Comparison of the Contextual Teaching Learning (CTL) Model and Student Team Achievement Division (STAD) on Student Achievement at Electrical Engineering Course Subject

Anggy Pradiftha Junfithrana(✉)

Departement of Electrical Enginering, Nusa Putra University, Sukabumi, Indonesia
mr.pradiftha@nusaputra.ac.id

Abstract. This study aims to determine how big the difference between the use of the Contextual Teaching and Learning (CTL) learning model and the Student Team Achievement Division (STAD) type of cooperative learning model by comparing the learning outcomes of students at level XI of the Audio Video Engineering Expertise Program at SMKN 1 Sukabumi on a basic competition. Mastering the Audio Aircraft System for the Academic Year of 2008–2009. This research was conducted using an experimental method. With a sample of two classes, each class has 30 people. In class AV2 using the STAD learning model (control class) and in class XI AV3 using the CTL learning method (experimental class). The data collection tool is a learning achievement test in the form of multiple choice as many as 20 items given to students at the beginning and end of the study. The results showed that there was a significant difference in the average learning outcomes between the CTL and STAD learning models. The average gain for the STAD class is 0.47 and for the CTL class 0.64. Based on the analysis of the research data by performing normality, homogeneity, and t-tests, the gain data for the STAD class was obtained with (☐2)count = 4.262 and for the CTL class obtained (☐2)count = 6.204, at the 95% confidence level (☐2)table = 7,815, so the gain data is declared normal with (☐2)count < (☐2)table. Obtained Fcount = 1.05 and Ftablel = 1.892 so that the gain data is declared homogeneous with Fcount < Ftable. From the t-test, obtained t-count of 5.08. At dk = = n1 + n2 -2 and for the 95% confidence level, we get table (97.5%) (58) of 2,011. So there are differences in learning outcomes with tcount > ttable (97.5%) (58). Based on these results, it can be concluded that the Contextual Teaching and Learning (CTL) learning model is better than the Student Team Leadership Division (STAD) cooperative learning model in improving student learning outcomes.

Keywords: Student Team Achievement Division (STAD) · Contextual Teaching and Learning (CTL) · Teaching

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1 Introduction

In the world of education there are many paradigms of learning that teachers might apply to the learning process. Individual and group teaching methodologies can be used to categorize learning paradigms. For instance, the cooperative learning models of Student Team Leadership Division (STAD) and Contextual Teaching and Learning (CTL).

Research conducted at SMKN 1 Sukabumi found that the the actual learning process is still instructor-centered, which means that the teacher still acts as a transferor of subject matter, as a result students become less active, because they only receive material verbally and have an impact on students' ability to master subject matter that is not optimal.

Based on the problems that occur, the application of the CTL and STAD models is expected to improve the performance of student learning outcomes.

2 Research Methods

According to Wina Sanjaya contextual teaching and learning (CTL) is a learning strategy that places an emphasis on the process of full student involvement to be able to locate the material being studied and relate it to real-world situations in order to encourage students to be able to apply it in their lives [1].

Learning that places an emphasis on the context or connection between the subject matter and actual experiences is known as contextual teaching and learning (CTL). CTL urges educators to create a learning environment where students are active participants rather than passive observers.

CTL has 7 main constructivism, inquiry, questioning, and learning communities are some of the components, modeling, reflection and evaluation in the real world. These elements are used in the Contextual Teaching and Learning (CTL) learning phases, which are broken down into various stages, including [10]:

1. Contact Phase At this stage, issues
2. Curiosity Phase At this stage, questions are asked that can invite students' curiosity and curiosity.
3. Developing Stage until the questions from the curiosity stage can be resolved, exploration, concept formation, and concept consolidation are carried out during this stage.
4. Nexus (Nexus Phase). At this stage, exploration, formation and consolidation of concepts are carried out to questions at the curiosity stage
5. Evaluation Phase Phase): An overall learning evaluation is conducted at this point which is useful for assessing student learning success.

