

THE EFFECT MODEL COOPERATIVE LEARNING AND LINGUISTIC INTELLIGENCE FOR SCIENCE LEARNING OUTCOME IN CLASS V STUDENT OF SD PELANGI MEDAN

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Abstract

This study aims to determine: (1) the learning outcomes of science taught by the time token type of cooperative learning model are higher than the learning outcomes of science taught by the think pair share type of cooperative learning model; (2) the learning outcomes of science students who have a high level of linguistic intelligence are better than those of students who have a low level of linguistic intelligence; and (3) the interaction between the use of cooperative learning models and linguistic intelligence on science learning outcomes. The population in this study were students in grades VA and VB at Pelangi Medan private elementary school, totaling 2 classes. The sample in this study was determined randomly using a non-probability sampling technique with the type of convenience sampling, with 26 students in each class. The research method uses quasi-experimental research (quasi-experimental). The instruments used in this research are the science learning outcomes test and linguistic intelligence scale of linguistic intelligence. Analysis of the data used is 2×2 factorial ANOVA. Based on the research results obtained: (1) The learning outcomes of students in the cooperative learning model class with the time token type are higher than the students' learning outcomes in the cooperative learning model class with the think pair share type with $F_{count} > F_{table}$ (10,765). > 4.04); (2) Science learning outcomes of students who have high linguistic intelligence are higher in science

learning outcomes of students who have low linguistic intelligence with $F_{count} > F_{table}$ ($14.994 > 4.04$); and (3) there is no interaction between learning models and linguistic intelligence on science learning outcomes with $F_{count} < F_{table}$ ($0.079 < 4.04$). The results are expected to provide information for teachers and schools to use the time token type of cooperative learning model to improve students' short story appreciation skills. In addition, it is necessary to improve students' linguistic intelligence in classroom learning.

Keywords: *Cooperative Learning Model, Linguistic Intelligence, Learning Outcomes*

A. Introduction

Education in its implementation has been known as an effort in the form of guidance to students to lead children in a better direction. To achieve this, the principle of education must be oriented to the development of all aspects of the potential of students, such as cognitive, affective, and psychomotor aspects.

Many efforts can be made to improve the quality of education, including curriculum renewal, improving the quality of teachers, procurement of books and learning facilities. Rusman (2010) states that learning is essentially a process of interaction with all situations around the individual.

Formally, elementary school is included in the category of primary education. Basic education is the basic foundation of all subsequent school levels. Elementary school is the initial basic education before entering secondary primary education, namely junior high school. Vygotsky believes that social interaction with other friends spurs the formation of new ideas and enriches the intellectual development of students (Ibrahim & Nur in Rusman, 2014). Therefore, every cognitive process in children needs to be considered starting from the most

straightforward stage to the complex stage so that the child's cognitive abilities can develop optimally in learning.

The science concept in elementary schools is integrated because it has not been separated separately, such as physics, biology, and chemistry. Science learning in elementary schools is intended to provide opportunities for students to cultivate natural curiosity, develop the ability to ask questions and seek answers to natural phenomena based on evidence, and develop scientific ways of thinking. Besides, the teacher does not carry out learning activities by focusing on student learning activities. In the end, this kind of situation causes learning activities to only focus on delivering material and textbooks. Students are more likely to be passive recipients who only listen to the teacher's explanation.

Such a situation can be seen in science learning activities at SD Pelangi Medan. Based on observations made in class on science learning activities, students' ability to ask questions and express their opinions is still low.

Table 1. Recapitulation of Class V IPA UAS Results Pelangi Medan Private Elementary School

No	School year	Score Lowest	Score Highest	Percentage Completeness
1	2015/2016	50	89	76%
2	2016/2017	43	87	74.6%
3	2017/2018	45	90	78.2%

Source: Class V teacher of SD Pelangi Medan, 2019, data processed

The learning model is structured based on various principles and theories for its development. Experts develop learning models based on educational principles, psychological, sociological, psychiatric, systems analysis, or other theories. Several learning models have been widely applied in learning to achieve success in the goals that have been set.

However, considering the various kinds of goals to be achieved, the varied characteristics of students, different learning environments, etc., it is impossible to make a good learning model for all types of learning activities.

