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Jigsaw Learning VS Student Team Achievement Divisions (STAD): Which One is Better in Improving Learning Outcomes

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Abstract

Social study is an essential subject for intellectual, emotional, cultural and social development for students, namely being able to develop responsible ways of thinking, behaving and behaving as individuals and citizens. The average cognitive results of students from the four schools based on midterm exam (UTS) I scores only 35.4% of students completed, while the rest were failed.The purpose of this study was to determine the differences oflearning outcomes between the Jigsaw learning model and Student Team Achievement Division (STAD) in the cognitive, affective and psychomotor domains. This comparative experimental study uses a pre-test–post-test comparations group design. The data collection tool uses test instruments and non-tests with quantitative data analysis techniques. The cognitive domains of students were measured using test instruments, including pre-test and post-test questions, while to measure affective, and psychomotor were measured using non-test instruments in the form of student observation sheets. The results of this study show that there is no difference increase in cognitive learning outcomes of students taught using Jigsaw and STAD learning models, but there are differences for affective and psychomotor domains. The Jigsaw learning model is more effective in improving social studies learning outcomes compared to that of the learning model (STAD). The highest score of Jigsaw in the cognitive domain is 84.17, and the affective domain is 64.17, but the lowest score of Jigsaw in the psychomotor domain is 63.09. The advantages of STAD in the psychomotor domain is 81.40, but in the affective domain is 59.58, based on learning outcomes in social studies students.

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INTRODUCTION

Social studies in elementary schools have a critical position in the effort to realize the educational goals set out in Law Number 20 of 2003 concerning the national education system. Social study is an essential subject for intellectual, emotional, cultural and social development for students, namely being able to develop responsible ways of thinking, behaving and behaving as individuals or as citizens (Gunawan, 2011). Social studies are needed by students to improve their attitude of responsibility, social attitudes and become an intellectual person.

Difficulties in social studies experienced by students include: low learning enthusiasm, dominant lecture methods and rote learning (Windia, 2014); students are required by teachers to learn (Suprihatiningsih, Rachman, and Suhandini, 2016). The role of the teacher includes several things, namely: teacher as educator, class leader, supervisor, motivator and counselor (Usman, 2001). Motivation and reinforcement must provided by the teacher scientifically (Singga, 2011); and equipped with social values (Maftukhah, Harmanik, and Sunarto, 2012). The learning process undertaken by teachers is expected to be able to understand their students psychologically, morally and socially so that learning can be maximized (Kusumawati, 2014; Lynch, Smith, Provost, and Madden, 2015). There were some findings in the field experienced by students, such as learning material that is difficult to understand, learning is boring, and dominated by teacher lectures.

Based on the results of interviews with fifth-grade teachers, in four elementary schools, the facts found were: the completeness value of each school was classified as low. The average completeness of the Mid Semester I Exam, from the four schools only 35.4% of students completed, with the same complaints, Social studies are challenging to learn and memorize.

Research conducted by the Ministry of National Education and Research Center of the Curriculum (2007) on Social studies curriculum policy studies shows that the learning strategy or approach is misunderstood. This lead the social studies as a lesson that tends to memorize. This problem is the scope of learning Social studies that are motivated by real-life so that the knowledge learned continues to develop following changing times.

Based on the explanation, the solution offered is to use the Jigsaw learning model and STAD to improve social studies student learning outcomes. The basis of the selection of learning models adjusts the conditions of student characteristics, as explained in Vygotsky's learning theory that the social interaction of cultural factor experiences influences the development of one's cognitive maturity which influences the ability of the learning process based on student needs (Suminar, Prihatin, and Syarif, 2016). Piaget and Vygotsky's learning theory on the Jigsaw and STAD learning model is focused on the mindset of students trained to understand learning material through discussion and tested through quizzes given by teachers (Dianti and Suprijono, 2015).

Research consistently reinforces that students involved in Jigsaw model learning get better achievements and more positive attitudes towards learning, in addition to mutual respect for differences and opinions of others (Rusman, 2014) The students are divided into expert groups, and original groups aimed at maximizing and equal learning outcomes (Arends, 2008; Azni, and Jailani, 2015). Jigsaw managed to reduce students' reluctance to participate in classroom activities and help create an active student-centered atmosphere (Mengduo and Xiaoling, 2010).This is in line with the findings students after implementing learning with the jigsaw model, students are more enthusiastic, more enthusiastic, more able to explore abilities, and can work well together.

