

Comparative Study of Cooperative Learning STAD And TGT Types Using Interactive Learning Methods in The Pandemic Covid-19 Situation at Mutiara Bangsa-2 National Plus School

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ABSTRACT

Research on the comparative study of cooperative learning types STAD and TGT has been successfully carried out, which aims to determine the effect of learning science using STAD and TGT methods on student learning outcomes in cognitive and affective aspects, the influence of high and low scientific literacy abilities of students on learning outcomes in cognitive and affective elements, and the interaction between STAD and TGT learning methods with scientific literacy skills on student learning outcomes in cognitive and affective aspects. This study used an experimental approach with a 2x2 factorial research design. The sampling technique used random cluster sampling, with the research sample being class 7A and 7C. Data collection was carried out using test and non-test techniques. Test techniques are used for cognitive learning outcomes and scientific literacy skills, while non-test techniques are used for effective learning outcomes. The data analysis technique was two-way ANOVA. Based on the results of the research obtained, it was found that there was an influence of the STAD and TGT type learning methods on student cognitive learning outcomes, and there was no influence of STAD and TGT learning methods on student effective learning outcomes, there was an effect of students' scientific literacy abilities on student cognitive and affective learning outcomes. And there is no interaction between STAD and TGT types of learning methods with scientific literacy skills on learning outcomes in cognitive and affective aspects of students.

Keywords: STAD, TGT, Scientific literacy, Learning outcome

INTRODUCTION

In around December 2019, the world was faced with an epidemic caused by a new virus and made millions of victims die. The virus that we know today as the Covid-19 virus has the most common symptoms such as fever, dry cough, and fatigue, which over time, if not treated properly, these symptoms will become more serious such as shortness of breath, pain in the surroundings. Chest and the loss of the ability to speak and lead to death [1],[2]. On average, symptoms will appear 5 to 6 days after a person is first infected with the virus, but it can also be around 14 days after that.

One month later, on January 24, 2020, 830 new cases were diagnosed in nine countries: Japan, South Korea, Singapore, Thailand, Vietnam, Nepal, America, Taiwan, and China. At least 26 deaths occurred mainly in patients with severe congenital diseases, and it seems that a growing number of cases are due to

human interactions [3]. Starting from a local issue in Wuhan, the virus spreads to most parts of the world, including Indonesia, by transmission, called local transmission between residents. In another opinion, L. Morawska calls it airborne transmission [4].

The emergence of Covid-19 has changed the life order of almost all countries in various sectors. Starting from the economy, food security, employment, and so on, Indonesia is no exception. The World Bank estimates that economic growth in Indonesia in 2020 will only be at a percentage of 2.1% due to the spread of Covid-19, which continues to spread both domestically and abroad. Bank Indonesia (BI) has also revised Indonesia's economic growth balance below 5% or only around 2.5% [5]. The economic shock has led some experts to the view that Indonesia must enter into a recession.

The education sector has also been greatly affected by the emergence of this virus. So as a

first step to reduce the rate of spread of the virus, many countries have carried out online learning or also lockdowns, and schools or universities have been closed for several months until now, as can be seen in Figure 1. below:

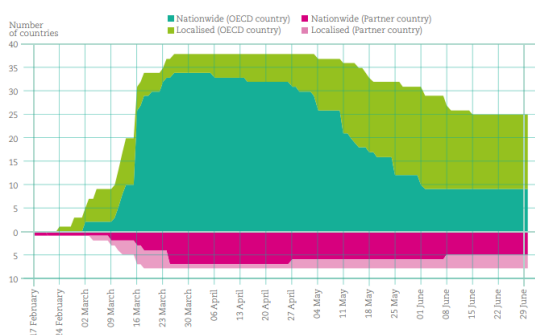


Figure 1. Countries that are closing schools due to the Covid-19[6]

The unpreparedness of all parties in education is a crucial obstacle with the change in teaching and learning from face-to-face learning (larynx) to online, which requires all parties' readiness starting from parents, students, teachers, schools, and the government. It cannot be denied that the government has relaxed the education assessment system, which is adapted to emergencies on the condition that it still adheres to the rules so that learning can still be carried out without burdening students in achieving competence. This situation certainly requires teachers to be more creative in applying appropriate learning methods and models not to bore students during an unpredictable pandemic like today.

