The Implementation of Team Assisted Individualization Model Integrated with Mathematics Project Learning

*Fidelia Vidijanti[1]

[1]*SMA Frater Makassar*

Corresponding author. Email: fideliavidijanti7@gmail.com

ABSTRACT

This study aims to answer the problems teachers often face in teaching comparative trigonometry subjects by applying the Team Assisted Individualization Method based on Mathematics Project Learning in the first-grade students of science class at Frater Senior High School Makassar. This research used a descriptive quantitative approach with random technique sampling of three groups. The data collection technique used in this research is the performance assessment. The students learning outcomes were analyzed by paired sample t-test. The analysis showed that the average scores of pretest were 27.53 and postest 83.20 out of 100. After comparing pretest and posttest scores using paired sample t-test with 95% confidence level ($t = -89.486, p = 0.000$), it is concluded that the learning achievement of students of Frater Senior High School Makassar after learning with teams assisted individualization (TAI) model (posttest) is higher than the learning achievement of the students before the research (pretest).

Keywords: Team Assisted Individualization Model, Mathematics Project Learning.

1. INTRODUCTION

During this Covid 19 Pandemic time, we are forced to follow the Health Protocols by keeping a distance, studying from home, wearing masks, and washing hands. It also inevitably affects the student life as they have to study independently. Many students have difficulty independent learning nowadays, especially if they only read or just watch learning videos without any social interaction. Therefore, professional teacher skills are needed in managing and developing learning models that will be used in Distance Learning (PJJ).

If we take a closer look, students' learning achievement, especially in the Trigonometry Comparison material for the first-grade of science class of Frater Senior High School Makassar, is still not optimal. This method tries to improve the achievement and interest in students' learning using Project-based Learning. This method is one of the recommended lessons applied to Mathematics Learning in the 2013 Curriculum[1]. This learning links technology with problems in everyday life that are familiar to students. According to Waras, "Project-

based learning is a project that focuses on product development or performance (Performance) [2].

Students carry out activities to organize group learning activities, conduct studies or research, solve problems and synthesize information.

The initiative to improve students' learning achievement should be started earlier by identifying students with high, medium, and normal skills. Therefore, during the learning process, teachers can provide appropriate treatment to students. One of the Learning Models that can help students better understand the Trigonometric Comparison material is the TAI (Team Assisted Individualization) Model [3]. Team Assisted Individualization (TAI) learning has procedures that explicitly provide more opportunities for students to think, answer and help each other[4]. Thus, students are expected to be active and able to respond to the material presented by the teacher, and each individual is also taught to learn independently and work in groups.

The Team Assisted Individualization (TAI) Learning Model has several stages: 1) Teams, the formation of heterogeneous groups consisting of 4-5

students. 2) Placement Test, giving pre-test to students so that the teacher knows the weaknesses of students. 3) Curriculum Materials, material that students finish following the existing curriculum. 4) Teams Study the stages of learning actions that groups must carry out. Teachers only provide individual assistance to students in need. Students are given essential questions with topics according to their day-to-day life. Finally, they can discuss the results with their respective groups. 5) Presentation Teams stage presents the results of each group. 6) Teams Score and Team Recognition gives a score to group work's result. 7) Teaching Group stage is when the teacher gives a short material before giving the test. 8) Fact Test is the implementation of small tests (post-test) to see the improvement of their learning achievement in the Trigonometry Comparison material [5].

2. RESEARCH METHOD

This research is quantitative research with a descriptive approach. The population consists of three groups with a random sampling of one class with 30 students. This study describes students' learning achievement through the application of the Teams Assisted Individualization Model in Project-based Learning Comparison of Trigonometry for the first-grade students of science class at Frater Senior High School Makassar [6]. The study used One Group Pretest-Posttest Design. To use this design, we can compare the results obtained by students in the pretest (before implementing the Teams Assisted Individualization model in Project Learning) with the results obtained by students in the posttest (after the implementation of the Teams Assisted Individualization Model in Project Learning). The design can be seen in the following table.

Table 1. Research Design

Pretest	Treatment	Posttest
O1	X	O2

Description:

X = Treatment
O1 = Pre-test
O2 = Post-test
(O2 – O1) = Effect of Treatment on Learning Achievement [7].

Treatment was carried out using Online and Offline methods. Online method using zoom, with the control center (host) on the teacher. While the offline method was carried out by students based on groups (4-5) people, where the meeting uses telegram and WhatsApp (WA) applications. The teacher also accompanied each group to obtain data in the process

of its performance. Each group is also facilitated by one zoom.

The test was carried out to measure students' learning ability after Online Learning through the application of the Teams Assisted Individualization Model. The scoring of the students' test results uses a free scale that depends on the item of the question.

To obtain data about the projects they carry out, skills in learning, and project implementation using the Performance Assessment Sheet taken during online learning using zoom.

The Learning Implementation Observation Sheet was arranged based on 4 categories, namely less (score 1), sufficient (score 2), good (score 3), and very good (score 4). The indicators used to reveal the teacher's ability to manage learning are based on the activities carried out by the teacher in the learning process as planned in the lesson plans.