By implementation of STAD learning model hopes that student learning outcomes in Social studies subjects can increase because the main role is to motivate students (Slavin, 2007). This model focuses on grouping students into a team; the team works together to help each other in understanding the subject matter and ends with quizzes/tests individually, and scores in groups. This is reinforced from the results of Indraswari

(2014) research which showing that the cooperative type model is useful for improving reading skills as evidenced by the improvement of student learning outcomes during the research process. Istiana, Sarwi, and Masturi (2016) showed that the STAD cooperative learning model could improve students' mastery of concepts. Also, by applying the STAD cooperative learning model students' process skills experience significant development.This is in line with the findings in school when students begin to understand the flow of the STAD model students enjoy more in the learning process, students are more willing to submit opinions, presentations, and answer teacher questions well.

The purpose of the research is find out how much difference and improvement in social studies student learning outcomes between the Jigsaw learning model and STAD in the cognitive, affective and psychomotor domains, determine the effectiveness of students' Social Studies learning outcomes in the cognitive, affective, psychomotor domains in the Jigsaw learning model and Student Team Achievement Division (STAD). The benefits of the study are expected to be an addition to the existing knowledge treasury, especially regarding the effectiveness of the Jigsaw and STAD learning models for social studies learning outcomes of elementary school students.

METHODS

This study uses a Jigsaw learning model and STAD with a quasi-experimental research design. Sampling technique is a combination of cluster/area sampling and purposive sampling. The technical analysis used is a one-way and two-way analysis of variance (Anova).The research design used in this study was experimental, pre-test - post-test comparations group design. The experimental group 1 of the Jigsaw model and then compare it with the experimental results 2 of the STAD model. This study was analyzed using test data in the form of written tests, namely multiple-choice test, and essay test to measure students' cognitive, and notes in the form of student observation sheets to measure affective, and psychomotor students during the learning process.

Hatimah (2007) proposed that the steps in the comparative study are as follows: (1) formulate and define the problem, (2) explore and examine the existing literature, (3) formulate the theoretical framework and hypotheses and assumptions used, (4) make a research plan, (5) test hypotheses, for interpretation of relationships with appropriate statistical techniques, (6) make generalizations, conclusions, and policy implications, (7) arrange reports using scientific writing. The population in this study were all schools in the Jekulo District, Kudus Regency Academic Year 2016/2017. The research samples were in 4 elementary schools, namely Elementary School 2 Klaling, Elementary School 1 Tanjungrejo, Elementary School 4 Honggosoco, and Elementary School 6 Hadipolo in Jekulo District, Kudus Regency.

RESULTS AND DISCUSSION

The results of the Jigsaw and STAD learning models obtained maximum results, which began with preparation, explanation of the material, implementation of learning according to the syntax of each learning model, observation of students in the cognitive, affective and psychomotor domains, until the last stage of evaluation. For more details, the researcher will explain in more detail in Table 1.

Based on Figure 1 on the cognitive aspect between the Jigsaw and STAD models, t_{value} = 1.301 is obtained. t_{table} for dk = 23, α = 0.05 is 2.074. So $t_{value} < t_{table}$, means that H_0 is accepted, meaning that there is no difference in improvement between the Jigsaw model and STAD on cognitive aspects.

The difference in the increase in affective aspects between the Jigsaw and STAD models is obtained by t_{value} = 0.922. t_{table} for dk = 23, α = 0.05 is 2.074. So $t_{value} < t_{table}$, means that H_0 is accepted < t_{table} = 2.074, meaning H_0 is rejected, meaning that there is no difference in improvement between the Jigsaw model, and STAD in the affective aspect.

The difference in the increase in psychomotor aspects between the Jigsaw and STAD models is obtained by $t_{value} = 0.816$. t_{table} for dk = 23, α = 0.05 is 2.074. So $t_{value} < t_{table}$, means that H_0 is accepted < $t_{table} = 2.074$, meaning H_0 is rejected, meaning that there is no difference in improvement between the Jigsaw and STAD models in the psychomotor aspect.