Hilda Karli argues that: Cooperative learning or cooperative learning is an attitude or habit that involves two or more people working together to support one another in an organized framework of cooperation in groups, with the success of the activity being greatly influenced by each person's participation in the group [2]. According to Anita Lie, "The philosophy that underlies the cooperative learning model is the philosophy of homo homini socius [3, 7]. The characteristics of cooperative learning are as follows:

1. Team learning.

2. Based on cooperative management.
3. Willingness to cooperate.
4. Skills to work together.

3 Method

The experimental approach is the one employed. According to Nana Sudjana the experimental method is "a method that reveals the relationship between two or more variables and looks for the effect of one variable on another variable [4]. Moh. Nazir, argues that "experiment is an observation in controlled artificial circumstances, where these circumstances are produced and managed by the researcher [5, 9].

The Control Group Pretest-Posttest Design was the methodology employed in this investigation. Where in this design the experimental and control groups were given a pretest before the treatment was given to the experimental class for a certain time, after which the dependent variable was measured for both groups (Table 1).

Explanation.

E: Experimental treatment class (CTL learning model).

K: Control treatment class (STAD learning model) Y_1: Pretest (Pretest).

X_1 Experimental class treatment is given with CTL learning model.

X_2 The control treatment is given by using the STAD learning model.

Y2 Final test (Posttest).

Table 1. Research design

Class	pre test	Independent variable	related variable
E	Y1	X1	Y2
K	Y1	X2	Y2

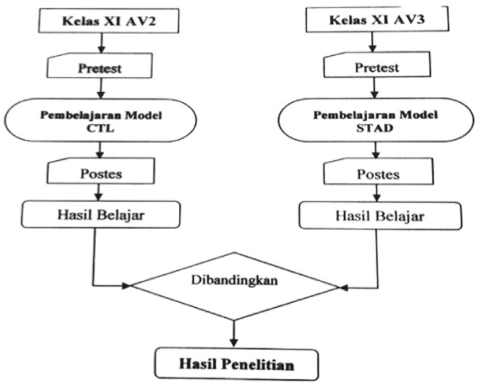

Fig. 1. Ressearch Framework

Data collection of this study is Literature study, carried out to obtain information by utilizing literature relevant to this research, namely by reading, studying, studying, citing opinions from various sources in the form of books, dictates, thesis, internet, newspapers, and other sources (Fig. 1).

Test, which is a set of tests, exercises, or other instruments used to gauge a person's or group's knowledge, abilities, skills, or capabilities.

Documentation Study, is used to obtain information or data related to the research problem. Direct observation method, which is a data collection technique by conducting direct observations of the object under study. Observations were made by the author at SMKN 1 Sukabumi.

4 *R*esult and Discussion

This research instrument trial was conducted on students of the XI AV1 class XI AV1 audio video engineering expertise program as many as 27 respondents outside the research sample. Meanwhile, the type of test instrument used is an objective test (multiple choice) with a total of 30 items with 5 options.

Sugiyono states that "An instrument is said to be valid, if the instrument can be used to measure what is to be measured" [6]. A good instrument will produce correct data and quality research. The calculation of the Using the PeaRSon Product Moment correlation calculation, the validity of the research tool was evaluated. Based on computations' outcomes with the help of the Microsoft Excel 2007 program, the results obtained from 30 test items for learning outcomes to install an audio video system obtained 22 valid item items (item numbers: 1, 2, 3, 5, 6, 7, 8, 9, 11, 12, 13, 15, 16, 17, 19, 21 22, 23, 24, 27, 28, 29) and 8 are invalid (item number: 4, 10, 14, 18, 20, 25, 26, 30), with a 95% confidence level (Table 2).

4.1 Research Instrument Reliability Test

The results of the reliability test on the research instrument on a sample of 25 students with a level of freedom (dk) n-2 and a significance level of 5%, it is obtained that itabel is (0.396). Meanwhile, the calculation results show rcount ($_1$1) of (0.79). Based on the results of the reliability test calculation, it can be said that the research instrument is declared reliable, where $r_1$1 (0.79) > Itabel (0.396) (Table 3 and 4).

