INCREASING STUDENT'S UNDERSTANDING OF MATHEMATICAL CONCEPT USING COOPERATIVE LEARNING AND SELF EFFICACY

Virgana
Universitas Indraprasta PGRI
Jl. Nangka Raya No.58 C, RT.5/RW.5, Tj. Bar., Kec. Jagakarsa, Kota Jakarta Selatan, Daerah Khusus Ibukota Jakarta 12530
Email: virganaunindra@gmail.com

Abstract

The aims of this study is to identify the influence of cooperative learning model of type numbered heads together (NHT) and self efficacy (SE) towards the understanding of mathematical concepts of State Junior High school students. This research uses experimental methods, namely by giving different treatment types on two groups of student. The analysis used in this study is a two-way ANOVA. Based on data analysis, we can conclude that there are: an influence of the cooperative learning model of type NHT towards student's mastery of mathematical concepts, an influence of SE towards student's mastery of mathematical concepts, and an influence of the interaction between cooperative learning model of type NHT and SE towards student's understanding of mathematical concepts. We hope that this study can be beneficial for further research to improve students' mastery of mathematical concepts.

Keywords*: Cooperative Learning, Mathematical Concepts Numbered Heads Together (NHT), Self Efficacy*

INTRODUCTION

Some schools in Indonesia still use conventional learning models because the teachers do not require special preparation which is very comfortable and it is the teachers who are usually active, so that the pupils remain passive learning. However, in accordance with the demands of the curriculum of 2013 the adult learning model that is required is a model of student-centered learning. Learning activity in the curriculum of 2013 uses a scientific approach or scientific process-based learning so that there is a change from conventional learning models to interactive learning models. Therefore we need a learning model to overcome these problems.

This study uses a cooperative learning model of type numbered heads together and a learning model of cooperative Jigsaw as the control class associated with self efficacy in State Junior High school in South Jakarta. Self efficacy is students' beliefs about their capabilities to complete a task successfully and student's goal orientation (i.e. students' reasons for doing a task (Al-baddareen, Ghaith, and Akour 2015), and it should be noted that self-efficacy variable can be correlated to other variables (Markazi, et al. , 2011). Self efficacy (SE) is a confidence of learners in doing something. Learners obtain information to appraise their self-efficacy from their actual performances, their vicarious experiences, the persuasions they receive from others, and their physiological reactions (Meral, Colak, and Zereyak 2012).

One aspect that can be improved through the coopertive learning model is understanding mathematical concept.Understanding mathematical concepts is one of the

thinking components of student in learning mathematics. There are structures (concepts) and relations in mathematics which is a structural system (Sengul and Katranci 2012). Academic self-concept is defined as self-peceived belies about traits and attributes and feelings about themselves as well as confidence level about their competence in a particular subject area (Wang and Lin 2008). A mathematical concept may be represented, for example through graphs, equations, or natural language. Any representation is always only one of the possible representations of the same concept (Nunes and Schliemann 1988).

Based on previous research cooperative learning models are widely used in research (Arnidha 2016; Atikasari and Woro Kurniasih 2015; Badrun and Hartono 2013; Heni 2014; Mukhoyyaroh and Jazil 2013; Negara, H. R., Atmojo, T., & Sujadi 2014; Nur Kesumaningrum and Syachruroji 2016; Putra 2015; Rahmawati and Mahmudi 2014; Rohika 2017; Sumarni and Susanti 2016; Susilo and Khabibah 2013; Tristanti 2017; Wardani 2015) and some studies to improve students conceptual understanding(Argikas and Khuzaini 2016; Astriani 2017; Dewi Purwanti, Dinda Pratiwi, and Rinaldi 2016; Herawati 2010; Mustofa, Susilo, and Muhdhar 2016; Putri 2015; Rukmansyah 2015; Sudarman and Vahlia 2016; Ulfaeni, Wakhyudin, and Saputra 2017).

The difference between this study and the previous one is that this research focused on using cooperative learning and self efficacy to increas student's understanding of mathematical concept. Then, this research is aim to know that is there any influence of the cooperative learning model of type NHT towards student's understanding of mathematical concepts. is there any influence of the SE towards student's understanding of mathematical concepts, And is there any influence in the interaction of cooperative learning model type NHT and SE towards student's understanding of mathematical concepts.

