eduvest

Vol 1, No 4, April -, 2021
p-ISSN 2775-3735- e-ISSN 2775-3727

COOPERATIVE LEARNING MODELS OF LEARNING EFFECTIVENESS *TAI* AND *STAD* TYPE IN IMPROVING STUDENT'S CRITICAL THINKING

Yhusita Tyas Margaretha, Agustina Tyas Asri Hardini
Universitas Kristen Satya Wacana
E-mail: 292017020@student.uksw.edu, agustina.hardini@uksw.edu

Received:**April 10th, 2021**
Revised: **April 16th, 2021**
Approved:**April 17th, 2021**

Abstract

This study aims to determine the level of effectiveness of the cooperative learning model type TAI "Team Assisted Individulization" and type STAD "Student Teams Achievement Divisions" as a learning model in improving the critical thinking of elementary school students of class V in science subjects. This experimental research was in the form of a Quasi Experimental Design. The research design used is a quasi-experimental research using the nonequivalent control group design pattern. This research is an experimental research conducted at SD Negeri Polobogo 03 and SD Negeri Polobogo 02 which are located in Polobogo Village. The research was conducted from February to March in the second semester of the academic year 2021/2022 which was carried out in class V. The samples in this study were obtained through probability sampling techniques with purposive random sampling type. Based on the research results, the effectiveness of the cooperative learning model type TAI "Team Assisted Individulization" showed an average increase of 28.57% greater than the cooperative learning model type STAD "Student Teams Achievement Divisions" which was 26.75%. Based on the results of the research hypothesis test using the mean difference test on the independent sample t-test, it shows that there is a significant difference between the cooperative learning model of the TAI type "Team Assisted Individulization" and the cooperative learning model of the STAD type "Student Teams Achievement Divisions" in terms of ability results. critical thinking of students in science subjects.

Keywords: *Team Assisted Individulization, Student Teams Achievement Divisions, Critical Thinking Ability.*

INTRODUCTION

Education is a science that is the goal in carrying out learning activities both at school and outside of school to add and broaden the knowledge they have. According to Article 2 (Law, 2003), national education functions to develop capabilities and shape the character and civilization of a nation with dignity to educate the nation's life. Education aims to develop the potential of students to become human beings who believe and fear God Almighty, have a noble character, are healthy, knowledgeable, capable, creative, independent, and become democratic and responsible citizens.

Following the mission and educational goals stated in Law no. 20 of 2003 above, Government Regulation of the Republic of Indonesia No. 19 of 2005 Chapter III Article 7 Paragraph 3 states that in primary school education is regulated in a curriculum content

that includes Mathematics, Languages, Natural Sciences, Skills, and Local Content.

Republic of Indonesia Government Regulation No. 19 of 2005 Chapter III Article 7 Paragraph 3 following the attachment to Permendiknas No. 22 of 2006 concerning the content standard for basic education units according to the curriculum structure of the education unit, five subjects must be taught, one of which is the content of science subjects. The content of science learning needs to be applied in elementary schools because education is a science that plays an important role in advancing human thinking that leads to inquiry and action so that it is hoped that it can help students to gain a deeper understanding of the natural surroundings.

According to (Sari, 2019) science is a branch of knowledge that originates from a natural phenomenon. Meanwhile, according to (MANU, 2020) Science is defined as a collection of knowledge about objects of natural phenomena obtained from the results of thoughts carried out by experimenting using scientific methods. Therefore, the science curriculum refers to the study of natural phenomena, so the approach used must be appropriate and oriented towards students so that they can learn creatively and effectively.

Based on the two definitions above, it can be concluded that science is a science related to examining the collection of knowledge about objects of natural phenomena. In the concept, not only the mastery of a collection of knowledge in the form of facts, concepts, and principles which are the basis for the discovery process. Science education is expected to be a vehicle for learning for students in learning natural materials around themselves and themselves (Nurdyansyah, 2018).

