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The Effect of Student Teams Achievement Division (STAD) Learning Model and Social Skills on the Critical Thinking Ability in Four Grade Students of SD Negeri 05 Pauh Lubuk Sikaping

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Abstract

This study aims to: (1) To find out the differences of mathematical critical thinking ability of students taught with the STAD type cooperative learning model compared to conventional learning models; (2) To find out the difference of mathematical critical thinking ability of students who have high social skills compared to students who have low social skills; and (3) To find out the interaction between learning models and social skills in effecting the students' critical thinking ability. The population in this study were all grade four students at SD Negeri 05 Pauh Lubuk Sikaping, the number of students was 54, consisting of four grade A and four grade B. Data collection techniques used in this study were social skills questionnaires and critical thinking ability tests. The data analysis technique used in this study was inferential statistical techniques. Hypothesis testing is done by Two Way Anova test with a significant level of 0.05. The results showed that: (1) mathematical critical thinking ability of students taught with the STAD type cooperative learning model was higher than mathematical critical thinking ability of students taught with the conventional learning model (F_{count} = 21.164 and sig. 0.000> 0.05); (2) The mathematical critical thinking ability of students who have high social skills was higher than the mathematical critical thinking ability of students who have low social skills (F_{count} = 6.756 and sig. 0.012> 0.05); and (3) There was an interaction between learning models and social skills in effecting mathematical critical thinking ability of students (F_{count} = 7.054 and sig. 0.011> 0.05).

Keywords
STAD; social skills; critical thinking skills

I. Introduction

Critical thinking ability is the basis for analyzing arguments and developing a logical mindset. This is in line with the opinion of Einav (2015: 455-456) who said that critical thinking is an important ability for contemporary life, then the benefits of critical thinking are for a lifetime, can support students in the regulation of their learning abilities and then can empower individuals to contribute creatively for the profession they will choose, in this study we think that critical thinking is based on disposition and ability.

Students' critical thinking ability can be obtained with a mathematical mindset, this is in line with the opinion of Lambertus (2009) which states that mathematics material and critical thinking ability are two things that cannot be separated, because mathematical material is understood through learning mathematics. The ability to think critically, systematically, logically, creatively and productively can be developed through the learning of mathematics in

schools because mathematical material focuses on systems, structures, concepts, principles, as well as the tight links between an element and other elements.

According to Wasriono (2015) that mathematics learning has so far been centered on teachers as sources of knowledge, teachers tend to use expository methods in the form of lectures, give examples and exercises so that it will limit students' critical thinking ability in finding concepts, understanding concepts, and using procedures required by students in solving mathematical problems. This statement is reinforced by the opinion of Surya and Syahputra (2017), that almost all of the learning processes of mathematics in school begin with a share of definitions, formulas, examples, and ends with exercises. In addition, according to Saragih & Habeahan in 2014, many students saw mathematics as a difficult field of study to understand. This happens because mathematics is presented in a form that is less attractive and seems difficult for students to learn.

The low of mathematical critical thinking ability possessed by students is also supported by the fact of the results of research conducted by Hasibuan and Surya (2016) which states that students' mathematical critical thinking abilities are still in the low category. It is known that 65.6% or as many as 23 students have critical thinking ability mathematically in the low category and 34.4% or as many as 12 students have critical thinking ability mathematically in the very low category.

Research elsewhere concludes the same thing, as in the Selamat's research (2015: 404) at Al-Ittihah MTS Private School it is known that of 34 students, for indicators identifying only 14 students who are complete, indicators formulate the subject matter for only 7 students, for indicators analyze, determine the solution and look for other alternatives no one is completely finished. This shows that critical thinking of Al-Ittihah MTS Private School students is still low.

Critical thinking ability has an impact on student learning outcomes, because the level of learning outcomes achieved in subject matter is only determined by the amount of effort or craft shown by it. Therefore, a person's success and failure is due to his effort and ability. Based on observations made, that in the learning process at SD Negeri 05 Pauh Lubuk Sikaping there were several problems faced by students. After the researcher made observations, several problems were found, including students who were able to mention the characteristics of fractions that corresponded to the learning concept of only 15.62%, students who were able to cite examples of real objects that picked fractions according to the concept of learning were only 21.87%, students who were able to visualize the image in question then operate the fractions into the formula only 12.5%, students who are able to draw examples of fractions that fit the learning concept are only 25%, and students who are able to make teaching aids concerning fractions in accordance with the learning concept 21, 87%.