METHODE

This research uses experimental methods, namely by giving different treatment types on two groups of student. The analysis used in this study is a two-way ANOVA because of the usage of variable treatment cooperative learning and variable attributes SE. Each group (NHT) is then divided in two categories of groups of students with high and low SE, from another group (Jigsaw) are then divided in two categories of groups of students with high and low SE. Self efficacy are divided into two, namely high and low self efficacy (Kreitner and Kinicki 2007).

At the end of the experiments, both classes are given the same test instruments, then the results are analyzed and compared. Data collection techniques for self efficacy using a research instrument Likert-scale with five categories namely: the answer choices very agree; agree; neutral; do not agree; and strongly disagree. The answers are given the value of 5 to 1 for a positive statement, and the value of 1 to 5 for a negative statement, then the instrument is tested for validation. For the understanding of mathematical concepts, students are given an objective test with 40 multiple choice question in the

subject of "Geometry". This study uses a factorial study design 2 x 2 with experimental methods of treatment by level as shown in Table 1.

Table 1. Research design

Cooperative learning	**Self efficacy**		**Sum ∑ B)**
	High (A_1)	**Low (A_2)**	
NHT (B_1)	A1B1	A2B1	$\sum B_1$
Jigsaw (B_2)	A1B2	A2B2	$\sum B_2$
$\sum A$	$\sum A_1$	$\sum A_2$	A x B

Notes:

A1B1: Score of students' understanding of mathematical concept with NHT and high SE.

A1B2 : Score of students' understanding of mathematical concept with NHT and low SE.

A2B1: Score of students' understanding of mathematical concept with Cooperative Jigsaw and high SE.

A2B2: Score of students' understanding of mathematical concept with Cooperative Jigsaw and low SE.

RESULT AND DISCUSSION

Prior to hypotheses testing, we do the prerequisite test for data analysis first, namely data normality test and test for homogeneity of variance. Hypothesis testing is carried out by Two-way Anova analysis techniques with the help of SPSS. If the existence of interaction discovered after the calculation, then the testing will be continued with Tuckey test.

The results of the calculation of data normality test as students' achievements with a learning model cooperative type NHT is that the value of *Asymp. Sig.* (*2-tailed*) 0.064 > 0.05, meaning Ho is accepted and H1 is rejected. This means, that the data are originated from a population with normal distribution. The results of the calculation of data normality test as students' achievements with a learning model of Cooperative Jigsaw is that the value of *Asymp. Sig.* (*2-tailed*) 0.061 > 0.05, meaning Ho is accepted and H1 is rejected. This means, that the data are originated from a population with normal distribution. The results of the calculation of data normality test of students with high SE is that the value of *Asymp. Sig.* (*2-tailed*) 0.200 > 0.05, meaning Ho is accepted and H1is rejected. This means, that the data are originated from a population with normal distribution. The results of the calculation of data normality test of students with low SE is that the value of *Asymp. Sig.* (*2-tailed*) 0.061 > 0.05, meaning Ho is accepted and H1 is rejected. This means, that the data are originated from a population with normal distribution.

The results of the calculation of data normality test as students achievements with a learning model NHT and high SE is that value of *Asymp. Sig.* (*2-tailed*) 0.072 > 0.05,

meaning Ho is accepted and H1 is rejected. This means, that the data are originated from a population with normal distribution. The results of the calculation of data normality test as students achievements with a learning model NHT and low SE si that the value of *Asymp. Sig.* (*2-tailed*) 0.066 > 0.05, meaning Ho were accepted and H1 rejected. This means, that the data are originated from a population with normal distribution. The results of the calculation of data normality test as students' achievements with a learning model of Cooperative Jigsaw and high SE is that value of *Asymp. Sig.* (*2-tailed*) 0,062 > 0,05 , meaning Ho were accepted and H1 rejected. This means that the treatment population is normally distributed. The results of the calculation of data normality test as students' achievements with a learning model of Cooperative Jigsaw and low SE is that value of *Asymp. Sig.* (*2-tailed*) 0.075 > 0.05, meaning Ho ise accepted and H1 is rejected. This means, that the data are originated from a population with normal distribution. The test results for homogeneity of variance as students' achievements in cooperative learning model in treatment groups NHT (A1) and Cooperative learning with Jigsaw (A2) that significance value (Sig) *Levene Statistic Based on Mean* = 0,062 > 0.05 , meaning Ho is accepted and H1 is rejected. This means, that the data are originated from a population with a homogeneous variant. The test results for homogeneity of variance as students' achievements in students group of high SE (B1) and low SE (B2) are that the value of significance (Sig) *Levene StatisticBased on Mean* = 0,062 > 0.05, meaning Ho is accepted and H1 is rejected. This means, that the data are originated from populations with homogeneous variant.