This is an important role for teachers in carrying out their duties as educators in determining and providing what students learn to enrich their learning experiences. As agents of renewal, teachers are required to be active and creative (Sulfemi, 2019). In carrying out their duties, the teacher needs to use the right learning model to make it easier for students to understand the material presented (Nurdyansyah & Fahyuni, 2016). In this case, the teacher only acts as a facilitator so that students play an active, creative role so that they can train students' minds to think critically in developing self-potential (Fristadi & Bharata, 2015).

One of the components that influence the success of a learning process is the learning model used in each learning activity with the relevant model as the teaching material used. According to (Rahman, 2018) the learning model is a design of teacher learning activities for students that refers to interactions with elements related to learning, namely teachers, students, learning media as teaching materials, and material as the subject. According to (Parasamya, Wahyuni, & Hamid, 2017) interesting learning and triggers students to interact well can be done through the application of relevant learning models, with relevant models focusing students on the material being taught. For this reason, in determining a learning model that is relevant and able to attract student's attention, the ability of competent teachers is needed so that students can increase their level of critical thinking and increase their learning creativity in depth (Pianda, 2018).

Therefore, first, two types of cooperative learning models are explained, namely the type of TAI (Team Assisted Individualization) and STAD (Student Teams Achievement Divisions) as learning models. According to Slavin (1984) in (Setiawan & Prihatnani, 2020), TAI is a pedagogical learning program that links the learning process with individual student differences at the academic level.

The application of the TAI type cooperative learning model "Team Assisted Individualization" is a learning model solution to improve students' critical thinking skills which affect their learning outcomes (Hardiyanti, 2018). This learning model is student-centered (Student-Centered) in shaping learning activities k heterogeneous study groups,

using student worksheet sheets (student worksheets) in groups then discussing

understanding and finding a concept about the material that has been discussed.

The TAI type of cooperative learning model "Team Assisted Individualization" emphasizes group rewards, the responsibility of each individual to get the same opportunity to share with each member of the group (Lestari, 2014). The purpose of this model is to minimize individual teaching to increase knowledge, become trained students' critical thinking abilities, and motivate students through group learning that is formed.

Meanwhile, Wilna in (Setyomukti, 2012) explained that the STAD (Student Teams Achievement Divisions) cooperative learning model is a learning model which is one of the criteria for improving student learning achievement through critical thinking. So that it is embedded in students to be motivated and have high motivation which affects the level of their thinking patterns related to learning material.

Judging from the syntax, the cooperative learning model type TAI "Team Assisted Individualization" and STAD "Student Teams Achievement Divisions" look different, but have one side in common, namely through this learning model students are required to have the ability to explore critical thinking and be able to solve related problems. learning materials.

The efficacy of the TAI type of cooperative learning model "Team Assisted Individualization" has been proven by (Arningsih, Suardana, & Selamet, 2018) based on the results of his research entitled Comparison of Cooperative Learning Model Type Teams Assisted Individualization and Cooperative Learning Model Type Student Team Achievement Divisions on Problem Solving Ability. Ipa Viii Junior High School Students who have learning effectiveness in addition to high learning outcomes. In his research, students are encouraged to learn independently, be able to explore knowledge both their own experiences which are used to study and understand learning material so that students can receive material meaningfully so that they can develop a level of critical thinking.

Observing the various potentials of the two learning models and the results of research that show the efficacy of the two models empirically will certainly help teachers in choosing a learning model to be applied in the science learning process in elementary schools. It can be seen from the equally well-applied potential that it does not become a doubt for the teacher to apply a relevant model for science subjects in elementary schools. Through this research, researchers participated in proving that from several existing learning models, researchers were interested in examining the efficacy of the TAI and STAD cooperative learning models as models to be applied.