To test the hypothesis, the researcher used a two-way ANOVA analysis. The results of the two-way ANOVA analysis using SPSS is persented in Table 1.

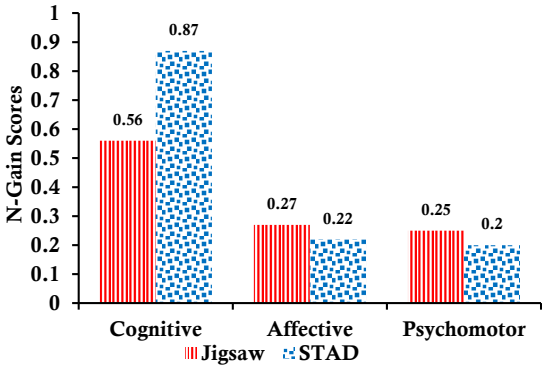

Figure 1. The Difference in Increased N-Gain on Student Learning Outcomes

Table 1. ANOVA Test Results N-Gain between Jigsaw Learning Outcomes and STAD

Source	Type III sum of squares	df	Mean square	F	Sig.
Corrected model	8.545[a]	5	1.709	6.771	.000
Intercept	22.349	1	22.349	88.549	.000
Model	.191	1	.191	.758	.385
Location	7.331	2	3.665	14.523	.000
Model * Aspect	1.023	2	.511	2.026	.136
Error	34.830	138	.252		
Total	65.724	144			
Corrected total	43.375	143			

[a]R squared = .197 (Adjusted R squared = .168)

Aspects of Learning Models

This test aims to find out whether there is a significant relationship between the two factors. In this case, we will test whether there is an interaction between the learning model and the learning model group.

Hypothesis:

H_0 : there is no difference between Jigsaw and STAD learning outcomes based on the location of the school

H_1 : there is a difference between the Jigsaw and STAD learning outcomes based on the location of the school

Decision making:

$F_{value} < F_{table}$ or sig value > 0.05, then H_0 is accepted

$F_{value} > F_{table}$ or sig value < 0.05, then H_0 is rejected, so H_1 is accepted

Decision:

Table 1 shows that the value of F_{value} = 2.026 and F_{table} = 3.06, or the significant value obtained from table 2 is 0.136. This means that H_0 is accepted. So it can be concluded there is no difference between the increase in learning outcomes based on the location of the school and the learning model. Calculation of average cognitive learning outcomes can be seen in Table 2.

Table 2. Cognitive

School	Average cognitive learning outcomes		Category
	Jigsaw	STAD	
Elementary School 6 Hadipolo	79.79	-	Very good
Elementary School 1 Tanjungrejo	84.17	-	Very good
Elementary School 2 Klaling	-	80.13	Very good
Elementary School 4 Honggosoco	-	81.17	Very good

Table 2 explains the cognitive aspects by implementing two learning models for both jigsaw and STAD in very good categories at intervals of 80-100 in all schools namely Elementary School 6 Hadipolo, Elementary School 1 Tanjungrejo, Elementary School 2 Klaling, and Elementary School 4 Honggosoco.

Calculation of average affective learning outcomes can be seen in Table 4.

Table 3. Affective

School	Average Affective Learning Outcomes		Category
	Jigsaw	STAD	
Elementary School 6 Hadipolo	64.17	-	Good
Elementary School 1 Tanjungrejo	59.58	-	Good
Elementary School 2 Klaling	-	59.58	Good
Elementary School 4 Honggosoco	-	61.88	Good

Table 3 generally explains the affective aspects by implementing two learning models both Jigsaw and STAD in the good category at intervals of 60-79 in all schools, namely at Elementary School 6 Hadipolo, Elementary School 1 Tanjungrejo, Elementary School 2 Klaling, and Elementary School 4 Honggosoco. Calculation of the average psychomotor learning outcomes can be seen in Table 4.

