achievement division (STAD) was an active learning strategy with the small group inside of the classroom members. The students would work in small heterogeneous groups (of five to six members) and help one another to comprehend the material given. To achieve the objectives of the study, this research aims to know the effect of STAD on competence of electrical motor installation. The objective of the student competence was knowledge competence. The data was collected from 30 students. the participants were the students of second class at electrical installation techniques, SMKN 1 Pungging Indonesia. The design of empirical test in this research was one shot case study. The result of knowledge test would be compared by criteria for minimum competence, which was 75. Knowledge competence was analyzed with one sample t test technique. From the analysis got average 84.93, which meant average of student competence had reached criteria for minimum competence. From that analyze, It could be concluded that STAD was effective on electrical motor installation knowledge competence. STAD could grow student motivation to learn better than other models. But, in the application of cooperative learning teacher should prepare carefully before the learning process to avoid problems that could arise during group learning such as students who were less active in the groups. The problem could be resolved by away the teachers took around to check each group. It was felt could minimize the problems.

Keyword: effectiveness, criteria for minimum competence, knowledge competence.

1. Introduction
Depend on the opening of Indonesian Republic 1945 Constitution was declared that one of the purposes is educate national life. Because of that every Indonesian people are entitled to earn a good education quality as conformity with the interestedness and galantines without regardless of social, racial, ethnic, religious, and gender status. To realize the purpose of national education, so it is established a standard of graduation competence. Based on Article 35 of Constitution Number 20 Year 2003, it is structured graduate ability that includes attitude, knowledge, and skill of students that must be fulfilled or achieved from an educational unit at the level of education at the level of education. Based on the Curriculum of 2013 emphasizes the four aspects of the competence of learners that include: spiritual attitudes, social attitudes, knowledge and skills that reflect the behaviour and mindset of learners. On the implementation of the 2013 curriculum of the learning process that is cantered on the learners, so that the role of educators in this curriculum is only as a facilitator in the learning process. Grouping students to work together becomes more and more acceptable to be applied by teachers. Students have a degree of potential, historical background, as well as future expectations are different. Because of the differences, Students can educate cooperative learning is consciously creating successive loving each other interactions so learning resources for students not only teachers and textbooks but also fellow students. So on the learning process; teacher is only as a facilitator.
STAD was developed by Robert Slavin et al from University of John Hopskin. This method is the simplest cooperative learning method. Educators use cooperative learning as a teaching method in all grade levels, in all curriculum areas, and for many different purposes, but all uses centred on the goal of getting students to understand and learn the material presented. Interest in cooperative learning gathered momentum in the early 1980s with the publication of the first meta-analysis involving 122 studies on the effects of cooperative, competitive, and individualistic goal structures on students’ achievement and productivity in a sample of North American schools [4]. The results showed that cooperation was more effective than interpersonal competition and individualistic efforts; cooperation with intergroup competition was also superior to interpersonal competition and individualistic efforts; and there were no significant differences between interpersonal competitive and individualistic efforts. Moreover, these results were consistent across all subject areas (language arts, reading, mathematics, science, social studies and physical education), for all age groups, and for all tasks involving conceptual understanding, problem solving, categorizing, and reasoning. Cooperative learning on Felder & Brent (2004) explained that cooperative learning is a subset of collaborative learning in which students work in teams on structured learning tasks under conditions that meet five criteria. 1) Positive interdependence, Team members must rely on one another to accomplish goal. 2) Individual accountability, members held accountable for doing their share of the work and mastering all material. 3) Face-to-face interaction, some or all work done by members working together. 4) Appropriate use of interpersonal skills. 5) Team members practice and receive instruction in leadership, decision-making, communication, and conflict management.