RESEARCH METHODS

This type of research is an experimental research in the form of a Quasi Experimental Design. The research design used is a quasi-experimental research using the nonequivalent control group design pattern. This research was conducted at SD Negeri Polobogo 03 and SD Negeri Polobogo 02 which are located in Polobogo Village. The two primary schools are in one area, namely Getasan District, Semarang Regency, Central Java. Both SD are included in the Kartini Cluster.

This research was conducted by researchers at SD Negeri Polobogo 01 and SD Negeri Polobogo 03 Semarang Regency. The population in the study were all students from SD Negeri Polobogo 01 and SD Negeri Polobogo 03. While the sample in this study were students of class V SD Negeri Polobogo 01 as an experimental group with a total of 21 students and students at SD Negeri Polobogo 03 as a control group with the number of students is 20 students

The research was conducted from February to March in the second semester of

the

academic year 2021/2022 which was carried out in class V. The samples in this study were obtained through probability sampling techniques with the type of purposive random sampling.

The data collection technique used in this study was the critical thinking ability of elementary school students in class V. In obtaining the data, the researcher used several steps, including documentation and test techniques to be used as data collection methods.

RESULTS AND DISCUSSION

A. Research Results

1. Descriptive Analysis

In this study, descriptive analysis was used based on the results score after treatment between the experimental group and the control group, then presented in the form of a statistical descriptive table containing the minimum value which would later be processed using SPSS 26.00 for windows software. The purpose of using this descriptive analysis, the researcher can find out the data on the results of differences in student learning outcomes from the two groups who are given different treatments. Thus the data presented is data on student learning outcomes before being given treatment or pretest as data to measure students' initial critical thinking skills in science subjects, so that later data on learning outcomes will be obtained after receiving treatment or posttest.

2. Learning Outcomes Data for Experiment Class Learning Model TAI "Team Assisted Individulization"

Based on the results of the data obtained related to the pretest and posttest learning outcomes consisting of the lowest score, the highest value, the average and the standard deviation. The following is a table of data on the results of the following experimental group:

Table 3
Experimental Group Learning Outcomes Data

Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
pretest	21	25	75	53.33	13.814
posttest	21	65	95	81.90	8.136
Valid N (listwise)	21				

Based on the data obtained through the table above, it can be seen that the pretest average value in the experimental group before being given a treatment using the TAI "Team Assisted Individulization" learning model is 53.33. Then after being given a treatment using the TAI learning model "Team Assisted Individulization" the average value became 81.90. The highest score before being given a treatment uses the TAI "Team Assisted Individulization" learning model, which is 75 and the lowest score is 25. Then after being given a treatment using the TAI "Team Assisted Individulization" learning model, the highest score becomes 95 and the lowest score becomes 65.

In this study, the frequency table was used to process data on student learning outcomes in the experimental group. The frequency table of the experimental group pretest learning outcomes is as follows:

1) Data Range (J)
J = Nmak – Nmin
= 75 – 25
= 50
2) Class Interval (k)
K = 1 + 3,3 log n
= 1 + 3,3 log 21
= 1 + 4,36
= 5,36
= 5
3) Class Length (h)
P = p/k
= 50/5
= 10

Thus it can be concluded that the number of interval classes is 5 with the class length is 10.As for the pretest frequency distribution table for the experimental group, as follows:

Table 4
Frequency Distribution of Experimental Group Pretest

No.	Interval	Frequency	Percentage
1.	25 – 29	1	5,56%
2.	30 – 34	0	0%
3.	35 – 39	1	5,56%
4.	40 – 44	4	22,2%
5.	45 – 49	2	11,2%
6.	50 – 54	2	11,2%
7.	55 – 59	2	11,2%
8.	60 – 64	2	11,2%
9.	65 – 69	3	16.7%
10	70 – 74	3	16.7%
Total		18	100%

Based on the frequency distribution table of the experimental group pretest in the table above, it is known that students who get a value of learning outcomes between 25-29 are as many as 1 student with a percentage of 5.56%, while students who get a score of 35-39 are 1 student with a percentage gain. amounted to 5.56%, then the acquisition value of learning outcomes between 40-44 was 4 students with a percentage acquisition of 22.2%.