Hypothesis testing is done by observing the output of the program SPSS 22 in the column of significance (Sig) which is contained in the table of *Tests of Between-Subjects Effects* for the row corresponding to each variable or group treatment and the interaction of these two variables. The criteria for conclusion of test hypotheses are as follows: If significance (Sig) < 0.05, then Ho is rejected and H1 is accepted, that means, there are differences in the average of students' test results with different learning models or different media as well as the interaction of different learning models and different media. Conversely, if the significance (Sig) > 0.05 then Ho is accepted and H1 is rejected, that means, that there are no difference in the average test results of students who learn with a different learning models or different media as well as in the interaction of different learning models and different media. There results of three hypotheses testing can be seen in Table 2.

Table 2. Results of analysis of variance from the results of student test in mastering mathematical concepts

Tests of Between-Subjects Effects					
Dependent Variable: Test-result					
Source	Sum of Squares	Df	Mean Square	F	Sig.
Corrected Model	7283.203[a]	8	910.400	67.934	.000
Intercept	390682.240	1	390682.240	29152.797	.000
Cooperative Learning (CL)	4904.810	2	2452.405	182.999	.000
SE	1380.832	2	690.416	51.519	.000
CL * SE	385.930	4	96.483	7.200	.000
Error	951.485	71	13.401		
Total	468037.500	80			
Corrected Total	8234.687	79			
a. R Squared = .884 (Adjusted R Squared = .871)					

Based on the results of the calculations in table 2, the results of each hypothesis testing are as follows:

The influence of learning model of CL towards the student's mastery of mathematical concepts. Statistical hypotheses are tested to find out about the influence of learning model towards the students' mastery of mathematical concept in Geometry.

H_0 : $\mu_{A1} = \mu_{A2}$ (There is no influence of cooperative learning model towards students' mastery of mathematical concepts)

H_1 : $\mu_{A1} \neq \mu_{A2}$ (There is an influence of cooperative learning model towards students' mastery of mathematical concepts)

It can be seen in table 2 that the significance value (Sig.) = 0,000 < 0,05. This shows that Ho is rejected and H1 is accepted, that means, there is an influence of cooperative learning model towards students' mastery of mathematical concepts.

Influence of SE towards student's mastery of mathematical concepts

Statistical hypotheses are tested to find out about the influence of media learning towards students' mastery of mathematical concepts.

H_0: $\mu_{B1} = \mu_{B2}$ (There is no influence of SE towards students' mastery of mathematical concepts)

H_1 : $\mu_{B1} \neq \mu_{B2}$ (There is an influence of SE towards students' mastery of mathematical concepts)

It can be seen in table 2 that the value of significance (Sig.) SE = 0,000 < 0,05. This shows that Ho is rejected and H1 is accepted, that means there is an influence of SE towards students' mastery of mathematical concepts.

The influence of interaction between CL and SE towards students' mastery of mathematical concepts.

Statistical hypotheses are tested to find out about the influence of learning model towards students' mastery of mathematical concepts.

H_0 : $\mu_{Int.A\times B} = 0$ (There is no influence of interactions between CL and SE towards students' mastery of mathematical concepts),

H_1 : $\mu_{Int.A\times B} \neq 0$ (There is an influence of the interactions between CL and SE towards students' mastery of mathematical concepts). It can be seen in table 2 that the value of significance (Sig.) CL*SE (interactions CL and SE) = 0,000 < 0,05. This shows that Ho is rejected and H1 is accepted, that means there is an influence in the interaction between CL and SE towards students' mastery of mathematical concepts.