The Performance Assessment Sheet in the Project assessment is based on 4 categories, namely low (score 1), sufficient (score 2), good (score 3), and very good (score 4), in the appropriate column regarding the project implementation process. For testing the hypothesis purposes, statistical tests were first carried out using the SPSS program. From the results of data processing, conclusions are drawn by testing the following hypothesis:

a) If the p-value > α, then H_0 is accepted, and H_1 is rejected, it means that there is no difference in student achievement before the research (pretest) and after learning the Teams Assisted Individualization (TAI) (posttest) model for the students of Frater Senior High School Makassar.

b) If the level of p-value < α then H_0 is rejected and H_1 is accepted, it means that the learning achievement of students of Frater Senior High School Makassar after learning with teams assisted individualization (TAI) model (posttest) is higher than the learning achievement of the students before the research (pretest).

3. RESEARCH FINDINGS AND DISCUSSIONS

The results of this study indicate that the learning achievement data of students in the first-grade students of Science Class at Frater Senior High School Makassar before and after treatment on the Trigonometric Comparison material is shown in table 2 below:

Table 2. Statistics of Student Mathematics Learning Outcomes Scores based on Pretest and Posttest Results

Statistic	Statistics Number	
	Pretest	Posttest
Sample Size	30	30
Highest Score	42	98
Lowest Score	12	64
Ideal Score	100	100
Range Score	30	34
Average Score	27,53	83,20
Standard Deviation	8,877	8,348

From the table above, it can be stated that the average score of students' post-tests has increased from the pre-test where the average pre-test score is 27.53 with a score range of 30 while the post-test average score is 83.20 with a score range of 34.

The pre-test and post-test results are grouped into five categories, so the distribution of the frequency and percentage of scores is shown in table 3 below.

Table 3. Distribution and Percentage of Scores of Students' Learning Outcomes of Frater Senior High School of Makassar.

No	Question Indicator	Category	Pretest		Posttest	
			Frequency	Percentage (%)	Frequency	Percentage (%)
1	0 – 54	Very Low	30	100	0	0
2	55 – 64	Low			1	3
3	65 – 79	Average			5	17
4	80 – 89	High			18	60
5	90 – 100	Very High			6	20
Total			30	100	30	100

The average score of students' Mathematics learning achievement (pretest results) is 27.53, with a standard deviation of 8.877 from the ideal score of 100 is in a low category. It means that, in general, students' learning achievements are low. Meanwhile, the average score of student learning achievement (post-test) is 83.20, with a Standard Deviation of 8.348 from the ideal score of 100 in the high category. This means that, in general, students' learning achievements are in the high category. Furthermore, the percentage of students' Mathematics learning completeness before treatment (pretest) and after treatment (posttest) can be seen in Table 4 below:

Table 4. Description of Mathematics Learning Completion of the first-grade students of Science Class at Frater Senior High School Makassar.

Score	Categorization	Pretest		Posttest	
		Frequency	Percentage (%)	Frequency	Percentage (%)
75 – 100	Complete	0	0	25	83
0 – 74	Incomplete	30	100	5	17
Total		30	100	30	100

Table 4 shows that there were 30 people or all the students who did not achieve completeness before the pre-test. While the test results data after the post-test showed as many as 25 people or 83% of students achieved completeness and 5 people or 17% of other students did not achieve completeness. Suppose it is related to the Minimum Completeness Criteria (KKM) of learning achievement that applies at Frater Senior High School Makassar. In that case, the students' Mathematics learning achievement after being taught by the Teams Assisted Individualization Model application achieves classical completeness of 83%.

For Descriptive Statistical Results, the pre-test and post-test results of the first-grade student of Science Class at Frater Senior High School Makassar using the Statistical Package for Social Science (SPSS) version 26 can be seen from Table 5 below.

Table 5. Descriptive Statistics

	N	Minimum	Maximum	Mean	Std. Deviation
Pretest	30	12.00	42.00	27.5333	8.87745
Posttest	30	64.00	98.00	83.2000	8.34762
Valid N (listwise)	30				

From table 5, information is obtained that the pretest minimum and maximum scores achieved by students are 12.00 and 42.00, with a mean of 27.53 and a standard deviation of 8.88. Meanwhile, the posttest minimum and maximum scores achieved by students are 64.00 and 98.00, with a mean of 83.20 and a standard deviation of 8.35. The following is a *boxplot* of pre-test and post-test data
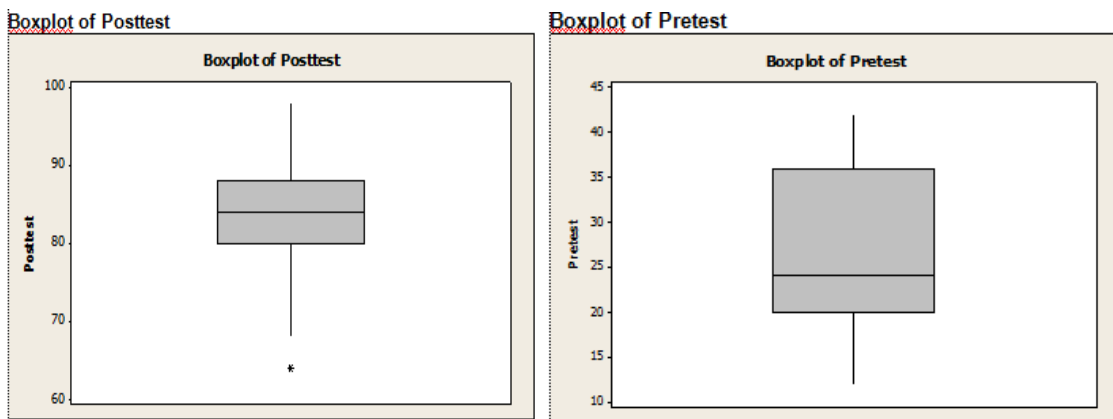