4.2 Result

Based on the results of the analysis of pretest, posttest and gain data for the experimental class (CTL) and control class (STAD) using manual calculations and with the help of MS Excel 2007, the following findings were obtained:

The average value of the pretest experimental class (CTL) and control class (STAD) were 47 and 48.5, respectively. The data for the pretest scores of the two classes were normally distributed and homogeneous (having the same variance). Then, a t-test was carried out to determine the similarity of the two averages to the pretest value. The result is a tcount value of -0.76. If the value of tcount is compared with the table at a

Table 2. Instrument Validation Test Results

Number of Question Items	Value Of tcount	Interpretation	Description
1	3,366	Valid	Instrumen Valid, If: thitung > ttabel (1,71)
2	2,432	Valid	
3	2,769	Valid	
4	0,096	Not Valid	
5	3,634	Valid	
6	2,343	Valid	
7	2,995	Valid	
8	3,707	Valid	
9	3,163	Valid	
10	1,520	Not Valid	
11	2,720	Valid	
12	3,760	Valid	
13	2,195	Valid	
14	0,575	Not Valid	
15	2,692	Valid	
16	1,963	Valid	
17	2,370	Valid	
18	0,986	Not Valid	
19	1,761	Valid	
20	0,883	Not Valid	
21	1,778	Valid	
22	2,955	Valid	
23	2,398	Valid	
24	1,778	Valid	
25	0,010	Not Valid	
26	1,268	Not Valid	
27	3,932	Valid	
28	2,035	Valid	
29	3,148	Valid	
30	0,667	Not Valid	

significant level of 5% (0.05) and degrees of freedom/dk 58, then the obtained tcount < ttable (0.975)(58)(2.011). The decision taken is that Ho is accepted, meaning that there is no difference in students' initial abilities between the experimental class (CTL) and the control class (STAD).

Table 3. Difficulty Level Test Results

Interpret ation	Amountof Question Items	NumberofQuestion Items
Easy	6	2,5,7,9,12,17
Medium	17	1,3,6,10,11,13,15,19,20,2 1,22,23,24,26,27,29,30
Hard	7	4,8,14,16,18,25,28

Table 4. Difficulty Level Test Results

Interpretation	Amount of Question Items	Number of Question Items
Good	6	1,3,6,10,11,12,22,23,27
Enough	17	2,5,7,8,9,13,14,16,17,2 4,28,29
Bad	7	4,15,18,19,20,21,25,26, 30

After the learning process is carried out and by treating the CTL learning model and STAD learning model learning. The final ability of the two groups experienced differences, the average posttest from the experimental class (CTL) was 73.83 and the control class (STAD) was 79.93. Next, a t-test was conducted to determine the average difference to the posttest value. The result is that tcount is 2.77 and ttable (97.5%) (58) is 2.011. If the value of tcount is compared with ttable at a significant level of 5% (0.05) and degrees of freedom/dk = 58, then tcount > ttable (0.975)(58)(2.011).

The average gain (increase) by class, the experimental class (CTL) is 0.64 and the control class (STAD) is 0.47. From the gain data analysis using the t test, it is obtained that tcount is 5.08 while the ttable value (97.5%) (58) is 2.011. If the value of tcount is compared with ttable at a significant level of 5% (0.05) and degrees of freedom/dk = 58, then tcount > ttable (0.975)(58)(2.011).