Hypothesis testing through ANOVA proves the influence of the interaction between learning models of CL and SE towards students' mastery of mathematical concepts. Due to the interaction between the two treatments, then a follow-up test is done to know the *simple effects* among the sub-sub factors (treatment) which build the interaction.

Advanced test Interaction between CL and SE towards students' mastery of mathematical concepts. As already expressed earlier, further tests done after proven that treatment between CL and SE and its interactions has significant influence towards students' mastery of mathematical concepts. Further tests in this study usingTukey Test (HSD = *Honest Significance Difference*). In the research design with the design factor of 2 × 2, there are four hypotheses that need to be tested in advanced trials. The statistical hypothesis in general are expressed as follows:

H_0 : $\mu_1 = \mu_2$ (The average value of the test results of students with learning model CL or high SE is the same as students who learn with CL or low SE).

H_1 : $\mu_1 > \mu_2$ (The average value of the test results of students with learning model CL or high SE is higher than students who learn with CL or low SE).

Table 3. Further test results of influence of the interaction of learning model towards students' mastery of mathematical concepts.

Multiple Comparisons						
Test result Tukey HSD						
(I) MODEL	(J) MODEL	Mean Difference (I-J)	Std. Error	Sig.	95% Confidence Interval	
					Lower Bound	Upper Bound
NHT - High SE	NHT- low SE	10.8791*	1.60921	.000	6.6521	15.1062
	Jigsaw - high SE	16.2500*	1.34636	.000	12.7134	19.7866
	Jigsaw - low SE	24.6291*	1.60921	.000	20.4021	28.8562
NHT - Low SE	NHT - high SE	-	1.60921	.00	-15.1062	-6.6521

		10.8791*		0		
	Jigsaw - high SE	5.3709*	1.60921	.007	1.1438	9.5979
	Jigsaw - low SE	13.7500*	1.83478	.000	8.9304	18.5696
Jigsaw - High SE	NHT - high SE	-16.2500*	1.34636	.000	-19.7866	-12.7134
	NHT - low SE	-5.3709*	1.60921	.007	-9.5979	-1.1438
	Jigsaw - low SE	8.3791*	1.60921	.000	4.1521	12.6062
Jigsaw - Low SE	NHT - high SE	-24.6291*	1.60921	.000	-28.8562	-20.4021
	NHT - low SE	-13.7500*	1.83478	.000	-18.5696	-8.9304
	Jigsaw - high SE	-8.3791*	1.60921	.000	-12.6062	-4.1521
Based on observed means. The error term is Mean Square(Error) = 23.565.						
*. The mean difference is significant at the 05 level.						

Criteria of conclusion in an advanced test (Tukey Test) are as follows: If the value of significance (Sig.) < 0.05 then Ho is rejected and H1is accepted, that means that the Tukey test results is significant. Conversely, if the value of significance (Sig.) > 0.05 then Ho is accepted and H1 is rejected, that means thatTukey Test results is not significant. Conclusion of Tukey tests for each of the sub factors are as follows:

The average value of the test results of students with a learning model cooperative type NHT with high SE is 10.88 higher than students results with a learning model cooperative type NHT with low SE which is 16.25 but it is higher than students results with learning model of cooperative Jigsaw with high SE. It is also higher 24.63 of the students with learning model Cooperative Jigsaw with low SE. This difference is significant or real because the level of significance (Sig.) from all the difference is each of 0.000 < 0,05. It can be inferred that the test results of students with a learning model of cooperative type NHT with high SE significantly higher than the test results of students with the learning model of cooperative type NHT with low SE, learning model of Cooperative Jigsaw and high SE, and learning model of Cooperative Jigsaw with low SE.

The average value of the test results of students who studied with cooperative learning model type NHT with low SE 5,37 is higher than students's results with learning model Cooperative Jigsaw with high SE is 13,75 higher than students with learning model cooperative Jigsaw with low SE. This difference is significant or real because of the level of significance (Sig.) both differences of each is 0,000 or 0,007 < 0,05. It can be concluded that the test results of students with a learning model cooperative type NHT with low SE is higher than the test results of students who learn with learning model Cooperative Jigsaw with high SE, and cooperative learning model Jigsaw with low SE.