Factors that effecting the low ability of critical thinking in learning mathematics in research sites is the desire of students to follow learning is still low because of the use of learning models that are less precise. During this time the teacher still uses conventional strategies that are only teacher-centered so the process of using learning in the classroom is less fun. Students still have difficulty in mentioning the properties of fractions. This resulted in learning objectives not as expected.

Based on the facts of the results of the initial dialogue with the teacher and observation at SD Negeri 05 Pauh Lubuk Sikaping, it shows that the learning process in the classroom is still not optimal. In the initial conditions of four grade A and four grade B students at SD Negeri 05 Pauh Lubuk Sikaping, they had low mathematics learning activities, such as: 1. the activeness of asking questions (17.24%), 2. The activeness of expressing ideas (10.34%), 3. the activeness

of discussion (31.04%), 4. Student learning outcomes which ≥ Minimum completeness criteria 70 (34.48%).

Lack of student activity in the classroom due to the use of teaching methods that are not appropriate or inappropriate so that students cannot easily understand and master the material presented. In order for teaching and learning activities to achieve the optimal objectives, teachers are expected to have the abilities needed by students, master the material taught, be able to classify various teaching methods and master teaching techniques. Determination of methods for teachers is quite important. Student success will depend a lot on the methods used by the teacher. In the learning process, students work at the request of the teacher, according to the way determined by the teacher, as well as thinking according to what is outlined by the teacher.

II. Review of Literature

2.1 Mathematical Critical Thinking Ability

Critical thinking ability does not mean gathering information, but sometimes someone who has good memory and knows a lot of information will not necessarily be good at critical thinking. A critical thinker should have the ability to make or draw conclusions from all the information he knows, he can also know how to use the information he has to solve a problem, and find relevant information sources to help him solve a problem. Critical thinking always teaches to always be honest and open to the views of others, especially honest with yourself. Based on the description above, the conclusion of critical thinking is an absolute thinking that makes sense for someone to make a decision that is believed and believed to be true.

Thoughts are ideas and mental processes, thinking allows one to represent the world as a model and effectively treats it according to its goals, plans and desires. Words that refer to the same concepts and processes include cognition, understanding, awareness, ideas and imagination. Thinking involves brain manipulation of information, such as when we form concepts, engage in problem solving, make reasoning and make decisions.

Thinking is a symbolic representation of some event or item in the world (Khodijah, 2014: 103). According to Solso (Khodijah, 2014: 103) "Thinking is a process in which new mental representations are shaped through the transformation of information by complex interactions of mental attributes such as judgment, abstraction, logic, imagination and understanding of the problem". Sardiman (2011: 46) states that thinking is a mental activity to be able to formulate the understanding of synthesizing, and drawing conclusions. Mathematics as a discipline has different characteristics from other disciplines. Mathematics learns about patterns, structures, organized order, which starts with undefined elements then on the elements that are defined, continue to the axioms or postulates until the theorem. This mathematical component forms a system that is interconnected with organized. Given the mathematical characteristics that are not the same as other disciplines, so thinking critically in mathematics must be in accordance with mathematical concepts and methodologies.

While Rochaminah (Kurniasih, 2012: 118) defines critical thinking ability mathematically as a series of non-procedural thinking abilities in the form of the ability to find analogies, analysis, evaluation, solve non-routine problems and prove. So that critical thinking ability mathematically is a cognitive activity to solve mathematical problems by using the ability to recognize, analyze, evaluate and prove a problem.

2.2 The Indicator of Mathematical Critical Thinking Ability

A person's critical thinking ability can be demonstrated through several indicators. Glaser (Fisher, 2014: 7) argues that indicators of critical thinking include: a) Identifying the problem; b) Find ways that can be cursed to handle those problems; c) Gathering and compiling necessary information; d) Recognize assumptions and values that are not stated; e) Understand and use appropriate, clear and has language; f) Analyzing data; g) Assess facts and evaluate statements; h) Recognize the existence of a logical relationship between problems; i) Draw conclusions and similarities as needed; j) Test the similarities and conclusions that someone takes; k) Rearranging patterns of one's beliefs based on broader experience; and l) Make appropriate judgments about certain things and quantities in daily life.

Disposition for Critical Thinking in the Mathematics Classroom, as well as research by Zhou, Huang, and Tian (2013) as outlined in the journal with the journal Developing Students' Critical thinking ability by Task-Based Learning in Chemistry Experiment Teaching. With many studies using indicators of critical ability Facione indicates that the indicator of Facione is proven to be used to measure critical thinking skills.

