

Article A Study of Cooperative Learning Model with Process Skills in Elementary School

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ABSTRACT

The purpose of this study was to determine student responses to process skills on jigsaw and STAD learning models for mathematics subjects. This research was conducted at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district. The method in this research is comparative quantitative data analysis, where comparative is research that compares two or more variables. The result of this research is that there is a hypothesis test result (T) which shows that there are differences in the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. Furthermore, it was found that there were differences in the learning model of student team achievement divisions (STAD) at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district regarding Mathematics. So it can be concluded that there is a comparison between 2 elementary schools on process skills in the jigsaw and STAD learning models on mathematics subjects

1. Introduction

Indonesia always evaluates and tries to improve its education system to suit the needs of education itself. Humans need education so that it can be useful for society and the nation, thereby producing an intellectual generation to increase knowledge (Pelullo & Giuseppe, 2018; Darmaji et al., 2019; Yanti & Yusliani, 2020). Education can be said to be the key to the success of students because with education, students can be more literate with the outside world and are the spearhead in developing resources and changing the behavior of each individual (Utama et al., 2018; Darmaji et al., 2018; Tanti et al., 2020). education to improve their quality, by Improving educational processes and outcomes must be done through a focus on teaching (Kalaw, 2017; Şemin, 2019; Tanti et al., 2020). This is what causes the renewal of the teaching curriculum.

The curriculum itself is a set of subjects and educational programs provided by education providers. The curriculum is the entire program that is planned, the learning principles used in Indonesia are the latest revised 2013 curriculum where in addition to the vision and mission, learning outcomes must also be displayed in a learning model by integrating literacy skills, knowledge skills, skills and attitudes, and mastery of technology (Chalim, 2018; Handayani, 2018; Suryaman et al., 2020). These skills cover four aspects of education which include learning to know, learning to do, learning to be and learning to live together (Wegawati et al., 2016; Gelen, 2018; Gürsoy, 2021). Therefore, teaching skills are needed for a teacher to foster a desire to learn for students.

This learning skill is a pattern in teaching so that conducive learning can be carried out. Based on the school's observations of students' problem-solving skills using the scientific method for future learning (Hartini, 2017; Setiawan, 2019; Chan et al., 2020). Monotonous learning will be difficult to accept, this causes students to be lazy to do assignments because of the applied education system (Mansouri & Moumine, 2017; Sari et al., 2017; Astalini et al., 2018). Learning can be carried out effectively by considering the presentation of literacy enrichment teaching according to the characteristics of students (Rochman et al., 2017; Hartini et al., 2018; Laila Puspita, 2019). So the learning process must increase the student's desire to learn.

Learning process activities are designed by educators to help students learn new abilities or value. If the teacher is wrong in constructing learning activities, it can reduce student interest in learning (Apriyani, 2017; Kurniawan et al., 2019; Adom et al., 2020). Interest in learning is a form of student interest in the lesson to be studied by having 2 cognitive and affective aspects in fostering interest in learning (Sari et al., 2017; Saputro & Amir, 2018). Given that learning integration is important, it can offer learning according to the interests of students, therefore students can apply what they learn (Setiawan et al., 2017; Asrizal et al., 2018; Mutakinati et al., 2018). Many lessons are taught in schools as a means of education, one of which is learning mathematics.

Mathematics is a learning science that discusses magnitude, structure, space and change, both in elementary school and at the next level. Primary school mathematics learning can hone students' mathematical abilities to think logically, analytically, critically and systematically by improving the learning process proses (Kenedi, 2019; Nurlaily et al., 2019; Saleh et al., 2018). This states that participation and soft skills as well as a good point of view can be used to solve math problems (Hendriana et al., 2018; Ambussaidi & Yang, 2019; Lin et al., 2020). This tendency is a problem solving technique in determining mathematical concepts using concrete objects (Surya et al., 2017; Saleh et al., 2018; Nuryadi et al., 2020). Therefore, the learning model used must be able to create a good learning atmosphere.

Talking about learning models where jigsaw and Student Team Achievement Divisions (STAD) are learning models that can be used. The jigsaw method is a method in which students are responsible for analyzing cooperative learning by grouping students (Wibawa & Suarjana, 2019; Santos et al., 2019; Booker, 2021). The jigsaw learning model further enhances students' general knowledge and basic skills by doing better tasks. Meanwhile, Student Team Achievement Divisions (STAD) is a simple cooperative learning model. In addition, the STAD learning model improves communication skills as well as a potential learning model (Rohika, 2017; Kusumawardani et al., 2018; Putra et al., 2018).