Whereas for students who got a score between 45-49 as many as 2 students with the acquisition of a percentage value of 11.2%, then for the acquisition value between 50-54 is 2 students with a percentage acquisition of 11.2%, then the acquisition value between 55 -59 as many as 2 students with a percentage acquisition of 11.2%, then the acquisition value between 60-64 as many as 2 students with a percentage acquisition of 11.2%, while the acquisition value between 65-69 was 3 students with a percentage acquisition of 16.7 %, and the acquisition value between 70-74 as many as 3 students with a percentage acquisition of 16.7%.

Based on data processing from student learning outcomes on the posttest results using the experimental group frequency distribution table, as follows:

1) Data Range (J)
   J = Nmak – Nmin
   = 95 – 65
   = 30
2) Class Interval (k)
   K= 1 + 3,3 log n
   = 1 + 3,3 log 21
   = 1 + 4,36
   = 5,36
   = 5
3) Class Length (j)
   P = p/k
   = 30/5
   = 6

Thus it can be concluded that the number of interval classes is 5 with the class length is 6.As for the pretest frequency distribution table for the experimental group, as follows:

Table 5
Posttest Frequency Distribution of Experiment Group

No.	Interval	Frequency	Percentage
1.	65 – 69	1	5,56%
2.	70 – 74	3	16,7%
3.	75 – 79	4	22,2%
4.	80 – 84	5	27,8%
5.	85 – 89	3	16,7%
6.	90 – 94	2	11%
Total		18	100%

Based on the frequency distribution table of the posttest experimental group in the table above, it is known that students who get a learning result value between 65-69 are 1 student with a percentage of 5.56%, while students who get 70-74 scores are 3 students with a percentage gain. amounted to 16.7%, then the acquisition value of learning outcomes between 75-79 was 4 students with a percentage acquisition of 22.2%. Whereas for students who received scores between 80-84 as many as 5 students with a percentage value of 27.8%, then for the acquisition of values between 85-89 were 3 students with a percentage acquisition of 16.7%, then the acquisition value was between 90 -94 for 2 students with a percentage gain of 11%.

3. Data on Learning Outcomes for Control Class STAD Learning Model

Based on the results of the data obtained related to the pretest and posttest learning outcomes consisting of the lowest score, the highest value, the average and the standard deviation. The following is a table of data obtained from the following control group:

Table 6
Control Group Study Result Data
Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
pretest	20	30	70	52.00	12.074
posttest	20	45	95	78.75	13.463
Valid N (listwise)	20				

Based on the data obtained through the table above, it can be seen that the pretest average value in the control group before being given a treatment using the STAD learning model is 52.00. Then after being given a treatment using the STAD learning model the average value became 78.75. The highest score obtained before being given a treatment uses the STAD learning model of 70 and the lowest score is 30.Then after being given a treatment using the STAD learning model the highest score becomes 95 and the lowest score becomes 45.

In this study, the frequency table is used for data processing of control group student learning outcomes. The frequency table of the experimental group pretest learning outcomes is as follows:

1. Data Range (J)
   J = Nmak – Nmin
   = 70 – 30
   = 40
2. Class Interval (k)
   K = 1 + 3,3 log n
   = 1 + 3,3 log 20
   = 1 + 4,29
   = 5,29
   = 5
3. Class Length (j)
   P = p/k
   = 40/5
   = 8

Thus it can be concluded that the number of interval classes is 5 with the class length of 8.As for the control group pretest frequency distribution table, as follows:

Table 7
Pretest Frequency Distribution Control group

No.	Interval	Frequency	Percentage
1.	30 – 34	1	6,25%
2.	35 – 39	1	6,25%
3.	40 – 44	3	19%
4.	45 – 49	3	19%
5.	50 – 54	2	12,5%
6.	55 – 59	3	19%
7.	60 – 64	1	6,25%
8.	65 – 69	2	12,5%
Total		16	100%