Figure 1. Boxplot of Pretest and Posttest

Based on the picture above, it can be seen that the median values of the pre-test and post-test are not the same. The post-test score is much higher than the median pretest score (the middle line crosses the box). From that, it can be said that in the 30 research samples, the students' post-test scores were much better than the pre-test scores, which indicated an increase in students' learning achievement when viewed from the median.

Table 6. Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Pretest	27.5333	30	8.87745	1.62079
	Posttest	83.2000	30	8.34762	1.52406

Table 7. Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Pretest & Posttest	30	.924	.000

Table 8. Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Pretest - Posttest	-55.66667	3.40723	.62207	-56.93895	-54.39439	-89.486	29	.000

The data of 30 students analyzed with SPSS above with significant level ($\alpha = 0.05$) show that $t = -89.486$ and probability 0.000/2 or 0.000. Because the probability (0.00) < significant value set (0.05), it means H_0 is rejected, and H_1 is accepted, or it can be concluded that the learning achievement of students of Frater Senior High School Makassar after learning with teams assisted individualization (TAI) model (posttest) is higher than the learning achievement of the students before the research (pretest).

4. CONCLUSIONS

Based on the results of the research and discussion above, the researcher concludes that the application of the Teams Assisted Individualization (TAI) model in project-based Mathematics learning with Comparison of Trigonometry topic for the first-grade students of science class at Frater Senior High School Makassar is:

1) The learning process with the teams-assisted individualization (TAI) model increases students' learning achievement.
2) Obtaining a classical completeness score (posttest) of 83.20 out of 100.
3) Students' activities observed during the learning with the Teams Assisted Individualization (TAI) model on Project-based learning are considered active.

5. SUGGESTIONS

Based on the results that have been achieved in this study, there are several suggestions to be considered:

1) The teacher must carry out supervision of each group in every learning implementation. Thus, when the students face complicated problems in the small group, the teacher is still available to solve them.
2) The Teams Assisted Individualization (TAI) model in project-based learning for the first-grade students of Science Class at Frater Senior High School Makassar should be considered in choosing learning models in schools and used as a choice for teachers in online learning, especially Mathematics. It can improve learning achievement and student activities in learning Mathematics and positive responses in learning Mathematics.
3) Other researchers should further develop research on the Teams Assisted Individualization (TAI) model in project-based learning, especially Trigonometry Division, to solve educational problems as a whole.

REFERENCES

[1] A. Asriani, "Efektifitas Model Pembelajaran Berbasis Proyek Terintegrasi Stem Pada Pembelajaran Matematika Peserta Didik Kelas XII SMA," 2021, Accessed: Nov. 06, 2021. [Online].Available:http://eprints.unm.ac.id/18956/

[2] R. Y.-P. of P. Education and undefined 2013, "Pengaruh penerapan model project based learning (PBL) terhadap hasil belajar fisika siswa kelas XI IPA SMA Negeri 1 Batipuh Kabupaten Tanah Datar," ejournal.unp.ac.id, Accessed: Nov. 06, 2021. Vol 1, pp 48-54 [Online]. Available: http://ejournal.unp.ac.id/students/index.php/pfis/article/view/490

[3] Nurqiyamah, H. (2021), *Efektifitas Pembelajaran Daring menggunakan Model Kooperatif Tipe Teams Assisted Individualization,* STKIP YAPTI Jeneponto, Paedagogy, Volume 5 No 2

[4] N. Noor, I. M.-J. I. P. (JIP), and undefined 2019, "Pengaruh Model Pembelajaran Kooperatif (Tipe TAI dan TPS) dan Aktivitas Belajar terhadap Hasil Belajar Matematika: Eksperimen pada Kelas X SMK Kosgoro," jurnal.stkipkusumanegara.ac.id, Accessed: Nov. 06, 2021. [Online]. Available: http://jurnal.stkipkusumanegara.ac.id/index.php/jip/article/view/89

[5] Slavin, Robert, (2010), Cooperative Learning Theory Research, and Practice, Secon Edition. Boston. Allyn and Bacon Publisher

[6] Rusman, 2012. Model-Model Pembelajaran, Bandung, Pustaka Pelajar

[7] Sugiyono, 2019, Metodologi Penelitian, Bandung Alfabeta