From some of the expert opinions, the indicators of critical thinking ability used in this study were: a) Interpreting, that is understanding the problem indicated by writing the known and asked the right questions; b) Analyzing, that is identifying the relationships between the statements and concepts given in the problem indicated by making mathematical models correctly; c) Evaluating, that is using the right strategy in solving problems, complete and correct in doing calculations and d) Inferencing, that is making conclusions correctly.

2.3 Social Skills

Potentially children are born as social creatures. Social development is the acquisition of abilities in accordance with social demands. Rachmawati (2008: 68) argues that: "social skills are the ability of children to be able to react to one's ability to adapt properly to their environment and avoid conflict when communicating both physically and verbally".

Sjamsuddin and Maryani in (Ahmad Susanto, 2014: 42) social skills are an ability that is visibly visible in action, able to search, sort and process information, able to learn new things that solve everyday problems, have good oral communication skills as well as writing, understand, appreciate and be able to work together with others who are diverse, able to transform academic abilities and adapt to the development of global society.

Nancy J. Patrick (2008: 42) argues that "social skills are abilities that we are expected to use to interact with others in our community environment". These skills are based on social norms in our community environment and they tell us how to behave and behave that are considered normal, accepted and expected in certain social situations. Furthermore Sharon A. Lynch and Cynthia G. Simpson (2010: 1) argue "social skills are behaviors that enhance positive interactions with others and the environment. Some of these skills include showing empathy, participation in group activities, generosity, helping, communicating with others, negotiating, and problem solving ".

From some of the opinions expressed above, it can be concluded that social skills are skills that must be possessed by children from an early age when interacting with others, with the surrounding environment and can adapt to be accepted by the surrounding environment.

Self-management behavior, that is the ability of individuals to regulate themselves in social situations, social behavior that arises because of consideration and appreciation in themselves. This can be demonstrated through the following behavior: 1) remain calm when there is a problem and can control emotions when angry, 2) follow the rules, accept the limits

given, 3) make appropriate compromises with others when facing conflict, 4) receive criticism from others well, 5) respond to distractions from friends by ignoring, give an appropriate response to distractions, 6) cooperate with others in various situations, and 7) responsible behavior.

2.4 Student Teams Achievement Division (STAD) Learning Model

The teacher acts as a medium in learning as well as learning actors. The teacher must have a strategy and model of learning in the classroom. According to Jihad and Haris (2010: 25) which states that the learning model can be interpreted as a plan or pattern used in compiling the curriculum, organizing student material, and giving instructions to instructors in class and in teaching plans.

Furthermore, the definition of learning models according to Trianto (2007: 1) which means that the learning model is a plan or pattern that is used as a guide in planning learning in class. While the meaning of the learning model according to Agus (2009: 46) states that the learning model is the foundation of learning practices resulting from the decline in educational psychology theory and learning theory that is designed based on an analysis of curriculum implementation and its implications at the classroom operational level.

Based on the understanding, concept theory / definition of some of the experts above about the learning model, it can be concluded that the meaning of the learning model is a planning pattern that is used and serves as a guideline for the planning of the learning process (teaching and learning) that will be implemented.

According to Karunia and Mokhammad (2015: 45) STAD is one type of cooperative learning model that emphasizes team achievements based on team reconitions obtained from the sum of all individual progress scores for each team member. In this study, students are grouped into teams consisting of 4-5 students representing all parts of the class in terms of academic performance, gender, race, and ethnics. "The formation of the team is based on the academic achievements of students in the class as follows:

According to Kurniasih and Sani (2016: 22) in STAD, group awards based on the score of this group were obtained from individual improvements in each quiz. Contribution of students' improvement points to their groups is based on provisions. According to Trianto (2009 69-70), this type of STAD cooperative learning also requires careful preparation before learning activities are carried out. These preparations include:

a. Learning Media

Before carrying out the learning activity needs to be prepared learning media, which include Learning Plans, Student Books, Student Activity Sheets (Worksheet) along with the answer sheets.

b. Form a Cooperative Group

Determining group members is endeavored so that the ability of students in groups is heterogeneous and the ability between one group and other groups is relatively homogeneous

c. Determine the Initial Score

Initial scores that can be used in cooperative classes are previous test scores. This initial score can change after there is a quiz. For example, after further learning and after the test, the results of each individual test can be used as an initial score

d. Seating Arrangement

Seating arrangements in cooperative classes need to be well regulated, this is done to support the success of cooperative learning if there are no seating arrangements can cause chaos that causes failure in cooperative learning.

e. Work in group

To prevent barriers to the STAD type of cooperative learning, group training exercises are held first. It aims to further introduce each individual in the group.