In the learning models that exist in various journals, we can review the jigsaw learning model and student team achievement divisions (STAD). Several studies state that jigsaw is one type where students are assigned to exchange ideas (Widayanti, 2019; Baken et al., 2020; Chang & Benson, 2020). The function of the jigsaw itself is to make it easier to create tasks. Then we can also review the Student Team Achievement Divisions (STAD) learning model from several journals. According to (Sadeghi & Ghaderi, 2018; Kougiali et al., 2020), stated that in research student team achievement divisions (STAD) is the simplest method in the learning process. There are a lot of studies on Jigsaw and STAD, but from previous studies there has been no discussion on the comparison of the two learning models and there is no relevant use in research that is only done in general. Therefore, the purpose of this study was to make a comparison between process skills in the jigsaw and STAD learning models using indicators.

2. Method

This study uses a type of comparative quantitative research. The design of a procedure in quantitative research in which you administer a questionnaire to a small group of people (called a sample) to identify trends in attitudes, opinions, behaviors, or characteristics of a large group of people (Creswell, 2013). The sample in this study was 144 students from SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district. The sampling technique is purvosive sampling. Purposive sampling is a type of sampling in which a research more a less handpicks case (Stommel & Wills, 2004). The reason for taking this technique is because not all samples have criteria that match the phenomenon being studied. The most important thing in sampling must consider the analysis of the sample. The sample taken is class VII A and VII B consisting of 80 women and 64 men.

There are 3 instruments in this study, namely Process Skills for Science, the Jigsaw Learning model and the learning model Student Team Achievement Divisions (STAD). The assessment instrument is one of the latest experimental assessment instruments in the field of assessment (Caltagirone et al., 2005; Purwanti et al., 2020). There are 10 process skills items on the questions in the two valid learning models on this instrument using a Likert scale 4. The scale consists of 4 points for process skills in the model, namely 1 (very bad), 2 (not good), 3 (good), and 4 (very good). Each statement is representative of each indicator of process skills and learning models. The lattice of the process skills questionaire instrument used in this study are as table 1.

Variable	Indicator	Statement Item No.	
Single data material	Communication	4,5,6,7	
math process skills	Measure	13,14,15	
_	Arrange tables	25, 26, 27	
Number of	Number of Statements		

 Table 1. The Instrument Grid of Process Skills Observation Sheet on Single Data Mathematics

 Material for Elementary School Students.

The categories of process skills used in this study are as table 2.

	Indicator Interval					
Category	BASI	INTEGRATION				
	classification	measure	Arrange tables			
Very Not Good	5.0-8.8	3.0-5.3	3.0-5.3			
Not good	8.9-12.7	5.4-7.6	5.4-7.6			
Good	12.8-16.2	7.7-10	7.7-10			
Very good	16.3-20.3	10.1-12.4	10.1-12.4			

Table 2. Category Student Science Process Skills

This research was conducted by comparative quantitative data analysis. Where comparative is research that compares two or more variables by using this type of comparative research to determine the relationship or the type of variables used. An overview or presentation of large amounts of data that includes the mean, mode, median, max. min, and standard deviation are descriptive statistics (Pramesti.2018; Santoso, 2019). Therefore, differential statistics are used with assumption tests consisting of tests of normality, linearity, and homogeneity. As well as hypothesis testing T test and correlation. The normality test aims to determine whether a data can be said to be normal or not, while the homogeneous test aims to determine whether a data of the two samples is homogeneous or not. The first step in this research is to determine the normality and homogeneity of a data using normality test and homogeneity test.

The research method is basically a scientific way to obtain data with specific purposes and uses, one of which is to clarify various analytical processes using real calculation methods (Suharsaputra, 2012). Next, identify the results for follow-up. At the data collection stage, questionnaires were given to 144 students in two schools, namely SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district. From this data, data analysis is then carried out, namely data coding, filtering appropriate data and analyzing the data.

In collecting data in the form of attitude activities carried out using descriptive statistics based on the categories given by the researcher. The data needed in this research were collected and obtained from SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district. There is also the procedure for collecting data in this research in accordance with the figure 1.



Figure 1. Research Procedure

3. Results and Discussion Results

The results of this study discuss descriptive statistical tests of variables, test assumptions which are divided into normality, homogeneity and linearity, then hypothesis testing (T test) the jigsaw process skills learning model and Student team achievement divisions (STAD) model students in Mathematics. Based on the results from the table 3, it can be seen that the classification indicator category for the jigsaw learning model is the most dominant for students at SD Negeri 04/I Sungai Ruan Ilir, which can be seen from the percentage of good scores.