The cooperative learning model (cooperative learning) is one of the learning models that can improve student learning outcomes. The cooperative learning model is a learning model that is arranged to allow students to work together in groups. The group learning model is a series of learning activities carried out by students in specific groups to achieve the formulated learning objectives. According to Slavin (2007), cooperative learning encourages students to interact actively and positively in groups. This allows the exchange of opinions among students. In this cooperative learning model, the teacher acts more as a facilitator who functions as a connecting bridge towards higher understanding, and the teacher does not only provide knowledge to students,

The time token cooperative learning model is one type of cooperative learning model. The time token cooperative learning model is expected to increase the active participation of all students to improve student learning outcomes. The time token cooperative learning model aims to overcome the barriers to equal opportunity that often characterize group work. According to Arends (2008), if teachers have cooperative learning groups with some people dominating the learning and some people being shy and never saying anything, time tokens can help distribute participation more evenly. In this model, students are allowed to express their opinions by paying attention to speaking ethics. Students are given an inducement to explore their thinking skills.

Several studies have been conducted in the application of the time token cooperative learning model, including research conducted by Rurua [946]

(2017), showed that there was a significant effect of the time token learning model on student motivation and learning outcomes about cell biology as well as a positive relationship between motivation and student learning outcomes. The biology education study program at the University of Sintuwu Maroso. Research conducted by Kurniati (2015) on SMKN 1 Jatiasih shows that students who study using the time token method are higher than students who study using the varied lecture method.

B. Method

This research was conducted at the private elementary school Pelangi Medan, which is located at Jalan Bhayangkara No. 417, Indra Kasih sub-district, Medan Tembung sub-district, Medan city. The research was carried out in the even semester of the 2019-2020 academic year, from July to August 2019. The classes selected were class VA and class VB consisting of 2 classes with 52 students. Each population is assumed to have the same characteristics, where each class does not have students who have stayed in class, the average age of students is not much different, all students do not take additional lessons and qualifications.

Technique The sampling used in this study used a non-probability sampling design with a convenience sampling type. This study uses a quasi-experimental research method by conducting experiments in classes that are already available as they are, without changing the classroom situation and learning schedule. The research design used in this study used a 2×2 factorial design.

The research variables in this study consisted of independent variables and dependent variables. The independent variables are the cooperative learning model and linguistic intelligence. The cooperative learning model is distinguished into the time token cooperative learning

model and the think pair share learning model, while linguistic intelligence is grouped into high linguistic intelligence and low linguistic intelligence. While the dependent variable used is science learning outcomes.

Variables that can be controlled carefully during treatment are only learning models. In contrast, other variables that affect the dependent variable, namely learning outcomes, will be controlled for their effects through external validity and internal validity. given and to gain confidence that the chosen design is good enough to be used in hypothesis testing so that the research obtained can be generalized to the existing population. For this reason, it is necessary to control external and internal validity.

Data Collection Techniques

The data collection used in this study came from data taken directly by researchers in the field. The technique used in this study uses a test for science learning outcomes and a psychological scale of linguistic intelligence. The learning outcome test is in multiple-choice questions with four answer choices in science subjects for fifth-grade elementary school. Meanwhile, to classify students on the level of linguistic intelligence, it is carried out using a linguistic intelligence scale adopted from Howard Gardner's theory guided by the indicators developed by Armstrong (2009) and Lwin (2008).

Data Collection Instruments

The learning outcomes test measures the mastery and ability achieved by a person in various abilities. A learning outcome test was used to obtain data on students' science learning outcomes. The learning outcomes test that is often used is the multiple-choice test. The learning outcomes test is in the form of test items arranged based on the syllabus and the assessment system of the science subjects who receive

treatment. The number of items is determined by 25 items and is estimated to represent and capture students' knowledge in the topics given treatment. The form of statements or multiple-choice test questions is arranged with four answer choices, namely A, B, C, and D. Each correct answer is given a score. One and the wrong answer is given a score of zero. The aspect of being assessed is the cognitive area, namely memory (C1),

Trial of Research Instruments

Test try the test carried out so that the data obtained from the research results are valid and reliable. Before arriving at the validity and reliability, a test must first be carried out on the test's level of difficulty and distinguishing power. The instruments used in this research are science learning outcomes instruments and linguistic intelligence scale instruments. The study tested both instruments, namely the science learning outcome instrument and the linguistic intelligence scale instrument. The science learning outcome instrument is to measure the cognitive aspects of students, while the linguistic intelligence scale instrument is to see the level of students' linguistic intelligence.

Research Instrument Trial Results

- Validity test
- Reliability Test
- Test Item Difficulty Test
- Test Item Differential Power Test

Data Analysis Techniques

- Technical data analysis is carried out in two ways, namely:
- Descriptive Technique
 - Inferential Technique

C. Finding and Discussion

1. Result

the results of the overall description are stated in the form of a table, then the data obtained as presented in table 2.

