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COOPERATIVE LEARNING ON THE ACADEMIC ACHIEVEMENT OF MIDDLE-SCHOOL STUDENTS BASED ON LEARNING STYLE

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ABSTRACT

The goals of this study are to (1) see if students who are taught using the Teams Assisted Individualization (TAI) cooperative learning model learn mathematics better than students who are taught using the Student Team Achievement Division (STAD) model, and (2) see if the results of learning mathematics with visual learning styles are better than those with auditory and kinesthetic learning styles. As a result, this sort of study is an experiment. The experimental class I was class VIII students from Public Junior High School 1 North Sinjai. The findings revealed that: (1) students who were taught using the TAI type had better mathematics learning outcomes than students who were taught using the STAD type; (2) the inferential analysis revealed that it was not true that students with visual learning styles had better mathematics learning outcomes than students with auditory and kinesthetic learning styles.

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1. INTRODUCTION

The demands of the times demand that every group teach the nation's children in order to improve education quality through a learning process that promotes students' knowledge in order to compete in the global world. Education is a well-thought-out and deliberate attempt to create a learning environment and process in which students actively develop their capacity for self-control, personality, intelligence, noble character, and skills needed by themselves, society, nation, and state (Agbo & Oyelere, 2019; Junaedi, 2019; Maulida & Ahmad, 2021).

In educational psychology, the main focus is on learning. A change in behavior as a result of experience is referred to as learning (De Houwer et al., 2013; Simbolan, 2014; Nahar, 2016; Lane et al., 2021). The best approach to learning is to engage all five senses in an activity. To put it another way, learning is the process of seeing, reading, mimicking, attempting something new, listening, and following a set of instructions. Learning, according to Suprijono (2011), is the process of acquiring knowledge. Learning is widely accepted as a concept of obtaining information via practice. The teacher acts as if he or she is a teacher who is attempting to impart as much knowledge as possible, and the students enthusiastically accept it.

According to Dimyati (2006), the effects and evidence of learning are changes in people's behavior, such as going from not knowing to knowing and not understanding to comprehend. Students' learning outcomes are inextricably linked to the definition of

instructional objectives by the previous teacher. According to the description above, learning outcomes include all changes in an individual's behavior, which includes all cognitive, emotional, and psychomotor activity. Based on the previously described understandings of learning, learning outcomes, and mathematics, it can be concluded that mathematics learning outcomes are the level of success of students in mastering mathematics subject matter after gaining experience with mathematics at a specific time, which can be directly measured using tests.

According to the findings of an interview with one of the junior high school mathematics teachers in North Sinjai, the average student test results have not met the set standards. These students, he claims, were less enthusiastic about participating in math lessons. In other words, students remained passive throughout the learning process. Furthermore, students are unable to master mathematical thought patterns.

To address these issues, mathematics teachers must make an effort to maximize students' presence in learning activities by actively involving students in activities that require them to interact and collaborate so that learning objectives can be met. As a result, appropriate teaching methods for mathematics must be chosen and implemented. So that students can grasp each piece of information offered and, as a result, improve the teaching and learning process, increase student engagement, and achieve academic achievement. The learning model has an impact on students' mathematical learning outcomes, according to TIMSS statistics (Skryabin et al., 2015; Suarsana et al., 2018; Toropava et al., 2019). A cooperative learning paradigm is one in which students are at the center of their learning, learning together, helping each other, and discussing difficulties together. The cooperative learning model is a teaching style in which students work together in small groups to help one another learn the material (Slavin, 2008). In order to apply information and skills and attain learning objectives, the cooperative learning paradigm stresses cooperation in problem-solving (Sharan, 2010; Lazakidou & Retalis, 2010; Cahyaningsih, 2018).

One of the most basic methods of cooperative learning is STAD (Student Team Achievement Divisions) (Silitonga & Wu, 2019; Sa'adiah et al., 2021). Students are divided into four-person study groups depending on their academic performance, gender, and ethnicity. The five basic components of STAD are class presentations, teams, quizzes, individual progress scores, and team recognition (Slavin, 2008).

In addition to the learning model, learning style is an important factor in determining student learning outcomes in mathematics (Schulze & Bosman, 2018; Pardede et al., 2021). A learning style is a person's method of acquiring and absorbing information in their environment. Learning styles have such an impact on the individual learning process that they have become a material consideration in learning design. There are three types of learning modes: visual, auditory, and kinesthetic (V-A-K). A learning style, according to DePorter & Hernacki (2002) in Quantum Learning, is a combination of how students organize and process information. A learning style is the way a learner processes and retains new information (Klašnja-Milićević et al., 2011; Amin, 2016; Labib et al., 2017; Ardayeni et al., 2019). Learning styles are determined by one's personality development and are influenced by the environment, emotions, social influences, and individual feelings. As a result, teaching can be effective for some students but not for others because their learning styles are different.