III. Research Method

This type of research was quasy experiment with 2x2 factorial design. This research was conducted at SD Negeri 05 Pauh Lubuk Sikaping, Pasaman Regency, West Sumatra Province. The population in this study were all four grade students at SD Negeri 05 Pauh Lubuk Sikaping, the number of student was 54 students, consisting of four grade A and four grade B. Data collection techniques used in this study were social skills questionnaires and critical thinking ability tests. The data analysis technique used in this study was inferential statistical techniques. Hypothesis testing is done by Two Way Anova test with a significant level of 0.05. Before the Two Way Anova test was performed, first the analysis requirements test was performed, that were the normality test and the data homogeneity test. The normality test was carried out by the Kolmogorov-Smirnov test while the homogeneity test of the data was carried out by the Levene test with a significance level of 0.05.

IV. Result and Discussion

4.1 Data Description

a. Pre-Test of Mathematical Critical Thinking Ability in Experimental Class Students

From the results of statistical calculations it is known that the mathematical critical thinking ability of students taught with the STAD model gets the lowest score obtained by students is 45 and the highest score is 75 with an average obtained is 61.11; the median is 60.00; and the mode is 60; standard deviation of 7.38; and variants of 54.49. Furthermore, the frequency distribution data above can be described in the form of the following histogram:

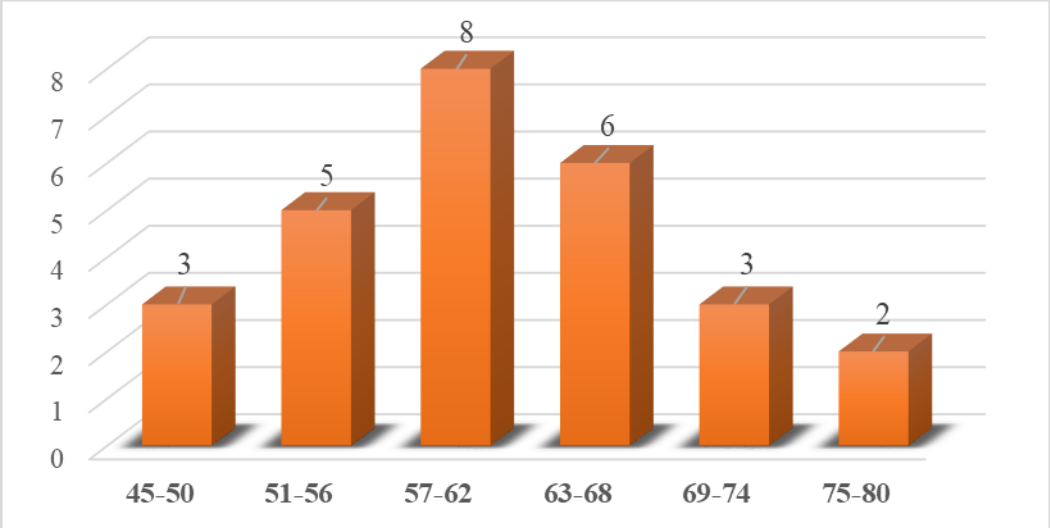

Figure 1. *Histogram of Mathematical Critical Thinking Ability in Experimental Class students*

b. Pre-Test of Mathematical Critical Thinking Ability in Control Class Students

From the results of statistical calculations it is known that the mathematical critical thinking ability of students taught with conventional models gets the lowest score obtained by students is 40 and the highest score is 80 with an average obtained is 59.81; the median is

60.00; and mode which is 65; standard deviation of 9.85; and variants of 97.08. Furthermore, the frequency distribution data above can be described in the form of the following histogram.