Table 4. Psychomotor

School	Average psychomotor learning outcomes		Category
	Jigsaw	STAD	
Elementary School 6 Hadipolo	63.09		Good
Elementary School 1 Tanjungrejo	63.83		Good
Elementary School 2 Klaling		81.10	Very good
Elementary School 4 Honggosoco		81.40	Very good

Table 4 generally explains that psychomotor aspects by implementing two learning models both Jigsaw and STAD are in the good category at intervals of 60-79 in all schools, namely Elementary School 6 Hadipolo, Elementary School 1 Tanjungrejo, Elementary School 2 Klaling, and Elementary School 4 Honggosoco. Comparison of cognitive, affective, and psychomotor learning outcomes based on the distance between the School and the District can be seen in Table 5.

Table 5 shows that the learning outcomes in the cognitive domain, the highest in the cognitive domain of the Jigsaw model are 84.17 (Schools close to the District), the affective domain of the Jigsaw model is 64.17 (Schools far from the District), the psychomotor domain of the STAD model is 81.40 (The farthest schools from the District). Based on the results above, it can be concluded that schools using the Jigsaw model are superior in the cognitive and affective domains, while schools that use the STAD model excel in the psychomotor domain.

Table 5. Results of Comparison of Social Studies Student Learning Outcomes by School Distance

School distance	Jigsaw			STAD		
	Learning outcomes			Learning outcomes		
	Cognitive	Affective	Psychomotor	Cognitive	Affective	Psychomotor
Nearest (500 meters) Elementary School 2 Klaling	-	-	-	80.12	59.58	81.10
Near (3.7 km) Elementary School 1 Tanjungrejo	84.17	59.58	63.83	-	-	-
Far (4.5 km) Elementary School 6 Hadipolo	79.79	64.17	63.09	-	-	-
Farthest (6.5 km) Elementary School 4 Honggosoco	-	-	-	81.17	61.88	81.40

Analysis Results from Normalized Gain Calculation

The average data for the increase in normalized gain is obtained from the results of the increase in the pre-test to the post-test. The results of the normalized gain can be seen in Table 6.

Table 6. Results of Jigsaw Group N-Gain (g) Analysis and STAD

Experimental group	Average N-gain	Graduation category
Jigsaw	0.70	Very effective
STAD	0.71	Very effective

The normalized Jigsaw class gain average reaches 0.70. This shows that the increase is at N-gain 0.30 < (g) < 0.70, which means that the criteria are very effective. The class in the STAD group shows 0.71, and this indicates that the increase is at N-gain 0.30 < (g) < 0.70, which means the criteria for very effective. Then it can be concluded that the experimental results 1 and 2 are equally effective and able to improve learning outcomes in social studies subjects. Jigsaw and STAD learning models have the same level of effectiveness when implemented in class. However, each model has different advantages. Jigsaw has benefits in the cognitive and affective domains shown in table 5.This is in line with the research conducted by Aurum, and Hidayati (2013) that learning by implementing the Jigsaw learning model gets results with very high categories, compared to using other learning models. Furthermore, research conducted by Yu (2016) that Jigsaw was able to improve research learning and consulting techniques for postgraduate students with satisfying achievements and ready to become a reference that can be used in universities in Hongkong. The results of the same study were conducted by Chu (2014) that the Jigsaw model was a solution to economic learning carried out in the classroom, the results of which were able to motivate students to master the material to improve student achievement.

STAD has an advantage in the psychomotor domain that has been explained in table 5. This is in line with research conducted by Yasir (2015) that the giving of STAD learning models has a positive impact that students are more enthusiastic, able to increase the accuracy and readiness of students in answering questions, with the STAD model makes it easy for students to exchange ideas, positive interdependence, make students more confident, when solving problems, and help group friends who have difficulty understanding the content.

CONCLUSION

Based on the results of the above research, the Jigsaw and STAD learning models are effective in improving student learning outcomes in social studies subjects, but each learning model has different results. Based on the above-average learning outcomes, it can be concluded that schools using the Jigsaw model are better in the cognitive domain, namely 84.17 and affective, which is 64.17, while the schools that use the STAD model are better in the psychomotor domain, namely 81.40. The findings in this study differ from the results of other studies that have been conducted by other researchers, namely the benefit of each Jigsaw and STAD learning model, which is measured from the cognitive, affective, and psychomotor domains. Teachers can use this learning model to measure three domains of their students.

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