Based on the frequency distribution table of the control group pretest in the table above, it is known that students who get a value of learning outcomes between 30-34 are as many as 1 student with a percentage of 6.25%, while students who get a score of 35-39 are 1 student with a percentage gain. amounted to 6.25%, then the acquisition value of learning outcomes between 40-44 is as many as 3 students with a percentage acquisition of 19%. Whereas for students who got a score between 45-49 there were 3 students with a percentage value of 19%, then for the acquisition value between 50-54 were 2 students with a percentage gain of 12.5%, then the acquisition value was between 55-59. as many as 3 students with a percentage gain of 19%, while students who got a percentage of 60-64 were 1 student with a percentage gain of 6.25%, and 65-69 as many as 2 students with a percentage gain of 12.5%.

Based on data processing from student learning outcomes on the posttest results using the control group frequency distribution table, as follows:

1) Data Range (J)
   J = Nmak – Nmin
   = 95 – 45
   = 50
2) Class Interval (k)
   K = 1 + 3,3 log n
   = 1 + 3,3 log 20
   = 1 + 4,29
   = 5,29
   = 5
3) Class Length (j)
   P = p/k
   = 50/5
   = 10

Table 8
Control Group Posttest Frequency Distribution

No.	Interval	Frequency	Percentage
9.	30 – 34	1	6,25%
10.	35 – 39	1	6,25%
11.	40 – 44	3	19%
12.	45 – 49	3	19%
13.	50 – 54	2	12,5%
14.	55 – 59	3	19%
15.	60 – 64	1	6,25%
16.	65 – 69	2	12,5%
Total		16	100%

Based on the frequency distribution table of the experimental group posttest in the table above, it is known that students who get a learning result value between 45 - 49 are 1 student with a percentage of 5.56%, while students who get a score of 55 - 59 are 1 student with a percentage gain. amounted to 5.56%, then the acquisition value of learning outcomes between 65 - 69 was 2 students with a percentage of 11%. Whereas for students who received scores between 70 - 74 there were 3 students with a percentage value of 16.7%, then for the acquisition of values between 75 - 79 were 2 students with a percentage acquisition of 11%, then the acquisition value between 80 - 84 as many as 3 students with

a percentage acquisition of 16.7%, then the acquisition value between 85 - 89 as many as 3 students with a percentage acquisition of 16.7%, while the acquisition value between 65-69 was 3 students with a percentage acquisition of 16.7%, and the acquisition value between 90 - 94 as many as 3 students with a percentage acquisition of 16.7%.

4. The Difference In The Average Score Of The Experimental Group And The Control Group

In this study, the researcher tested the difference in the average score before and after the treatment was given to determine the extent to which the learning model applied could be said to be effective. Thus the average pretest and posttest scores from the experimental group and the control group are as follows:

Table 8
Average Value of Experiment Group and Control Group

Class	Pretest	Posttest	Change in Results
Experiment	53,33	81,90	28,57
Control	52,00	78,75	26,75

Based on the comparison in the table above, it shows that there has been a change in learning achievement in both the experimental group and the control group. Thus it can be seen that there is a change in learning achievement achievement that is greater in the experimental group than in the control group. Changes that occur have increased by 28.57 after being given a treatment using the learning model in the experimental group.

Based on the distribution of the learning achievement interval in the experimental group it is in the high category while the control group is in the medium category. Thus it can be seen that the use after being given treatment by applying the learning model in the experimental group has an increase in learning outcomes. Thus it can be said that the learning model applied to the experimental group can be said to be effective in improving the critical thinking of fifth grade students in science subjects.

B. Data Analysis

This study used descriptive data analysis as a prerequisite test consisting of a normality test and a homogeneity test. as a prerequisite test is carried out before the difference test (t) with the aim of knowing whether there is a difference in the average of the experimental group and the control group.