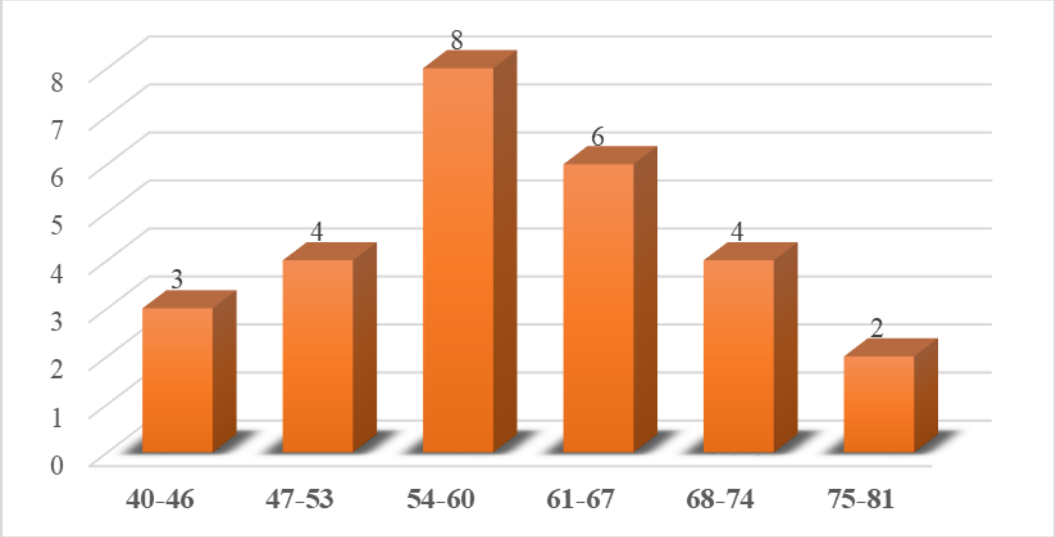

Figure 2. *Histogram of Mathematical Critical Thinking Ability in Control Class Students*

c. Post-Test of Mathematical Critical Thinking Ability of Students Taught with the STAD Model

From the results of statistical calculations it is known that the mathematical critical thinking ability of students taught with the STAD model get the lowest score of 75, and the highest score of 95, with an average of 86.85; variance of 40.67 and standard deviation of 6.38. The frequency distribution of mathematical critical thinking ability scores of students taught with the STAD Model is presented in the following figure:

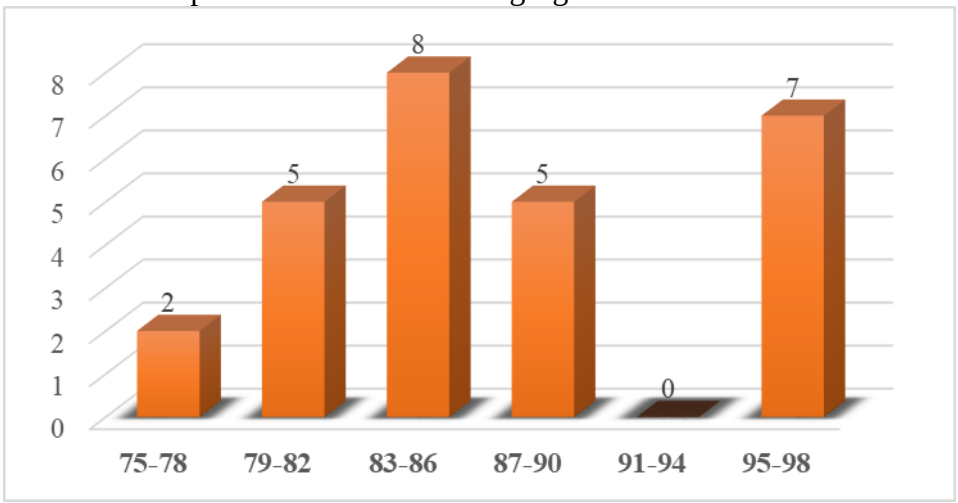

Figure 3. *Histogram of Mathematical Critical Thinking Ability of Students Taught with the STAD Model*

d. Mathematical Critical Thinking Ability of Students Taught with Conventional Models

From the results of statistical calculations it is known that the mathematical critical thinking ability of students taught with conventional models get the lowest score of 55, and the highest score of 95, with an average of 78.52; variance of 82.34 and standard deviation of 9.07.