The average value of the test results of students with learning model Cooperative Jigsaw with high SE is 8.34 higher than students who learn learning model Cooperative Jigsaw with low SE. This difference is significant or real because the level of significance (Sig.) 0,000 < 0,05. It can be concluded that the test results of students who study with a model Cooperative Jigsaw with high SE is higher than the test results of students who learn by learning model Cooperative Jigsaw is higher than the test results of students who learn by learning model Cooperative Jigsaw with low SE.

The average value of the test results of students who learn with learning model Cooperative Jigsaw with low SE is 24.63 lower than the students who studied with cooperative learning model type NHT with high SE is 13.75 lower than students who learn with learning model cooperative type NHT with low SE, and 8.38 lower than students who learn with learning model Cooperative Jigsaw with high SE. This difference is significant because of the level of significance (Sig.) all the differences of each is 0,000 < 0,05. It can be concluded, that the test results of students who learn with learning model Cooperative Jigsaw with low SE is lower than the test results of students with cooperative learning NHT.

The results of hypothesis testing shows that all of three zero hypothesis are rejected. Thus, all of the alternative hypothesis are accepted. The test results and a discussion of each of these factors or treatment in this study are discussed in the following. There is a difference between test results of students who studied with cooperative learning model NHT and Jigsaw model.

The results of Variant analysis (ANOVA) as can be seen in Table 3 indicates that the average value of the mastery of mathematical concept of student with learning model cooperative type NHT is 83,50 which is significant, because it is higher than the average value of the test results of students who learn with learning model Cooperative Jigsaw, which is 68,13. This is shown by the significance value (Sig.) = 0,000 < 0,05, that means that Ho is rejected and H1 is accepted. This means that there is an influence of cooperative learning model type NHT towards student's mastery of mathematical concept. These results correlate with the objective of cooperative learning model type NHT which is to increase learning outcome of students, and students can experience a diversity of learning styles from the classmates, as well as developing social skills. In addition, cooperative learning model type NHT is also designed to overcome weaknesses or complaints from teacher who used to have ordinary group discussion with some disadvantages like: (1) waste of time; (2) students cannot cooperate with friends effectively in groups; (3) students who are less good or less diligent will feel inadequate in collaboration with his friends; and (4) a rowdy classroom situation may occurs.

Based on the results of these variants can be inferred that there is a difference in student's mastery of mathematical concept among students who studied with cooperative learning model type NHT and students who learn with learning model Cooperative Jigsaw. Some previous studies have been conducted by several researchers.The results obtained showed that the value of t test = 3,487> t table = 1.669 with a degree of freedom (n-2) = 72-2 = 70 on the one hand test with significance level

of 5%. It turned out that t test > t table means Ha accepted, so it can be concluded that there are significant model of Numbered Heads Together toward mastery of math concepts of students in the experimental class (Rusmini and Surya 2017). It can be said that the learning achievement of students in mathematics can be improved with the application of cooperative learning with the type of Number Heads Together (Nasrun 2016). So it could be concluded that students who use the learning portfolio based NHT had reached the learning outcome in line with the individually and classical (Yustitia 2017), and the testing criteria were if –t-table ≤ t-hit ≤ +ttabel (1 - α), (n1 + n2 – 2) H0 is accepted and Ha is rejected. Based on the results obtained by -1.67 <48.22> +1.67 for the class experiment 1 which shows that clearly was in the region so that H0 is rejected and Ha is accepted, it means that a learning model NHT has influence on student learning outcomes (Batlolona et al. 2018) There is a difference between students achievement with high SE dan low SE