Interactive learning methods by utilizing technology are indeed essential to apply, in addition to the fact that technological literacy should be mastered by all elements of education because there are so many learning resources that can be used by both teachers and students in the teaching and learning process, one of which is the Nearpod platform. Nearpod is a learning platform based on the cloud, which allows teachers to make presentations that are fun and easy to learn [7], [8]. Students can view

presentations with any device together with the teacher, and interactions are possible during teaching and learning activities taking place in Nearpod, as shown in Figure 2. below:

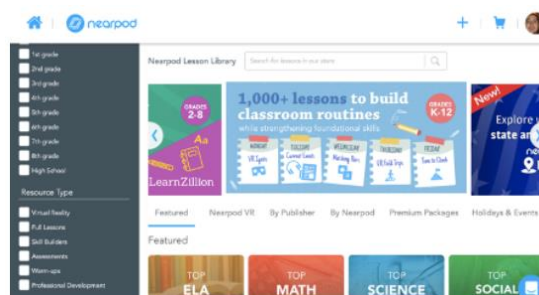


Figure 2. User Interface Nearpod's platform

The Cooperative Learning learning model is considered entirely appropriate to be applied in a pandemic situation like this because it has several advantages such for example, students who work together with each other also tend to understand each other, improve their communication skills, and make their self-esteem increase when their work is valued by them. Co-workers [9]. The Cooperative Learning learning model positively impacts students' cognitive abilities and cooperation between group members.

One suitable and most frequently used cooperative learning model is STAD (Students Teams Achievement Divisions). The STAD steps described by Rusman are: 1) learning motivation goals to be achieved; 2) the groups were divided heterogeneously; 3) presentation or presentation from the teacher; 4) teamwork; 5) quiz; 6) awards for the team [10]. Another cooperative learning model that is similar to STAD is the TGT (Teams Games Tournament). The slight difference between the two lies in the steps of the game. Suppose the STAD type is done by giving individual in-group members quizzes, then in the TGT type. It is done by providing a numbered card to the team, then students play educational games together with other team members and compete to contribute points to the team. In the TGT type, teammates will help each other and make thorough

preparations for the game by studying the activity sheets and discussing them together. However, when the game is in progress, group mates are not allowed to help, and here individual responsibility is prioritized in the game [11].

From some of the descriptions above, the expected goal of this study is to prove or test the significant difference in the effect of the application of the STAD and TGT learning models in the teaching and learning process on students' cognitive and affective learning outcomes and whether there is an influence between scientific literacy on outcomes. Cognitive and affective learning of students and whether there is an interaction between cooperative learning models type STAD and TGT with scientific literacy on student cognitive and affective learning outcomes.

RESEARCH METHODS

The research was conducted in grades 7A and 7C of the Mutiara Bangsa-2 National plus School first semester in the academic years of 2020/2021. The design used in this research is the Nonequivalent Control Group Design. Using this research design is because the groups in the experimental class and the control class were not randomly selected. In practice, the practical and control classes get the same material, namely "Forces and Their Effect" in the book *Amazing Science 7th grade* by Darren Forbes et al., Published by Oxford University Press [12]. The sampling technique used cluster random sampling technique, and the data collection technique was carried out using test techniques for cognitive learning outcomes and scientific literacy, as well as non-test techniques (questionnaires) for effective learning outcomes. Before the research was carried out, the prerequisite of the instrument was tested, namely its validity and reliability, first. Especially for non-test devices, the validity of the expert test construct was also carried out before trying the validity and reliability.

Hypothesis testing was carried out using the

post-test mean difference test with the independence of the sample t-test. The data analysis technique used the independence test sample t-test if the other prerequisite tests such as the normality and homogeneity tests had been met. In this study, the normality test was carried out using the Liliefors method. In contrast, the homogeneity test used the Bartlett method with the Chi-square statistical test as in Suardana's study [13]. The research method used is an experimental method with a 2x2 factorial design. The research design can be seen in Table 1. below:

Table 1. The 2x2 factorial research design

	Scientific Literacy (B)	
	High (B ₁)	
	Low (B ₂)	
STAD (A ₁)	A ₁ B ₁	A ₁ B ₂
TGT (A ₂)	A ₂ B ₁	A ₂ B ₂

with :

- A₁ : STAD learning method
- A₂ : TGT learning method
- B₁ : High scientific literation
- B₂ : Low scientific literation

RESULTS AND DISCUSSION

The results and discussion were first started by analyzing the students 'initial conditions in the two experimental classes based on the students' cognitive scores on the daily tests of the material "Forces and Their Effects." This analysis aims to determine the research sample's initial conditions, which include the mean similarity test, normality test, and homogeneity test [14].

Table 2. The results of the average similarity test for students' initial conditions

df	t _{table}	t _{cal}	Description
19	2.093	-1.082	H ₀ Accepted

Based on the average similarity test results

in Table 2, the t count is -0.184. the amount of t_{count} is outside the critical area range of $t_{-(1-\alpha/2)} < t < t_{(1-\alpha/2)} = -2.093 < -1.082 < 2.093$, so that H_0 is acceptable. From these calculations, it is concluded that the initial state of class 7A and 7C have the same initial ability. The analysis of the normality test using the Liliefors method in Table 3 indicates that the initial conditions of the two groups are the same and normally distributed. While the results of the homogeneity test analysis are shown in the Table. 4. is intended to show that the sample owned is homogeneous, which is used with the Bartlett test at the 0.05 significance level.