1. Test Requirements

Normality test

a) Experiment Group

In conducting the normality test of the experimental group on students' critical thinking skills through student learning achievement, this study used a tool in the form of Analyze, non-parametric one-sample Kolmogorov Smirnov test with the Shapiro-Wilk technique using SPSS 26.00 for windows software. Then from the test results it was found that the preset and posttest results of class V students were normally distributed. This can be seen based on the significance level of $p > 0.05$ which is equal to 0.383 from the pretest results and 0.271 from the posttest results. based on this data, the test table can be seen as follows:

Table 10
Experimental Group Normality Test

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
kelas		Statistic	df	Sig.	Statistic	df	Sig.
hasil	pretest	.134	21	.200*	.953	21	.383
	posttest	.151	21	.200*	.945	21	.271

Based on the results of the normality test of the experimental group between the pretest and posttest results, if seen through the test table, it means that, if a significance value is obtained <0.05, the data is not normally distributed, but if a significance value is obtained> 0.05, the data obtained normally distributed. Thus it can be concluded that, the data from the normality test of the experimental group is normally distributed.

The level of significance of the pretest value in the experimental group using the TAI learning model "Team Assisted Individualization" is 0.383> 0.05, which means that it is normally distributed.

The significance level of the posttest value in the experimental group using the TAI learning model "Team Assisted Individualization" is 0.271> 0.05, which means that it is normally distributed.

b) Control Group

In conducting the normality test of the experimental group on student learning achievement through critical thinking, this study used a tool in the form of the Analyze, non-parametric one-sample Kolmogorov Smirnov test with the Shapiro-Wilk technique using SPSS 26.00 for windows software. Then from the test results it was found that the preset results and posttest class V students are normally distributed. This can be seen based on the significance level of p> 0.05 which is equal to 0.369 from the pretest results and 0.264 from the posttest results. based on this data, the test table can be seen as follows:

Table 11
Control Group Normality Test

Tests of Normality

		Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	class	Statistic	df	Sig.	Statistic	df	Sig.
result	pretest	.119	20	.200*	.950	20	.369
	posttest	.132	20	.200*	.942	20	.264

Based on the results of the control group normality test between the pretest and posttest results, if seen through the test table, it means that, if a significance value is obtained <0.05, the data is not normally distributed, but if a significance value is obtained> 0.05, the data obtained normally distributed. Thus it can be concluded that, the data from the normality test of the experimental group is normally distributed.

The significance level of the pretest value in the experimental group using the TAI "Team Assisted Individualization" learning model was 0.369> 0.05, which means that it is normally distributed.

The level of significance of the posttest value in the experimental group using the TAI learning model "Team Assisted Individualization" is 0.264> 0.05, which means that it is normally distributed.

Homogeneity Test

The next step before the difference test is to test the homogeneity of the data. The data homogeneity test meant whether the data from the two groups between the experimental group and the control group obtained had the same variant or not. In conducting the homogeneity test, the Levene's Test was carried out. Based on data from the results of the study, the data can be said to be homogeneous if the significance value is> 0.05 and the data is not homogeneous if the significance value is <0.05. Thus the test results can be seen in the table, as follows:

Table 12
Homogeneity Test of Data Before Treatment
Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
hasil	Based on Mean	.721	1	39	.401
	Based on Median	.619	1	39	.436
	Based on Median and with adjusted df	.619	1	38.540	.436
	Based on trimmed mean	.702	1	39	.407

Based on the data from the table above, the results of the homogeneity test using the Levene's Test method are obtained, which chooses one of the statistical interpretations based on the average of the Based on Mean. Thus it can be seen that the results of the homogeneity test before being given the treatment obtained a significance value of 0.401 where the significance value> 0.05, which means that both the experimental group and the control group have the same variants in other words, namely homogeneous.