The results of the analysis Variant (ANOVA) as can be seen in the Table2 shows that the average value of student's mastery of mathematical concepts with high SE is 79.18 which is significantly higher than the average value of the test results of students who studied with low SE, that is 69,55. This is shown by the significance value (Sig.) SE = 0,000 < 0,05 that means that Ho is rejected and H1 is accepted. This means that there is an influence of learning model SE towards student's mastery of mathematical concepts. Self efficacy is also needed in life that if a student has good confidence in doing a task, then he will become successful. An example, a student who is not particularly gifted in a certain subject but believe in his/her own ability to learn it well, he will become sucsessfull. On the contrary, if a student has low efficacy, he does not have confidence in doing a job and he would fail. Successful efficacy builders do more than convey positive appraisals. In addition to raising people's beliefs in their capabilities, they structure situations for them in ways that bring success and avoid placing people in situations prematurely where they are likely to fail often (Bandura 1998). Students' SE scores were also correlated with their mathematical outcome attainment variable (i.e. AS grade). Statistically significant positive correlations were also found, suggesting that the Mathematics Self Efficacy score of the students can predict their achieved grade (Pampaka, Kleanthous, and Hutcheson 2011), math self-efficacy might mediate the effect of student perceptions of performance-orientation on standardized math test performance (Fast et al. 2010). Statistically significant differences were also found according to place of living: mathematics self-efficacy ($p<0.001$), self-concept ($p=0.001$) and anxiety ($p=0.003$). In provincial towns and country, students' mathematics anxiety is lower than in towns but students' mathematics self-efficacy and self-concept are higher (Kvedere 2014).

Based on the results of these variants it can be inferred that there is a difference in mastery of mathematical concepts between students who have high SE and low SE. There is an influence in the interaction between CL and SE towards students's understanding of mathematical concepts

The results of the analysis Variant (ANOVA) as can be seen in the Tabel 2 indicates that there is a significant influence in the interactions between the learning

model cooperative type NHT and high SE towards student's mastery of mathematical concepts. This is proved by the significance value (Sig.). CL * SE (interaction CL and SE) = 0,000 < 0,05 that shows that Ho is rejected and H1 is accepted. Thus, it is evident that there is a significant influence in the interactions between the learning model cooperative type NHT and high SE towards student's mastery of mathematical concepts. By using the advanced test of Tukey is also proven, that the test results of students who studied with cooperative learning model type NHT with high SE is higher than the test results of students who studied with Cl and low SE.

The approach of CL and high SE separatedly have been proven to have significant influence in enhancing students' mastery of mathematical concepts. When both treatments combined, namely learning math with CL and high SE, it is apparently proven to improve students' mastery of mathematical concepts. Thus, it can be concluded that there is an influences in learning with model cooperative interaction of type NHT and high SE in towards student's mastery of mathematical concepts. The average score of students' achievement of moderate prior knowledge of mathematics was better than low prior knowledge of mathematics students if the students who were taught by the combination of NHT-Cooperative Jigsaw types of cooperative learning model had significantly different effect (Maonde and Ekadayanti 2016), There is an influence of the interaction model of cooperative learning and self efficacy towards students' results in learning mathematics (Yunianti and Jaeng 2016), and (Sari 2016).

Implication of the findings

Based on the results of the findings in this study, we can enhance student's achievements in mastering mathematical concepts using cooperative learning in order to face the need which is implemented in the curriculum of 2013. To achieve that goal, it is important to involve all stake holders, students, teachers, principals, community, parents, and even provincial education service to be involved in the design of the cooperative learning model. In the framework of teacher improvement in the management of learning, training of teachers about learning models at national or provincial level, post-graduate training activities are required in the form of controlling in the implementation. Furthermore, we need a training program as follow-up to discuss the problems encountered by the teacher at school. The government of Indonesia should provide some relevance infrastructures in supporting the implementation of the new curriculum (curriculum of 2013) especially in regions outside of Java island.

CONCLUSION

Based on the results of hypothesis testing and discussion of the study, we can conclude that in improving students' understanding of mathematical concepts, it would be more effective if done with variations model of teaching such as model of cooperative learning NHT or Jigsaw. The more capable a teacher selecting model of teaching and how to teach, the higher is students' understanding of mathematical concepts. Teachers, parents, and school should encourge students with low self efficacy and give them motivation to increase their confident in order to get a better results in

lesson especially in Mathematics. We also suggest that policy makers, teachers, and parents should consider an improved collaborated mathematics lesson in designing the policies and in the implementation of new curricula needed in educational system in Indonesia. It is therefore expected, that the findings of this research will be useful for teachers, school principal, policy maker, or other researchers who are interested in this research to be developed in further research.

DAFTAR PUSTAKA

Al-baddareen, Ghaleb, Souad Ghaith, and Mutasem Akour. 2015. "Self-Efficacy , Achievement Goals , and Metacognition as Predicators of Academic Motivation." *Procedia - Social and Behavioral Sciences* 191(2015): 2068–73.