A visual learning style is a learning style in which the visuals being studied are visible to the learner (Bajaj & Sharma, 2018; Haryono & Tanujaya, 2018). A portion of them is text-oriented and can be learned through reading. Visual learners are tidy and organized, rapid speakers, good long-term planners and organizers, meticulous to detail, concerned with appearance, good in terms of attire and presentation, and good spellers who can see the real

words in their heads, recalling what they see rather than what they hear (DePorter & Hernacki, 2002).

A person with an auditory learning style learns best by hearing what they are learning (Wahyuni, 2017; Salido & Dasari, 2019). Auditory people learn to use their hearing and become self-sufficient in general. Individuals that excel at auditory learning display the following characteristics (DePorter & Hernacki, 2002): 1) was able to repeat and replicate notes, 2) rhyme and tone of voice, 3) found writing difficult, 4) but was excellent at narrative, and 5) spoke in a patterned pattern.

Being involved, moving, feeling, and exploring are all characteristics of the kinesthetic learning style (Setiawan & Alimah, 2019; Hassan et al., 2021). Slow speech, responding to physical attention, touching people to get their attention, standing close when talking to people, being always physically oriented and moving a lot, early development of large muscles, and learning through manipulation and practice are all behavioral characteristics of people with good kinesthetic learning abilities (DePorter & Hernacki, 2002).

The purpose of this study is to determine whether there is an effect of applying the cooperative learning model and student learning style on their academic achievement by highlighting the role of the teacher's accuracy in selecting the above, namely the appropriate learning model that is applied to each student's learning style.

2. METHOD

This type of study employs a quasi-experimental design. In this investigation, there were two experimental groups. This survey included all public junior high schools in the North Sinjai District. In this investigation, the cluster random sampling method was applied. When a population is dispersed throughout numerous places (clusters), each with similar features, one of the clusters can be selected at random as a sample.

The steps for determining the sample are as follows: Pick two public junior high schools at random from the North Sinjai District's schools. In this study, we chose two public junior high schools in Sinjai Utara: public junior high school 1 and public junior high school 2, each class has been chosen as a sample in this study from the two schools that have been chosen. There are 10 homogenous classrooms in public junior high schools 1 and 7 homogeneous classes in public junior high schools 2, and choose from the two classes that were chosen as examples. The TAI cooperative learning model was used in the first experimental class, while the STAD cooperative learning model was used in the second experimental class.

The study's research design is a Posttest Only Control Group Design (Morris, 2008; Bloomfield & Fisher, 2019). We used (1) learning style modality assessments, (2) learning outcomes tests, and (3) student activity observation sheets to collect data for this study. To evaluate the data using descriptive and inferential analysis.

3. RESULTS AND DISCUSSION

3.1. Inferential Analysis Results

The results of inferential statistical analysis are intended to answer the research hypotheses that have been formulated as well as the problem formulation. Prior to performing the inferential statistical analysis, the requirements test, namely the homogeneity test, was performed, and the hypothesis was then tested.

The hypotheses to be tested are as follows:
H0: the variance in all populations is the same.
H1: Not all populations have the same variance.

The calculation for the homogeneity test in table 1 is as follows.

Table 1. The similarity of Variance of Academic Achievement

Levene Statistic	df1	df2	sig.
1,044	1	63	0,311

Using the value of = 0.05, we obtained p = 0.311 from Table 1. Then, because the p-value is greater than 0.05. This suggests that there is no difference in students' skills between classes taught using the TAI type of cooperative learning model and classes taught using the STAD type of cooperative learning model, or in other words, the students' abilities are the same in both classrooms.

3.2. Statistical hypothesis test

For the purposes of testing the hypothesis, the statistical hypothesis has been formulated, namely: the mathematics learning outcomes of students who are taught through the application of the TAI-type cooperative learning mode are better than those taught through the application of the STAD-type cooperative learning model.

$$\boldsymbol{H_0: \mu_1 \leq \mu_2 \text{ vs } H_1: \mu_1 > \mu_2}$$

The following are the findings of the Independent Samples Test statistical test in table 2.

Table 2. Independent Samples Test

		Levene's Test for Equality of Variances		t-test for Equality of Means						
		F	Sig.	T	df	Sig. (2-tailed)	Mean Difference	Std. Error Difference	95% Confidence Interval of the Difference	
									Lower	Upper
Value	Equal variances assumed	1,044	0,311	2,012	63	0,048	7,9649	3,95839	0,05468	15,87511
	Equal variances not assumed			2	59,982	0,05	7,9649	3,98285	-0,00204	15,93183

Based on Table 2, if the p value $p = 0{,}048 < 0{,}05 = \alpha$. This means that there is a significant difference between the TAI type and the STAD type of cooperative learning model.