Table 13
Homogeneity Test of Data After Treatment
Test of Homogeneity of Variance

		Levene Statistic	df1	df2	Sig.
hasil	Based on Mean	2.933	1	39	.095
	Based on Median	2.296	1	39	.138
	Based on Median and with adjusted df	2.296	1	32.758	.139
	Based on trimmed mean	2.701	1	39	.108

Based on the data from the table above, the results of the homogeneity test using the Levene's Test method are obtained, which chooses one of the statistical interpretations based on the average of the Based on Mean. Thus it can be seen that the results of the homogeneity test before being given the treatment obtained a significance value of 0.095 where the significance value> 0.05, which means that both the experimental group and the control group have the same variants in other words, namely homogeneous.

Different Test

The final step in this research is to do a different test. Different tests were conducted to determine whether there were differences in learning achievement between students who were treated or not given treatment from the experimental group and the control group. Thus the test results can be seen through the table, as follows:

Table 14
Data Difference Test
Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
									95% Confidence Interval of the Difference	
		F	Sig.	t	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	Lower	Upper
Kemampuan berpikir kritis	Equal variances assumed	2.664	.111	8.718	39	.000	28.714	3.294	22.052	35.377
	Equal variances not assumed			8.652	34.756	.000	28.714	3.319	21.975	35.453

Based on the t test analysis from the table above using the independent sample T test, it can be interpreted that based on the data tested, the t count is 8.718 with a significance value found in the sig column. (2-tailed) of 0,000. The mean difference between the experimental group and the control group in the mean difference column is 28.714. Thus the t table that can be obtained from the table above is 1.585.

Hypothesis testing

Based on the results of the Independent Sample T-Test in the table, the next step is to test the research hypothesis data. The data in the research hypothesis will determine whether the hypothesis can be accepted or not. Thus the following in the research carried out, as follows:

H0: $\mu 1 \leq \mu 2$ There is no significant difference in the effectiveness of critical thinking skills in grade V SD in the TAI learning model "Team Assisted Individualization" and STAD "Student Teams Achievement Divisions".

Ha: $\mu 1 \geq \mu 2$. There is a significant difference in effectiveness on the critical thinking skills of grade V SD in the TAI learning model "Team Assisted Individualization" and STAD "Student Teams Achievement Divisions".

The criteria for making decisions are as follows:

1) Using the Sig. based on the provisions:

If the value is Sig. count Probability <0.05 then H0 is rejected.

If the value is Sig. count Probability> 0.05 then Ha is accepted.

2) Using the t coefficient count with the following conditions:

If the t value <0.05 then H0 is rejected.

If the value of t count> 0.05 then Ha is accepted.

C. Data Description

Based on the results of research conducted when viewed from the average results of the pretest and posttest in the critical thinking ability of students both from the experimental group who were given treatment using the TAI learning model was higher than the control group using the STAD learning model. Thus it can be concluded that the experimental group using the TAI learning model is more effective than using the control group.

Thus the researcher conducted the N-Gain test to strengthen the effectiveness of a learning model that was used through the application of the two learning models between the TAI learning model and STAD learning. The formula used in the N-Gain test is as follows:

$$\text{N-Gain: } \frac{S\ posttest - S\ pretest}{S\ \max - S\ Pretest}$$

Information:

S Posttest : Score Posttest

S Pretest : Score Pretest

S max : Score Maximum Ideal

Table 15
N-Gain Score Category Acquisition

Limitation	Category
g > 0,7	High
0,3 < g ≤ 0,7	Medium
g < 0,3	Low

As for the results of the N-Gain test analysis to see the effectiveness of the two learning models of TAI "Team Assisted Individualization" and STAD learning "Student Teams Achievement Divisions", can be seen in the table, as follows:

Table 16
Experimental Class N-Gain Test Results

No.	N-Gain	Category
1.	0.83	High
2.	0.5	Medium
3.	0.58	Medium
4.	0.71	High
5.	0.5	Medium
6.	0.38	Medium
7.	0.86	High
8.	0.5	Medium
9.	0.43	Medium
10.	0.67	Medium
11.	0.6	Medium