The frequency distribution of mathematical critical thinking ability scores of students taught with conventional models is presented in the following figure:

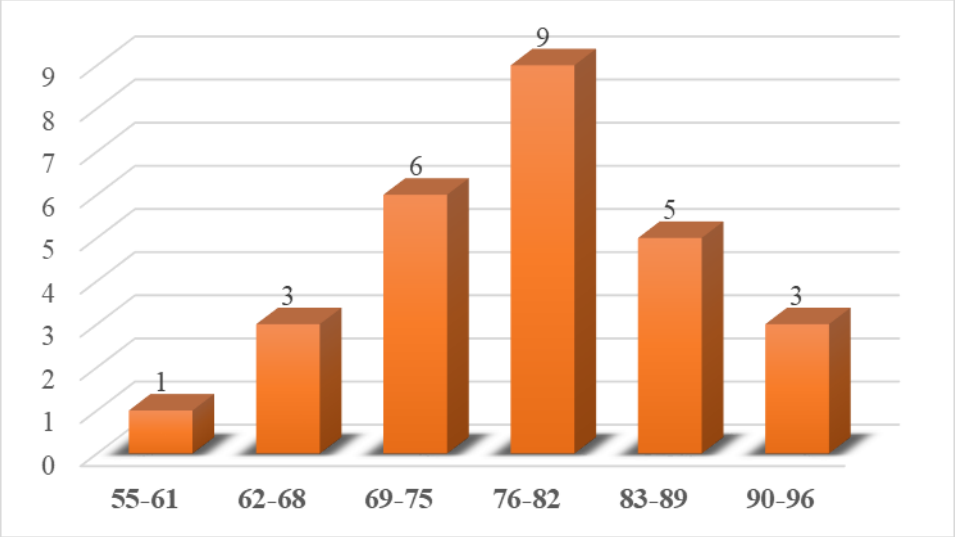

Figure 4. *Mathematical Critical Thinking Ability of Students Taught with Conventional Models*

4.2 Test Prerequisites

a. Normality test

Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	df	Sig.	Statistic	df	Sig.
Standardized Residual for PPKn Learning Outcomes	,113	54	,085	,968	54	,155

a. Lilliefors Significance Correction

Based on the table above shows that the results of normality testing of research data obtained sig. of 0.085> 0.05, thus it can be concluded that the research data is normally distributed.

b. Homogeneity Test

Levene's Test of Equality of Error Variances

Dependent Variable: Mathematical Critical Thinking Ability

F	df1	df2	Sig.
2,663	1	52	,109

Based on the table above that shows homogeneity testing of research data obtained sig. of 0.109> 0.05, thus it can be concluded that the research group data is relatively the same or homogeneous.

4.3 Hypothesis Test

Testing the hypothesis of this study using the 2x2 factorial ANAVA pathway. Hypothesis testing data can be seen in the following table:

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Table 1. SPSS Two Way Anova Calculation Results

Tests of Between-Subjects Effects

Dependent Variable: Mathematical Critical Thinking Ability

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	1626,655[a]	3	542,218	10,806	,000
Intercept	369145,744	1	369145,744	7356,453	,000
Learning Model	1062,012	1	1062,012	21,164	,000
K_S	338,992	1	338,992	6,756	,012
Learning Model* K_S	353,970	1	353,970	7,054	,011
Error	2508,993	50	50,180		
Total	373325,000	54			
Corrected Total	4135,648	53			

a. R Squared = ,393 (Adjusted R Squared = ,357)

Table 2. Comparison of mathematical critical thinking ability based on the learning model

Dependent Variable: Mathematical Critical Thinking Ability

Learning Model	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
STAD	87,417	1,372	84,661	90,172
Conventional	78,516	1,364	75,776	81,257

Table 3. Comparison of mathematical critical thinking ability based on social skills

Dependent Variable: Mathematical Critical Thinking Ability

Social Skill	Mean	Std. Error	95% Confidence Interval	
			Lower Bound	Upper Bound
High	85,481	1,418	82,633	88,329
Low	80,452	1,316	77,809	83,096

First Hypothesis

Ho: $\mu A1 \leq \mu A2$

Ha: $\mu A1 > \mu A2$

Based on the SPSS output ANAVA calculation results shows that the score of F_{count} = 21.164 and the significant score of the learning model is 0.000 <0.05. Thus it can be said that there is significant differences between the average learning outcomes of students taught with the STAD Model compared to conventional models. Furthermore, based on the SPSS output on the comparison of mathematical critical thinking ability based on the learning model it is found that the average mathematical critical thinking ability of students taught with the STAD Model is 87.417. While the mathematical critical thinking ability of students taught with conventional models is 78.516. This shows that the average mathematical critical thinking ability of students taught with the STAD Model is higher than the average mathematical critical thinking ability of students taught with conventional models. So the hypothesis testing rejects Ho and accepts Ha. Thus it can be concluded that the mathematical critical thinking ability of students taught with the STAD model are higher than students taught with conventional models.