Regular self-assessment of group functioning. Teams periodically reflect on what they are doing well as a team, what they could improve, and what (if anything) they will do differently in the future. Cooperative learning is not students sitting around a table studying together and group projects with one or two students doing all the work. Cooperative learning is a cooperative effort where interest and involvement can be generated, where all members are given tasks to work as a team. In cooperative learning, it involves small group of students (usually five to six members) of the different ability level working as a group for interaction to occur [9]. The effectiveness of cooperative learning principles and techniques in building a motivating, supportive learning environment is well known [6]. Cooperative learning is seen beneficial especially in a diverse classroom environment where students differ from religion, culture, race, etc. [2]. The main idea in all the cooperative learning approaches is that students work and learn together actively in small groups to accomplish a common goal in a mutually helpful manner. Cooperative learning is necessary in any teaching-learning situation, because this particular strategy “can foster educational excellence for all children regardless of race, class, or gender, and can provide students and teachers with the experience and expectations of active participation in controlling and changing the spheres of their lives” [12]. So the researcher can argue that the Cooperative learning is a student-centered, instructor-facilitated instructional strategy in which a small team of students is responsible for its own learning and the learning of all team members. This way of grouping is believed to motivate the members of each group to get high scores.

Student Team Achievement Division (STAD) is a cooperative-learning strategy in which small groups of learners with different levels of ability work together to accomplish a shared learning goal [7]. The teacher presents a lesson, and then students work together within their teams to make sure that all team members have mastered the lesson. Finally, all students take individual quizzes on the material, at which time they may not help one another. Students’ quiz scores are compared to their own past averages, and points are awarded on the basis of the degree to which students meet or exceed their own earlier performance [11]. STAD is considered a good strategy because as one the cooperative learning techniques, it can raise students’ motivation in learning by exchanging and sharing information, reinforcing each other, giving feedback and having the responsibility for their tasks in group work [3]. STAD is one of the techniques of cooperative learning in which students are divided into groups of 4-5 members. Based on this technique, the teacher presents the lesson and then gives the students in each group a test based on the content of the instruction. The average of the students’ score in each group is the score of STAD group. Accordingly, the STAD groups will be classified to good team, great team, and super team with respect to their scores achieved at the end of each session [12]. In STAD, learners work in small heterogeneous groups (of five to six members) and
help one another to comprehend the given material. Individual quizzes are given at the end of the week and the best group is rewarded on the basis of individual improvement. The reward is given in different forms; their names may be written on the bulletin board or they may be given certificates at the end of every week [4]. The steps of STAD as type of cooperative learning as follows 1) Establish a group whose members are 4-6 people in a heterogeneous; 2) The teacher presents a lesson; 3) The teacher gives the task to the group to be done by members of the group. The members know to explain to other members until all members of the group understand; 4) The teacher gives a quiz/questions to all students at the time of answering the quiz should not help each other; 5) Provide evaluation; 6) Conclusion.

Based on the above descriptions can be concluded that Student Team Achievement Division is an active learning strategy with the small group inside of the classroom members. The students will be work in small heterogeneous groups (of five to six members) and help one another to comprehend the given material. To achieve the objectives of the study following null hypotheses were tested using a STAD; the average of student competence can reach above criteria for minimum competence.

2. Method
The design of empirical test in this research is one shot case study. The design of the empirical test design is shown in the following picture.

![Diagram]

Where:
X: Experimental treatment (use of STAD)
O: Post test score of knowledge competence

3. Respondent
The participating in this research is selected use simple random sampling technique. So the participating are the students of second class at electrical installation techniques. SMKN 1 Pungging Indonesia. There are 30 students. The research will be done at the second semester of school year 2016/2017.

4. Result
There are two kinds of analysis on this research. They are using descriptive analysis and using one simple t test. From the descriptive analysis, it can be known that N=30 with minimum score is 76 and maximum score is 96. Electrical motor installation average (mean) is 84.933 with standard deviation is 7.25370. Variance value is 52.616. Skewness value is .259 and kurtosis value is -1.303.