Table 3. The results of the normality test of the student's initial state

Methods	L Result		Description
	L_{table}	L_{hitung}	
STAD	0.195	0.126	Normal
TGT	0.195	0.173	Normal

Tabel 4. The results of the homogeneity test of the student's initial state

Learning outcomes	χ^2 Result		Description
	χ^2_{table}	χ^2_{cal}	
Daily test result	3.841	0.046	Homogen

Comparing the value of cognitive, affective, and scientific literacy learning outcomes of the two classes after being given treatment can be seen in Figure 3. a), b), and c) below.

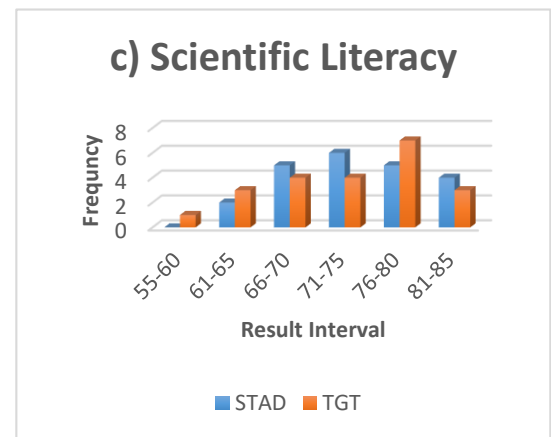
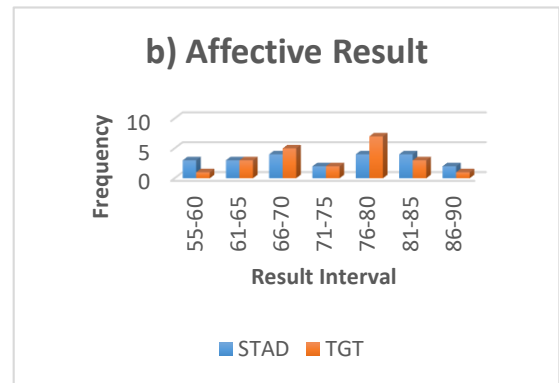
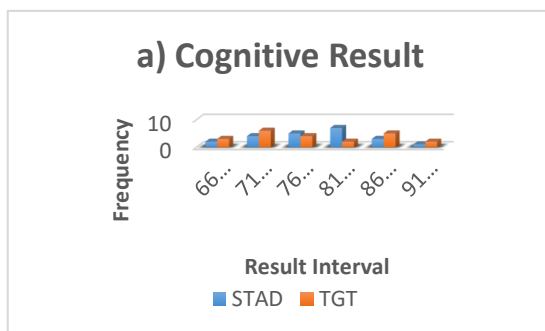


Figure 3. Histograms of learning outcomes a) cognitive aspects of students, b). affective elements of students and c) students' scientific literacy

Then, for the final stage analysis of the cognitive aspects of students, the results can be seen in Table 5. below:

Table 5. The results of the F test for cognitive aspects of students

F_{table}	F_{cal}	Description
	5.78	H_{0a} Rejected
3.62	4.12	H_{0b} Rejected
	2.92	H_{1ab} Rejected

Because of F_{cal} , (5.78) > F_{table} (3.62), then H_{0a} is rejected, and H_{1a} is accepted. Thus, there is an influence between the learning model of experimental class I and practical class II on the learning outcomes of students' cognitive aspects. Because F_b count (4.12) > F_{table}

(3.62), then H_{0b} is rejected and H_{1b} is accepted; thus, it can be said that there is an influence between scientific literacy on student learning outcomes in cognitive aspects. Because $F_{cal} (2.92) < F_{table} (3.62)$, then H_{0ab} is accepted and H_{1ab} is rejected; thus, it can be said that there is no interaction between STAD and TGT learning methods with scientific literacy on student learning outcomes in cognitive aspects.

The results of the two-way ANOVA calculation on the cognitive aspects of the two methods show that there is an influence between the experimental class I (STAD) and practical class II (TGT) learning models on students' cognitive learning achievement in the material "Forces and Their Effects." Furthermore, based on Table 6., the average mental aspects of students' learning outcomes using the STAD method (82.76) were smaller than the TGT method (86.48), so the TGT method gave higher results STAD method on this material. The difference in results can be strengthened by explaining that there are fundamental differences between the two methods in the learning process, especially in group discussions. The class group that uses the TGT method seems to enjoy the learning process more because the TGT method is a learning method that uses game techniques.