Table 3. Multiple Comparisons

(I) Group	(J) Group	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
A1B1	A1B2	-2,51667	6,16482	0,998	-20,6747	15,6414
	A1B3	1,25714	7,28604	1	-20,2033	22,7176
	A2B1	3,9625	5,72071	0,982	-12,8874	20,8124
	A2B2	5,73333	6,71141	0,956	-14,0346	25,5013
	A2B3	18,73333	7,68888	0,161	-3,9137	41,3804
A1B2	A1B1	2,51667	6,16482	0,998	-15,6414	20,6747
	A1B3	3,77381	7,57028	0,996	-18,5239	26,0715
	A2B1	6,47917	6,0786	0,893	-11,4249	24,3832
	A2B2	8,25	7,01896	0,847	-12,4238	28,9238
	A2B3	21,25	7,95875	0,097	-2,1919	44,6919
A1B3	A1B1	-1,25714	7,28604	1	-22,7176	20,2033
	A1B2	-3,77381	7,57028	0,996	-26,0715	18,5239
	A2B1	2,70536	7,21323	0,999	-18,5407	23,9514
	A2B2	4,47619	8,02167	0,993	-19,151	28,1034
	A2B3	17,47619	8,85568	0,37	-8,6076	43,5599
A2B1	A1B1	-3,9625	5,72071	0,982	-20,8124	12,8874
	A1B2	-6,47917	6,0786	0,893	-24,3832	11,4249
	A1B3	-2,70536	7,21323	0,999	-23,9514	18,5407
	A2B2	1,77083	6,63229	1	-17,7641	21,3058
	A2B3	14,77083	7,61992	0,39	-7,6731	37,2148
A2B2	A1B1	-5,73333	6,71141	0,956	-25,5013	14,0346
	A1B2	-8,25	7,01896	0,847	-28,9238	12,4238
	A1B3	-4,47619	8,02167	0,993	-28,1034	19,151
	A2B1	-1,77083	6,63229	1	-21,3058	17,7641
	A2B3	13	8,38926	0,634	-11,7099	37,7099
A2B3	A1B1	-18,73333	7,68888	0,161	-41,3804	3,9137
	A1B2	-21,25	7,95875	0,097	-44,6919	2,1919
	A1B3	-17,47619	8,85568	0,37	-43,5599	8,6076
	A2B1	-14,77083	7,61992	0,39	-37,2148	7,6731
	A2B2	-13	8,38926	0,634	-37,7099	11,7099

Table 4. Anova Results

ANOVA					
Value					
	Sum of Squares	Df	Mean Square	F	Sig.
Between Groups	628,566	2	314,283	1,188	,312
Within Groups	16406,972	62	264,629		
Total	17035,538	64			

Based on the aforementioned ANOVA results, it may be concluded that sig. 0.312, then H0, is acceptable. This suggests that it is not true that children with visual learning styles perform better in mathematics.

3.3. Discussion

According to the findings, the students' mathematical learning outcomes were accomplished and effective. Furthermore, with an average score of 82.03, pupils have a good degree of mathematics learning outcomes. The adoption of the conventional TAI-type cooperative learning model resulted in the completion of students' mathematical learning outcomes. A previous study by Nurzakiaty (2015), Rahman et al. (2016), Syam et al. (2020), Tristanti & Hidayati (2020), and Nurmala et al. (2021) backs up these findings.

Furthermore, the study's findings suggest that children who are taught mathematics using the Student Teams Achievement Individualization (STAD) cooperative learning approach are not achieving their full potential. Students have a medium level of mathematics learning outcomes, with an average score of 74.06. Classically, the completion of students' mathematical learning outcomes who are taught using the STAD kind of cooperative learning paradigm has not been realized.

Another research demonstrates that kids with visual learning styles do not do better in mathematics than students with auditory and kinesthetic learning styles. Ozerem and Akkoyunlu (2015), Willingham et al. (2015), and Azis and Leatemia (2021) all corroborate this.

As a result of these discoveries, every instructor should invite their students to recognize and understand their own learning styles, as well as teach them how to empower their learning styles to the greatest extent feasible. The teacher's teaching style must be adjusted to the student's learning type. Teachers must employ a variety of teaching approaches in order to accommodate each student's learning style. Furthermore, the teacher's comprehension of student learning styles is anticipated to allow students to absorb information or comprehend a lesson in their own unique way, depending on their learning style.

4. CONCLUSION

Some conclusions from the findings of this study: The achievement of mathematics learning outcomes by students who are taught using a cooperative learning methodology of the kind Team Assisted Individualization (TAI).

The accomplishment of mathematical achievements by students who are taught using a cooperative learning paradigm called Student Teams Achievement Individualization (STAD). The average value of 74.06 indicates that pupils have a medium level of mathematics learning results in general.

Inferential analysis results show that students with visual learning styles do not outperform students with auditory and kinesthetic learning styles in mathematics. As a suggestion, future researchers should be aware of the limitations of this study so that future research can improve the study's findings and make a valuable contribution to the world of education, particularly in the subject of mathematics.

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