Table 2. Data Summary of Science Learning Calculation Results

Cooperative learning model Time token type cooperative learning model (A1)	Think pair share (A2) cooperative learning model	Total
Linguistic intelligence		
Height (B1)	n 14	n 27
	X 281	X 515
	X2 5663	X2 9921
	$\bar{X}$ 20.071	$\bar{X}$ 38.071
	s 1,280	s 3,161
Low (B2)	n 12	n 25
	X 212	X 428
	X2 3792	X2 7424
	$\bar{X}$ 17,667	$\bar{X}$ 34,282
	s 1,972	s 3,792
Total	n 26	n 52
	X 493	X 943
	X2 9455	X2 17345
	$\bar{X}$ 37,738	$\bar{X}$ 34,615

Information :

n = sample

$\bar{X}$ = average

s = standard deviation

X = Total score

X2 = sum of the squares of the score

Testing Data Analysis Requirements

Data Normality Test

[950]

Table 3. Summary of Data Normality Calculation Results

Group	n	Count	L_{table}	Information
The ability of science learning outcomes in the time token type cooperative learning model class (A1)	26	0.119	0.173	Normal
The ability of science learning outcomes in the cooperative learning model class think pair share (A2)	26	0.104	0.173	Normal
High linguistic intelligence (B1)	27	0.126	0.173	Normal
Low linguistic intelligence (B2)	25	0.094	0.173	Normal
Science learning outcomes with high linguistic intelligence in the time token type cooperative learning model class (A1B1)	14	0.163	0.227	Normal
Science learning outcomes with low linguistic intelligence in the time token type cooperative learning model class (A1B2)	12	0.147	0.242	Normal
Science learning outcomes with high linguistic intelligence in the cooperative learning model class think pair share (A2B1)	13	0.116	0.234	Normal
Science learning outcomes with low linguistic intelligence in the think pair share (A2B2) cooperative learning model class	13	0.108	0.234	Normal

Homogeneity Test

Table 4. Results of the Homogeneity of the Variance of Learning Outcomes in the Treatment Group

Group	variance (s ²)	variance Combined (s ²)	Price B	χ^2_{count}	χ^2_{table}	Conclusion
A1B1	1,638					

A1B2	3,888					
A2B1	3,538	3.048	23,232	2.66	7.81	Homogeneous
A2B2	3.312					

Research Hypothesis Testing

Table 5. summary analysis of Variance of Science Learning Outcomes

Source Variance	dk	JK	RJK	F _{count}	F _{table} ($\alpha=5\%$)	Note:
Learning Model (A)	1	35.585	35.585	10,765	4.04	Significant
Linguistic intelligence (B)	1	49,566	49,566	14,994	4.04	Significant
Interaction (AB)	1	0.262	0.262	0.079	4.04	No
Error	48	158.67	3,306	-	-	-
Total	51	244,083	-	-	-	-

Based on these data, it can be concluded that there is no interaction between cooperative learning models and linguistic intelligence that affects science learning outcomes.

1. Difference learning outcomes of class science cooperative learning model time token type with class science learning outcomes think pair share type cooperative learning model

The research hypothesis proposed is that the science learning outcomes of cooperative learning model class students with the time token type are higher than the scientific learning outcomes of students in the think pair share cooperative learning model class.

2. Difference high linguistic intelligence students' science learning outcomes with low linguistic intelligence students' science learning outcomes

The research hypothesis proposed is that the science learning outcomes of students with high linguistic intelligence are higher than those of students with low linguistic intelligence.

3. The interaction between cooperative learning models and linguistic intelligence on science learning outcomes

The research hypothesis states no interaction between cooperative learning models and linguistic intelligence on science learning outcomes.

The interaction of cooperative learning models and linguistic intelligence on science learning outcomes can be described in Figure 4.9 below.

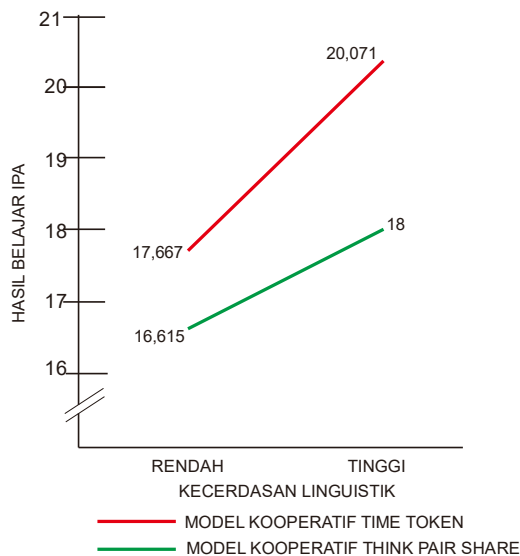


Figure 1. The Interaction Line of Cooperative Learning Models and Linguistic Intelligence on Science Learning Outcomes

From Figure 1 it can be seen that there is no interaction between cooperative learning models and linguistic intelligence on science learning outcomes, which is indicated by the absence of a point of intersection between the high and low linguistic intelligence lines of each treatment class.