Second Hypothesis

Ho: $\mu B1 \leq \mu B2$

Ha: $\mu B1 > \mu B2$

Based on the SPSS output ANAVA calculation results, it was found that the score of F_{count} = 6.756 and the probability or significant value of 0.012 <0.05. Thus it can be said that there is significant differences between the average learning outcomes of students who have high social skills compared to the learning outcomes of students who have low social skills. Furthermore, based on the SPSS output on the comparison of mathematical critical thinking ability based on the level of students' social skills it is found that the average mathematical critical thinking ability of students who have high social skills is 85.481. While critical thinking ability mathematically students who have low social skills amounted to 80,452. This shows that the average mathematical critical thinking ability of students who have high social skills is higher than the average mathematical critical thinking ability of students who have low social skills. So the hypothesis testing rejects Ho and accepts Ha. Thus it can be concluded that the mathematical critical thinking ability of students who have high social skills is higher than students who have low social skills.

Third Hypothesis

Ho: A x B = 0

Ha: A x B ≠ 0

Based on the SPSS output the ANAVA calculation results show that F_{count} = 7.054 and a significant score of 0.011 with α = 0.05. Then it can be seen that the score of sig. 0.011 <0.05 so the hypothesis testing rejects Ho and accepts Ha. Thus it can be concluded that there is an interaction between learning models and social skills in effecting students' mathematical critical thinking ability. The interaction of learning models and social skills in effecting students' mathematical critical thinking abilities can be seen in the following figure.

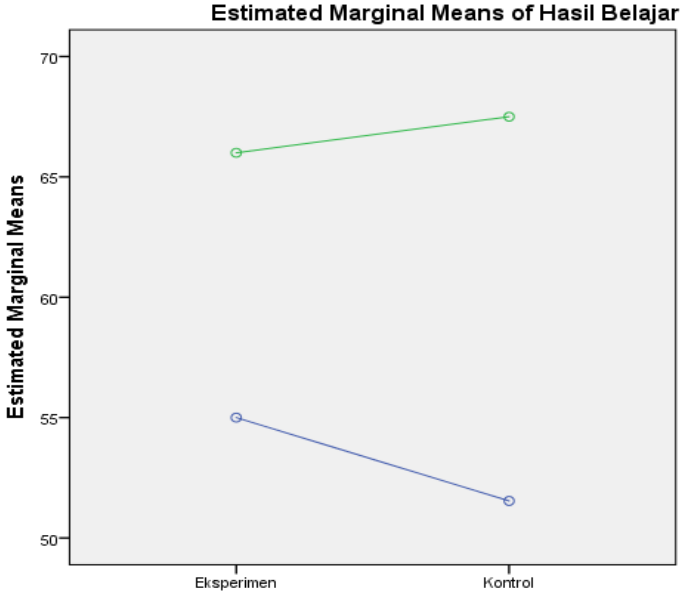

Figure 5. *Interaction of learning models and social skills in effecting the mathematical critical thinking ability*

4.4 Tukey Test

After testing the hypothesis, it is necessary to further test using the Post Hoc with the Tukey test, the results of which are presented in the following table.

Table 4. SPSS Output Tukey Test Results
Multiple Comparisons
Dependent Variable: Mathematical Critical Thinking Ability
Tukey HSD

(I) Social Skill	(J) Social Skill	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
STAD-KS High	STAD-KS Low	10,17*	2,744	,003	2,88	17,46
	Conventional- High	14,04*	2,836	,000	6,50	21,57
	Conventional- Low	13,93*	2,787	,000	6,52	21,33
STAD-KS Low	STAD-KS High	-10,17*	2,744	,003	-17,46	-2,88
	Conventional- High	3,87	2,684	,480	-3,26	11,01
	Conventional- Low	3,76	2,632	,488	-3,23	10,76
Conventional- High	STAD-KS High	-14,04*	2,836	,000	-21,57	-6,50
	STAD-KS Low	-3,87	2,684	,480	-11,01	3,26
	Conventional- Low	-,11	2,728	1,000	-7,36	7,14
Conventional- Low	STAD-KS High	-13,93*	2,787	,000	-21,33	-6,52
	STAD-KS Low	-3,76	2,632	,488	-10,76	3,23
	Conventional- High	,11	2,728	1,000	-7,14	7,36

Based on observed means.
The error term is Mean Square (Error) = 50,180.
*. The mean difference is significant at the 0.05 level.