Before competence’s score is analyzed using one simple t test. This research has assuming that “by applying STAD, students can reach knowledge competence. The research result will be analyzed using a statistically test. That is one sample t test. Before using statistically test, the data must complete a requirement test. The requirement test is distributed normality using Komogorov Smirnov test. That is because the result is a single data. The result of distribution normality analyzed using IBM SPSS Statistics software. The result of distribution normality distribution normality with N=30 get value z = .152 and significance .076. From those description can be concluded for accepted H0. Which means data is distributed normally. Because the distribution data is normal, so data can be analyzed using one sample t test. The test will be analyzed using IBM SPSS Statistics software. Before data that is analyzed using one sample t test. This research has statistical hypothesis 1) H0: < 75 (students result average of knowledge competence by applying STAD less than 75) and 2) H1: ≥ 75 (students result average of knowledge competence by applying STAD more or equal than 75). From that hypothesis we can make a conclusion for a result. The result of one sample t test is shown in the following table.
Table 1. Result of One Sample T Test

| Test Value | t | df | Sig. (2-tailed) | Mean Difference |
|------------|---|----|-----------------|-----------------|
| 75         | 7,501 | 29 | 0.000 | 9.93333 |

Depend on that Table 1, one sample t test get the significance .000. There is a different between average of electrical motor installation competence result (84.9333) and criteria of minimum competence (75). It means the average of student competence has reached criteria for minimum competence.

5. Conclusion

Base on the analysis. It can be known that the average of student commence has reached minimum competence criteria. So, It can be concluded that STAD is effective on electrical motor installation knowledge competence.

5.1. Recommendation

Teachers are encouraged to cooperative learning for some topic in teaching an electrical problem solving. However, the learning process has to be prepared as good as possible in advance. It is to avoid problems in the learning using STAD or another strategy. Test the effectiveness of the other cooperative learning strategies in teaching electrical or other related subject. But, In the application of cooperative learning should the teacher should prepare carefully before the learning process. This is to avoid problems that can arise during group learning such as students who are less active in groups or others.

REFERENCES

[1] Felder, R. M., & Brent 2004 Cooperative learning. National Effective Teaching Institute.
[2] Glomo, D. T. & Norzales 2015 Student team achievement divisions (STAD): Its effect on the academic performance of EFL learners. American Research Journal of English and Literature. 1-2378-9026.
[3] Hanum, L 2015 A teacher’s experience in teaching with student team-achievement divisions (STAD) technique. Intern. J. of Inst. 8(2)
[4] Ishiaq, M., Ali, Z., & Salem. M. 2013 The effects of student teams achievement division (STAD) on motivation of Saudi EFL adult learners. Intern. J. of Lang. Ed. and App. Ling.(IJLEAL).
[5] Johnson, D. W., Maruyama. G., Johnson. R., & Nelson. D., 1981 Effects of cooperative, competitive, and individualistic goal structures on achievement: A metaanalysis. Psychological Bulletin, 89, pp. 47-62.
[6] Kupezynski, L., Mundy, M. A., Goswami. J., & Meling, V. 2012 Cooperative learning in distance learning: A mixed methods study. Intern. J. of Inst.. pp.1308-1470.
[7] Majoka, M. I., Dad, M. H., & Mahmood, T. 2010 Student team achievement divisions (STAD) as an active learning stratagy: Empirical evidence from mathematics classroom. J. of Ed. and Soc.. 2078-032X.
[8] National Ministry of Education. 2003 National system education. Jakarta.
[9] Ocampo, R. O., & Ocampo, R. B. 2015 Effectitiveness of students’ team achievement division on students’ attitude toward physics. Asia Pacific Journal of Multidisciplinary Research. 3(4). Pp. 112-117.
[10] Republic of Indonesia 1945 Constitution of Indonesian Republic 1945. Jakarta
[11] Saniei, A. (2015). The contribution of student teams-achievement divisions (STAD) to teaching English collocations to intermediate learners. Intern. J.of Lang. Learning and App. Ling. World (IJLLALW). pp. 2289-3245.
[12] Tiantong, M., & Teemuansai, S. 2013. Student Team Achievement Divisions (STAD) technique through the moodle to enhance learning achievement. Canadian Center of Science and Education
[13] Wyk, M. M. 2013. The effects of the STAD-cooperative learning method on student achievement, attitude and motivation in economics education. J Soc Sci.pp. 261-270.