Student response	se	interval	F	Category	mean	median	Min	Max
		3.0-5.3	0	Not very good	2.29	3.0	2.0	4.0
	VA	5.4-7.6	11	Not good				
SD Negeri	, , ,	7.7-10	17	Good				
04/I Sungai		10.1-12.4	8	Very good				
Ruan Ilir		3.0-5.3	0	Not very good	3.02	3	2	4
	VB	5.4-7.6	9	Not good				
	٧D	7.7-10	17	Good				
		10.1-12.4	10	Very good				
SD Negeri	VA	3.0-5.3	2	Not very good	2.75	3.0	1.0	4.0
52/I Kilangan		5.4-7.6	11	Not good				

Table 3. Description of the Classification Indicators of the Jigsaw Learning Model

II		7.7-10	18	Good	_			
		10.1-12.4	6	Very good				
		3.0-5.3	0	Not very good	2.94	3.0	2.0	4.0
	VD	5.4-7.6	8	Not good				
	VB	7.7-10	23	Good				
		10.1-12.4	6	Very good				

The description of the classification indicators for the STAD learning model in elementary schools can be seen in table 4.

Student resp	ponse	Interval	F	%	Category	mean	median	Min	Max
		5.0-8.8	2	5.4	Not very good	2.29	3.0	2.0	4.0
	VA	8.9-12.7	11	29.7	Not good				
SD Negeri	-	12.8-16.2	18	48.6	Good				
04/I	-	16.3-20.3	6	16.2	Very good				
Sungai		5.0-8.8	0	0	Not very good	3.02	3.0	2.0	4.0
Ruan Ilir	VB -	8.9-12.7	8	21.6	Not good				
	٧D	12.8-16.2	23	62.2	Good				
		16.3-20.3	6	16.2	Very good				
		5.0-8.8	2	5.4	Not very good	2.75	3.0	1.0	4.0
	VA	8.9-12.7	11	29.7	Not good				
SD Negeri	-	12.8-16.2	18	48.6	Good				
52/I	-	16.3-20.3	6	16.2	Very good				
Kilangan		5.0-8.8	0	0	Not very good	2.94	3.0	2.0	4.0
II	VB -	8.9-12.7	8	21.6	Not good				
	v D	12.8-16.2	23	62.2	Good				
		16.3-20.3	6	16.2	Very good				

Table 4. Description of The Classification Indicators for The STAD Learning Model

Based on the results of the table 4, it can be seen that the indicator category composes a table on the STAD learning model in elementary schools, the most dominant being students of SD Negeri 04/I Sungai Ruan Ilir can be seen from the percentage of good scores

The data is normally distributed as seen from the significance value, if the significance value is > 0.05. The following are the results of the normality test shown in the table. The normality test of the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district is described in the following table 5.

 Table 5. Normality Test of The Jigsaw Learning Model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II In Batanghari District

Tests of	Normality		
CLASS	Kolmog	orov-Smi	rnova
CLASS	Statistics	df	Sig.

Jigsaw_SDN04	V A	.077	36	.300*
J1g5aw_5D1104	V B	.091	36	.300*
Basar SDN52	V A	.093	36	.300*
Jigsaw_SDN52	V B	.091	36	.300*

Based on the results of the table 5, it can be concluded that the data is normally distributed, the normality test is obtained with the Kolmogorov-Smoniv test, the significance value is 0.300 > 0.05 and 0.148 > 0.05.

As for the normality test of the learning model student team achievement divisions (STAD) in SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district are described in the following table 6.

 Table 6. Normality Test of Learning Model Student Team Achievement Divisions (STAD) In SD

 Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II In Batanghari District

Tests of Normality						
	CLASS	Kolmogorov-Smirnova				
		Statistics	df	Sig.		
STAD_SDN0	V A	.077	36	.200*		
4	V B	.091	36	.200*		
STAD_SDN5	V A	.093	36	.200*		
2	V B	.091	36	.200*		

Based on the results of the table 6, it can be concluded that the data is normally distributed, the normality test is obtained with the Kolmogorov-Smoniv test, the significance value is 0.200> 0.05 and 0.248> 0.05.

This test is carried out in order to find out whether the x and y data are homohen or not. The requirement in this test is that if the significance value is > 0.05, it can be said that the x and y data are homogeneous (same). If the significance value is < 0.05 then the data is not homogeneous (not the same). The results obtained are shown in the table. The homogeneity test of the learning model jigsaw in SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district are described in the following table 7.