Based on the findings of the research above, the following is a description of the discussion of the research results intended to obtain an overview and clarity of the results obtained as a way to draw conclusions:

1. The application of the CTL learning model in class XI AV3 turns out to have an effect on student learning outcomes. The ability of students has increased. This can be seen from the students' posttest scores which show a greater average when compared to the pretest scores. The dominant factors that influence the improvement of student learning outcomes include:
   a) The high enthusiasm of students towards the learning model provided. This is because students are bored with the learning model that is commonly used, so that the application of a new learning model can stimulate enthusiasm and motivate students in learning.

b) The characteristics of the CTL learning model are unique. Among them have the main concept of connecting the material being studied with real life. So that students do not easily forget the material that has just been learned because students construct the knowledge gained to be able to relate it to real life and apply it
c) The occurrence of an active teaching and learning interaction pattern among students, so it is not monotonous from teacher to student. This can be seen from the involvement of students in providing opinions from their experiences as material for discussion in learning activities. Students are more open to problems and difficulties

2. The application of the STAD type of cooperative learning model in class XI AV2 turned out to have an effect on student learning outcomes. The ability of students has increased. This can be seen from the students' posttest scores which show a greater average when compared to the pretest scores. One of the dominant factors that influence the improvement of student learning outcomes include:
   a) The existence of group activities that provide a concept of healthy competition between groups in an effort to gain recognition from other groups. That way students really want to master the material with the motivation to want to advance their group.
   b) The awkward feeling to ask the teacher about material that is not well understood can be overcome by having a group. Students who do not master the material will easily get an explanation from their group friends, because they enthusiastically teach each other so that their group friends can master the material.
   c) Comparison of learning outcomes between the application of the CTL learning model and the STAD learning model shows a significant difference, this is caused by different learning characteristics. That is, the CTL learning model is more constructivist and the STAD learning model is more cooperative. In this study, the CTL learning model showed better results than the STAD learning model. This is of course due to the advantages and disadvantages of each learning model.

5 Conclusion

Student learning outcomes using the Contextual Teaching and Learning (CTL) learning model increased by 0.64 from the ideal score. This can be seen from the average pretest score of 47 and the posttest average value of 79.93 from the ideal score. Based on the classification of student learning success rates, it can be categorized as high. b. Student learning outcomes using the Student Team Achievement Divisions (STAD) cooperative learning model increased by 0.47 from the ideal score. This can be seen from the average pretest score of 48.50 and the posttest average value of 73.83 from the ideal score. Based on the classification of student learning success rates, it can be categorized as high.

Based on the increase in abilities that have been achieved by the class that uses the Contextual Teaching and Learning (CTL) learning model and the class that uses the Student Team Achievement Divisions (STAD) cooperative learning model, it can be said that there is a significant difference in improvement between the two classes. Where the Contextual Teaching and Learning CTL class has increased by 0.64 and the Student Team Achievement Divisions (STAD) class has increased by 0.47. Based on these results, it can be concluded that the use of the Contextual Teaching and Learning

CTL learning model in this study is better than the use of the Student Team Achievement Divisions (STAD) cooperative learning model.

References

1. W. Sanjaya, Strategi Pembelajaran; Berorientasi Standar Proses Pendidikan. Jakarta: Kencana Prenada Media Group, 2008.
2. H. Karli and S. Y. Margaretha, "Implementasi kurikulum berbasis kompetensi," Bandung Bina Media Inf., 2002.
3. A. Lie, "Cooperative Learning (revisi)." Jakarta: Grasindo, 2003.
4. N. Sudjana, "Dasar-dasar dan Proses belajar mengajar," Bandung Sinar Baru, 1989.
5. M. Nazir, MetodePenelitian. Jakarta: Ghalia Indonesia, 1988.
6. P. D. Sugiyono, "Metode penelitian pendidikan pendekatan kuantitatif," Kualitatif dan R&D, 2001.
7. Nasution S., (1995), Didaktik Asas-Asas Mengajar., Jakarta : Bumi Aksara.
8. Nazir, Mohamad. (1999). Metode Penelitian. Jakarta : Gahlia Indonesia.
9. Pahmi, Aji W (2002). Pengoperasian Perangkat Audio dan Radio. Armiko:
10. Bandung. Purwanto, Ngalim. (2004). Prinsip- Prinsip dan Teknik Evaluasi Pengajaran. Bandung: PT Remaja Rosda Karya.