12.	0.5	Medium
13.	0.56	Medium
14.	0.62	Medium
15.	0.42	Medium
16.	0.8	High
17.	0.64	Medium
18.	0.82	Tinggi
19.	0.67	Medium
20.	0.5	Medium

Table 17
Control Class N-Gain Test Results

No.	N-Gain	Category
1.	0.43	Medium
2.	0.14	Low
3.	0.46	Medium
4.	0.67	Medium
5.	-0.1	Low
6.	0.78	High
7.	0.64	Medium
8.	0.83	High
9.	0.83	High
10.	-0.17	Low
11.	0.6	Medium
12.	0.58	Medium
13.	0.73	High
14.	0.78	High
15.	0.5	Medium
16.	0.64	Medium
17.	0.33	Medium
18.	0.18	Low
19.	0.63	Medium
20.	0.83	High

Table 18
Average N-Gain Test Results for Experiment Class and Control Class

No.	Group	Averange
1.	Eksperimen	0,59
2.	Control	0,51

Based on the results of the N-Gain test in the experimental group with treatment using the TAI learning model "Team Assisted Individualization" showed that there was an increase of 0.59, which means that the average experimental group experienced an increase in the moderate category. While the average results of the control group treated using the STAD learning model "Student Teams Achievement Divisions" also showed an increase of 0.51 with the control group's average in the moderate category. Thus it shows that the experimental group has a higher increase compared to the control group.

D. Discussion

Based on the data analysis of research results that have been carried out by researchers using two learning models including the TAI learning model and the STAD learning model, it has been proven to improve the critical thinking skills of grade V elementary school students in science subjects. This can be seen based on several aspects in improving students' critical thinking skills, including identifying the subject matter, determining and analyzing questions, strategies for concluding data and categorizing. This research activity was carried out based on a pretest to find out earlier students' critical thinking abilities, then give a treatment to students using the learning model in the experimental group and the STAD learning model in the control group.

In addition, after being given a pretest as an initial ability, the next step is that students are given a posttest to determine the level of critical thinking of students after being given the treatment, the goal is to see the results of a significant difference in value. Thus the researchers conducted an analysis that the TAI learning model had an increase of 18% compared to the STAD learning model which only experienced an increase of 16%. Thus, based on the results of the study, it can be concluded that the TAI learning model is more effective in improving the critical thinking skills of fifth grade elementary school students in science subjects compared to using the STAD learning model.

Based on the results of research on success in improving students' critical thinking skills using the TAI learning model, the results of this study strengthen research with previous studies that have been conducted by (Arningsih et al., 2018) which shows that the TAI type cooperative learning model can improve IPA learning outcomes of fourth grade elementary school students with the results of the study that there was a significant difference between the group of students who were taught with the TAI type of learning model compared to the group of students who were taught with the conventional model..

CONCLUSION

Based on the results of the research that has been done, it can be concluded that the cooperative learning model of TAI type "Team Assisted Individulization" is proven to be more effective than using the cooperative learning model of STAD "Student Teams Achievement Divisions". The effectiveness of the TAI type “Team Assisted Individulization” cooperative learning model can be seen based on the average results of 81.90 which experienced a moderate increase with an N-Gain value of 0.59. Meanwhile, the STAD cooperative learning model "Student Teams Achievement Divisions" obtained a lower average score than the TAI type "Team Assisted Individulization" cooperative learning model, which was 78.76 with an N-Gain value of 0.51. Thus, based on the results of the average value and the N-Gain value which explains that the TAI type “Team Assisted Individulization” cooperative learning model is more effective in improving the critical thinking skills of grade V elementary school students in science subjects compared to the cooperative learning model. STAD “Student Teams Achievement Divisions”.”.

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