Table 7. Test The Homogeneity of The Learning Model Jigsaw in SD Negeri 04/I Sungai Ruan Ilir
and SD Negeri 52/I Kilangan II In Batanghari District

	Test of Homogeneity of Variances						
		Levene Statistics	df1	df2	Sig.		
T'	Based on Mean	2,767	1	66	.105		
Jigsaw	Based on Median	2,767	1	66	.106		
learning model	Based on Median and with adjusted df	.146	1	61,991	.446		
mouer	Based on trimmed mean	.132	1	66	.745		

Based on the table, it can be concluded that the variance of the two variables is the same or homogeneous which is obtained is a significance value of 0.745 which has met the requirements > 0.05.

The homogeneity test of the learning model student team achievement divisions (STAD) in SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district are described in the following table 8.

	Test of Homogeneity of	of Variances			
		Levene	df1	df2	Sig.
		Statistics			
STAD	Based on Mean	.372	1	66	.550
learning	Based on Median	.368	1	66	.546
model	Based on Median and with adjusted df	.369	1	63.583	.547
	Based on trimmed mean	.370	1	66	.560

Table 8. Test the Homogeneity of the Learning Model Student Team Achievement Divisions

 (STAD) in SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II In Batanghari District

Based on the table 8, it can be concluded that the variance of the two variables is the same or homogeneous which is obtained is a significance value of 0.560 that has met the requirements > 0.05

In this test, it is carried out in order to find out the differences in variables on Mathematics subjects. The conditions in this test if the significance value is > 0.05, it can be said that the variable has no difference. If the significance value is < 0.05, then the variable has a significant difference. The T-test of the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district is described in the following table 9.

Table 9. The T Test of Jigsaw Learning Model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri52/I Kilangan II

School name	class	Ν	Sig.	Sig. (2-tailed)
SD Negeri 04/I Sungai Ruan Ilir	VA VB	36 36	0.905	0.030
SD Negeri 52/I Kilangan II	VA VB	36 36	0.758	0.028

From the table 9, it is found that there are differences in the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. This is evidenced by the value of sig (2-tailed) 0.030 and 0.028 < 0.05.

The T-test of the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district is described in the following table 10.

Table 10. As For the T Test of The Learning Model Model Student Team Achievement Divisions(STAD) In SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II

School name	class	Ν	Sig.	Sig. (2-tailed)
SD Negeri 04/I Sungai Ruan Ilir	VA	36		
	VB	36	0.660	0.042
SD Negeri 52/I Kilangan II	VA	36		
	VB	36	0.632	0.018

From the table 10, it is obtained that there are differences in the learning model student team achievement divisions (STAD) in SD Negeri 04/I Sungai Ruan IIir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. This is evidenced by the value of sig (2-tailed) 0.042 and 0.018 < 0.05.

Discustion

Descriptive statistics is a statistical analysis process that focuses on the management, presentation, and classification of data. With this process, the data presented will become more attractive, easier to understand, and able to provide more meaning for data users. When conducting descriptive statistical tests using several indicators of the learning method. Where the indicators on the learning model process skills here use 3 indicators, namely: classification, measuring, and compiling tables. On the results of the descriptive statistical test ofSD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II take two classes each, where in one class there are 36 students with 20 girls and 16 boys with a total of 144 students. The first statistical test here uses the jigsaw learning model, we can see in tables 4 to 6 where based on the results from the table, it can be seen that the category of classification indicators, measuring and compiling tables of the most dominant jigsaw learning model for students of SD Negeri 04/I Sungai Ruan Ilir can be seen from the percentage of good grades.

Then proceed with descriptive statistical tests on the learning model student team achievement divisions (STAD) we can see in tables 7 to 9 where based on the results from the table, it can be seen that the classification indicator category for the STAD learning model in elementary schools is the most dominant of students at SD Negeri 52/I Kilangan II can be seen from the percentage of good scores. Then on the 2nd and 3rd indicators it can be seen where. Based on the results from the table, it can be seen that the indicator category composes a table of the STAD learning model

in elementary schools which is the most dominant student of SD Negeri 04/I Sungai Ruan Ilir can be seen from the percentage value good.

In the next test, there is an assumption test where the data analysis used is: normality test, homogeneity test. Based on the results of the normality test on the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II, the results obtained by the Kolmogorov-Smoniv test, the significance value > from 0.05, it can be concluded that the data is normally distributed. Then, the STAD learning model normality test was obtained with the Kolmogorov-Smoniv test with a significance value of > 0.05, so it can be concluded that the data is normally distributed. In the homogeneous test. Based on the table, it can be concluded that the variance of the two variables is the same or the homogeneity obtained is that the significance value has met the requirements > 0.05.