Based on Table 4, an explanation about the Tukey test can be given. The explanation is as follows:

1. Based on the results of the Tukey test it can be concluded that there are significant differences between the ability of students taught with the STAD Model and have high social skills compared to the abilities of students taught with the STAD Model and have low social skills (Mean Diff = 10.12; significant = 0.003).
2. Based on the results of the Tukey test it can be concluded that there are significant differences between the ability of students taught with the STAD Model and have high social skills compared to the abilities of students taught with conventional models and have high social skills (Mean Diff = 14.04; significant = 0,000).
3. Based on the results of the Tukey test it can be concluded that there are significant differences between the ability of students taught with the STAD Model and have high social skills compared to the abilities of students taught with conventional models and have low social skills (Mean Diff = 13.93; significant = 0,000).

4.5 Discussion

Mathematics lessons a lot of material must be done by relying on high thinking so that mathematics is difficult for students, and causes boredom in learning. For this reason, teachers use interesting learning models to give good responses to students. The use of STAD type cooperative learning models to improve children's critical thinking about the learning process.

In the conventional learning model the teacher's responsibility in teaching students is quite large and the teacher's role in planning learning activities is very large, because in the conventional learning model the learning process is centered on the teacher while in the STAD type cooperative learning model students are stimulated to be able to solve problems, think at a high level , explore information, work together and improve communication skills through the role of the teacher as a guide. In this case learning activities are not entirely dependent on the teacher who is expected to make the classroom conditions interesting and fun.

Based on the results of research conducted obtained that the average mathematical critical thinking ability taught with the STAD type cooperative learning model is 87.42. Meanwhile, the average mathematical thinking ability of students taught with conventional learning models is 78.52. Therefore it can be said that the mathematics subject is more appropriate to be taught by using the STAD type cooperative learning model given the average thinking ability obtained by students is higher than the average thinking ability of students taught with conventional approaches or approaches that have so far been use by the teacher in mathematics.

Based on the results of the analysis during the research process, the researcher observed that each student had different abilities in understanding the lesson. The continuity of this study makes researchers closer to the object of the problem. The core problem found is the low level of students 'ability to think, students need to be stimulated by using a learning process that suits students' needs. Therefore, the STAD type cooperative learning model is allegedly able to help students easily understand concepts in mathematics. Based on these thoughts, it can be said that students' mathematical critical thinking ability will be better and improved if the teacher provides a good stimulus such as the STAD type cooperative model in helping the learning process.

V. Research Method

Based on the results of research and discussion, several conclusions can be drawn as follows:

1. The mathematical critical thinking ability of students taught with the STAD type cooperative learning model is higher than the mathematical critical thinking ability of students taught with the conventional model (F_{count} = 21.164 and the score of sig. 0.000> 0.05).
2. The mathematical critical thinking ability of students who have high social skills is higher than the mathematical critical thinking ability of students who have low social skills (F_{count} = 6.756 and score of sig. 0.012> 0.05).
3. There is an interaction between learning models and social skills in effecting the mathematical critical thinking ability of students (F_{count} = 7.054 and score of sig. 0.011> 0.05).

References

Agus Suprijono. (2009). *Cooperative Learning, Teori & Aplikasi PAIKEM*. Surabaya: Pustaka Pelajar.

Ahmad Susanto. (2014). *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Kencana Prenada Media Group.

Einav Aizikovitsh-Udi, Diana Cheng. (2015). Developing Critical Think-ing Skills from Dispositions to Abilities: Mathematics Education from Early Childhood to High School. *Creative Education, Towson University, USA*, 6, 455-462

Karunia, E. Lestari and M. Ridwan Yudhanegara. 2015. *Penelitian Pendidikan Matematika*. Bandung: PT Refika Aditama.

Kurniasih, Imas and Berlin Sani. (2016). *Ragam Pengembangan Model Pembelajaran untuk Peningkatan Profesionalitas Guru*. Surabaya: Kata Pena.

Sardiman, A.M. 2010. *Interaksi dan Motivasi Belajar Mengajar*. Jakarta: PT. Raja Grafindo Persada.

Suherman, Erman, et al. (2003). *Strategi Pembelajaran Matematika Kontemporer*. Bandung: JICA Universitas Pendidikan Indonesia.

Syahputra, Edi. (2013). Peningkatan Kemampuan Spasial Siswa Melalui Penerapan Pembelajaran Matematika Realistik. *Cakrawala Pendidikan.* 3: 354.

Trianto. (2007). *Model-model Pembelajaran Inovatif berorientasi kontruktivistik*. Prestasi Pustaka: Jakarta.