2. Discussion

Based on the results obtained in the discussion of research hypothesis testing, it can be stated:

Science learning outcomes of cooperative learning model class students with the time token type are higher than the science learning outcomes of students in the think pair share cooperative learning model class.

The time token cooperative learning model can improve students' science learning outcomes because the time token cooperative learning model requires all students to be actively involved during the learning process. According to Sobari (2006), the time token model is a learning model used to speak actively. In discussion learning, time tokens are used to ask questions actively or express their opinions by limiting their speaking time so that students are expected to get the opportunity to speak reasonably.

The think pair share cooperative learning model is a group learning model that involves students actively learning through thinking, responding, and helping each other, consisting of two people who work together to solve problems. Slavin (2010) stated that students sit in pairs with their respective teams when teachers deliver class lessons. Suprijono (in Trianto, 2010) mentions that think pair share has the meaning as the name suggests, "thinking," learning that begins with the teacher asking questions or issues related to learning for students to think about. Next is "pairing," at this stage, the teacher asks students to pair up, allowing the pairs to discuss. Then the last stage is "sharing," at this stage, the results of the discussion in each pair are discussed with partners throughout the class. In this activity, it is hoped that questions and answers will

encourage the construction of knowledge in an integrative way. So students can find the structure of the knowledge they learn.

With the different characteristics of the two cooperative learning models above, there are differences in the science learning outcomes of students taught using the time token cooperative learning model with students who are taught the think pair share learning model. This study indicates that the time token cooperative learning model provides higher science learning outcomes than the think pair share cooperative learning model.

The science learning outcomes of students with high linguistic intelligence are higher than the science learning outcomes of students with low linguistic intelligence

The results showed that students with high linguistic intelligence were higher than the science learning outcomes of students with low linguistic intelligence. The results of this study support the research conducted by Ibnian and Ala' (2013) that intelligence can increase students' motivation, and learning abilities can be determined by differences in intelligence in students. Students who have good intelligence will better influence student learning abilities and vice versa.

Based on Howard Gardner's theory, linguistic intelligence is multiple intelligences. According to Gardner, linguistic intelligence is the ability to use and process words effectively orally and in writing. According to Armstrong (2009), linguistic intelligence includes manipulating grammar or language structure, phonology or language sounds, semantics or language meaning, and pragmatic dimensions or practical use. The use of language includes, among others, retrorika (use of language to influence others to perform specific actions), memorization (use of language to

remember information), explanation (use of language to provide information), and metalanguage (use of language to discuss language itself). The level of students' linguistic ability is not the same as one another, which significantly affects student learning outcomes.

Students with high linguistic intelligence can memorize (use of language to remember information) and explain (use of language to provide information). Thus, students with high linguistic intelligence are easier to learn science learning materials given by the teacher. This is due to students' ability who tend to have interpretations and strong memory, both for new terms and things that are detailed. Meanwhile, students with low linguistic intelligence have limitations in memorizing (use of language to remember information) and explanation (use of language to provide information), so it will not be easy to express their ideas in learning. it affects the learning outcomes of science

The interaction between cooperative learning models and linguistic intelligence on science learning outcomes

Based on the results of hypothesis testing regarding the interaction between cooperative learning models and linguistic intelligence on science learning outcomes, it is known that there is no interaction between cooperative learning models and linguistic intelligence on science learning outcomes for class V SD Pelangi Medan. This shows that the differences in students' science learning outcomes at each level of students' linguistic intelligence follow the characteristics that exist in the effect of the cooperative learning model. In other words, the differences in students' science learning outcomes in each category of linguistic intelligence are consistent with each learning model. This study supports the research results conducted by Astridewi (2018), where there

[956]

is no interaction between cooperative learning models and grouping student abilities on student self-efficacy.

D. Conclusion

Based on the research results that have been described in Chapter IV, it can be concluded:

1. Learning science in the cooperative learning model class with the time token type is higher than the science learning outcome in the think pair share cooperative learning model class. The average value of science learning outcomes in the cooperative learning model class with the time token type is higher than the science learning outcomes in the think pair share cooperative learning model class.
2. The science learning outcomes of students with high linguistic intelligence are higher than students with low linguistic intelligence. The average value of science learning outcomes of students with high linguistic intelligence is higher than the average value of students with low linguistic intelligence.
3. There is no interaction between cooperative learning models and linguistic intelligence on students' science learning outcomes. Differences in students' science learning outcomes in each category of linguistic intelligence are consistent with each learning model

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