This in itself will train students to understand better the material being studied. Besides that, in the game, all team members have an equally important role in trying their best to understand the material and answering the questions correctly, so it will appear that students are very enthusiastic about finding answers to questions given by the teacher. In general, the learning process using the TGT method will provide individual satisfaction for each student in the learning process. This directly or indirectly will offer a separate impetus for students to study hard.

These results are consistent with research conducted by Istiqomah et al., Which states that

by using the TGT method, all participants in the group feel pleasure because they perceive the ongoing learning process as if it were a game [15]. And the winner is determined from the group that answered the most questions. In addition, there are scramble questions with more significant points that make the game atmosphere more lively in the hope that students will be more enthusiastic about answering the following questions.

In-class groups using the STAD method, learning is carried out by discussing with each team member. During the discussion process, each participant is given a worksheet that contains a summary of the material and several questions that each participant must work on. Still, to get a consensus, it is necessary to conduct deliberation first. The STAD learning method will increase students' activeness in the material "Forces and Their Effects." This is because the STAD method divides group members heterogeneously. Students who previously tended to be passive will be encouraged to become more active because other team members influence them.

The final stage analysis of the affective aspects of students obtained results which can be seen in Table 6. below:

Table 6. The results of the F test of the student's affective aspects

F_{table}	F_{cal}	Description
	1.28	H_{0a} Accepted
3.62	3.75	H_{1b} Accepted
	1.44	H_{0ab} Accepted

Because $F_{cal} (1.28) < F_{table} (3.62)$, then H_{0a} is accepted and H_{1a} is rejected; thus, it can be said that there is no influence between the learning model of experimental class I and the practical class II on the learning outcomes of students' affective aspects. Because $F_{b} count (3.75) > F_{table} (3.62)$, then H_{0b} is rejected, and H_{1b} is accepted; thus it can be said that there is an influence between scientific literacy on

learning outcomes in the affective aspects of students. Because $F_{ab\text{ cal}} (1.44) < F_{table} (3.62)$, then H_{0ab} is accepted and H_{1ab} is rejected; thus, it can be said that there is no interaction between STAD and TGT learning methods with scientific literacy on learning outcomes in the affective aspects of students.

The mean value of learning outcomes in the affective aspects found in the class with the STAD learning method above is relatively better than the TGT learning method. This is because students tend to have high enthusiasm, interest, and interest in science learning in the classroom using the STAD method rather than TGT [16].

The results of the second hypothesis testing using two-way ANOVA showed a difference in the effect of scientific literacy skills in the high and low categories on students' cognitive learning outcomes in the material "Forces and Their Effect." In line with this, in the affective aspect, students with high scientific literacy abilities also have better learning outcomes than students who have low category scientific literacy abilities. Assessment of affective learning outcomes aims to determine the attitudes of students, both in learning materials, learning methods, teachers, and classmates after the learning process ends. Students who have low scientific literacy skills will tend to choose unfavorable questionnaire answers so that their learning outcomes are more down than students who have high scientific literacy abilities.

The results of testing the third hypothesis using two-way ANOVA show that there is no interaction between learning methods and scientific literacy on cognitive and affective learning outcomes, as can be seen in Table 7. below:

Tabel 7. Two-ways ANOVA of interaction between learning methods and scientific literacy on cognitive and affective learning outcomes

F_{table}	F_{cal}	Description
2.86	3.62	H_0 Accepted
2.14		

The absence of an interaction between learning methods and scientific literacy on cognitive and affective learning outcomes means no difference in effect between classes using STAD or TGT learning techniques in terms of scientific literacy. This also means that regardless of the active learning method used, either STAD or TGT, students with high scientific literacy abilities have better cognitive and affective learning outcomes than students with low scientific literacy.

CONCLUSION

From the research that has been conducted, it is concluded that there is an effect of STAD and TGT learning methods on students' cognitive learning outcomes. Still, STAD and TGT learning techniques have no effect on students' affective learning outcomes in the material "Forces and Their Effect." There is an effect of high and low scientific literacy on student learning outcomes in the material "Forces and Their Effect," both on cognitive and affective aspects. Finally, there is no interaction between STAD and TGT learning methods with high and low scientific literacy skills on student achievement in "Forces and Their Effect" both in cognitive and affective aspects.

Suggestions that can be given from the research done are that in implementing STAD and TGT learning methods, educators must prepare mature learning tools such as items for learning outcomes and questionnaires. In addition, educators must also provide exciting and interactive text presentations to not make students lazy in the learning process. Finally, the results of this study are expected to be a reference for schools to conduct academic supervision of teachers to improve student learning outcomes.

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