In this hypothesis test, it is carried out in order to find out the comparison of variables on Mathematics subjects. The conditions in this test if the significance value is > 0.05, it can be said that the variable has no difference. If the significance value is < 0.05, then the variable has a significant difference. The first hypothesis test was obtained that there were differences in the jigsaw learning model at SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. This is evidenced by the value of sig (2-tailed) 0.030 and 0.028 < 0.05. Furthermore, it was found that there were differences in the learning model student team achievement divisions (STAD) in SD Negeri 04/I Sungai Ruan Ilir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. This is evidenced by the value of sig (2-tailed) 0.034 and 0.042 and 0.018 < 0.05. This is evidenced by the value of sig (2-tailed) 0.034 and 0.044 < 0.05. so, it can be concluded that there is a comparison between 2 elementary schools on the learning model and teaching process skills in mathematics.

Teaching skills are abilities or skills that are special (most specific instructional behaviors) that must be possessed by teachers, lecturers, instructors or widyaiswara in order to carry out teaching tasks effectively, efficiently and professionally. The learning process must create an atmosphere so that students are active in education. Based on the school's observations of students' problem-solving skills using the scientific method for future learning (Hartini, 2017; Setiawan, 2019; Chan et al., 2020). Thus, basic teaching skills relate to several skills or abilities that are fundamental and must be mastered by teaching staff in carrying out their teaching tasks. Process skills are important to be promoted as one of learning. So that they are able to carry out the desired learning process. Active learning is seen when students enthusiastically answer questions to improve their skills.

Jigsaw is Active learning techniques are commonly used because these techniques maintain a high level of personal responsibility. The jigsaw learning model further enhances students' general knowledge and basic skills by doing better tasks (Astiti & Murda, 2017; Toril et al., 2018). Therefore, jigsaw is one of the most effective methods used for the learning process. Then there is also a learning model

student team achievement divisions (STAD) namely is a learning method with the simplest and most easily understood approach and contains cooperative learning strategies that provide opportunities for multiple developments with exercises to learn concepts and skills STAD learning model improves communication skills as well as a potential learning model (Rohika, 2017; Kusumawardani et al., 2018; Putra et al., 2018). This has been explained in various articles but no one has discussed these two learning models in one discussion and with descriptive statistical testing using several indicators.

In the learning models that exist in various journals, we can review the jigsaw learning model and student team achievement divisions (STAD). This research is in line with previous research conducted by (Widayanti, 2019; Baken et al., 2020; Chang & Benson, 2020), stated that jigsaw is one type where students are assigned to discuss to exchange ideas. The function of the jigsaw itself is to make it easier to create tasks. Then we can also review the Student Team Achievement Divisions (STAD) learning model from several journals. According to (Wulandari et al., 2017; Rumapea, 2018), stated that in research student team achievement divisions (STAD) is the simplest method in the learning process. We can conclude from previous research that there has been no discussion of the comparison of the two learning models and there is no use of relevant indicators in research that is only done in general. Therefore, the purpose of this study is to make a comparison between process skills in the learning model using indicators.

Based on the presentation of various studies that have been carried out on the comparison of learning models and skills, this can be a basis and reference in conducting research to further research on learning models and teaching skills. in this study discusses in detail about the indicators used, there are 4 indicators of the learning model and 3 indicators of skills used. In this study, researchers measured the learning model and skills in mathematics as the object. The essence of this measurement at school is useful for knowing students' feelings during the learning process. The results of this study are expected to contribute ideas for knowledge and education as well as provide an overview of the learning model and teaching process skills in mathematics subjects. Researchers here test on several indicators of process skills that will be further tested. Then in testing the learning model, it includes all indicators of the two learning models, namely jigsaw and student team achievement divisions (STAD)

4. Conclussion and Suggestion

Based on the results of hypothesis testing research and data analysis, the conclusions of this study are 144 samples of student learning models for mathematics from two schools, namely: SD Negeri 04/I Sungai Ruan IIir and SD Negeri 52/I Kilangan II in Batanghari district. The first hypothesis test was obtained that there were differences in the jigsaw learning model at SD Negeri 04/I Sungai Ruan IIir

and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics. Furthermore, it was found that there were differences in the learning modelstudent team achievement divisions (STAD) in SD Negeri 04/I Sungai Ruan IIir and SD Negeri 52/I Kilangan II in Batanghari district on Mathematics subjects so it can be concluded that there is a comparison between 2 elementary schools on process skills in the learning model of mathematics subjects. Process skills in the learning model for students have no small influence on success, increase learning outcomes, and affect student performance.

5. Autor's Contribution

KK and SS conduct initial observations and formulate problems, RT collects and analyzes data, SF arranges discussions, SR is in charge of writing articles.

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