Argikas, Tatag Bagus, and Nanang Khuzaini. 2016. "Penerapan Model Pembelajaran Reciprocal Teaching Untuk Meningkatkan Pemahaman Konsep Matematika Siswa Kelas Vii SMP Negeri 2 Depok." *Jurnal Mercumatika* 1(1): 67–79.

Arnidha, Y. 2016. "Peningkatan Kemampuan Representasi Matematis Melalui Model Pembelajaran Kooperatif Think Pair Share." *Jurnal e-DuMath* 2(1): 128–37. http://ejournal.stkipmpringsewu-lpg.ac.id/index.php/edumath.

Astriani, Linda. 2017. "Pengaruh Pembelajaran Reciprocal Teaching Terhadap Kemampuan Pemahaman Konsep Matematika Ditinjau Dari Kemampuan Awal Matematika Siswa." *Jurnal Pendidikan Matematika dan Matematika* 3(1): 77–85.

Atikasari, Gias, and Ary Woro Kurniasih. 2015. "Keefektifan Model Pembelajaran Kooperatif Dengan Strategi TTW Berbantuan Geogebra Terhadap Kemampuan Berfikir Kreatif Matematis Siswa Kelas VII Materi Segitiga." *Unnes Journal of Mathematics Education* 4(1): 86–94.

Badrun, and Hartono. 2013. "Keefektifan Metode Pembelajaran Kooperatif Model STAD Ditinjau Dari Prestasi Dan Motivasi Belajar Siswa Di Kelas VIII SMP." *PYTHAGORAS: Jurnal Pendidikan Matematika* 8(2): 120–34.

Bandura, Albert. 1998. "Self-Efficacy." In *Encyclopedia of Human Behavior*, San Diego: Academic Press, 71–81.

Batlolona, John Rafafy, Rufinah. S, Siti Nuryanti, and Kasmudin Mustapa. 2018. "Effect of Number Head Together and Talking Stick Types of Cooperative Learning Model on Redoks Towards Student ' S Motivation and Learning Outcomes." *Advances in Social Science, Education and Humanities Research*, 174(October): 447–51.

Dewi Purwanti, Ramadhani, Dona Dinda Pratiwi, and Achi Rinaldi. 2016. "Pengaruh Pembelajaran Berbantuan Geogebra Terhadap Pemahaman Konsep Matematis Ditinjau Dari Gaya Kognitif." *Al-Jabar* 7(1): 115–22.

Fast, Lisa A. et al. 2010. "Does Math Self-Efficacy Mediate the Effect of the Perceived Classroom Environment on Standardized Math Test Performance ?" *Journal of Educational Psychology* (May 2014): 1–47.

Heni, Dwi Mei. 2014. "Efektivitas Model Pembelajaran Kooperatif Tipe Student Teams Achievement Divisions (STAD) Yang Dimodifikasi Dengan Tutor Sebaya Ditinjau Dari Kecerdasan Majemuk Siswa." *Jurnal Edutama* 1(1): 1–7.

Herawati, O. 2010. "Pengaruh Pembelajaran Problem Posing Terhadap Kemampuan Pemahaman Konsep Matematika Siswa Kelas XI IPA SMA Negeri 6 Palembang." *Jurnal Pendidikan Matematika* 4(1): 70–80.

Kreitner, Robert, and Angelo Kinicki. 2007. *English, Book, Illustrated Edition: Organizational Behavior*. Boston, Mass. ; London : McGraw-Hill Irwin.

Kvedere, Liene. 2014. "Mathematics Self-Efficacy , Self-Concept and Anxiety Among 9 Th Grade Students in Latvia." *Procedia - Social and Behavioral Sciences* 116(2014): 2687–90.

Maonde, Faad, and Waode Ekadayanti. 2016. "The Effect of Combination of Cooperative Learning Models and Prior Knowledge of Mathematics on Students ' Achievement." *International Journal of Contemporary Applied Sciences* 3(5): 8–27.

Markazi, Leili, Rahim Badrigargari, and Shahram vahedi. 2011. "The Role of Parenting Self-Efficacy and Parenting Styles on Self- Regulation Learning in Adolescent Girls of Tabriz ." *Procedia - Social and Behavioral Sciences* 30(2011): 1758–60.

Meral, Mustafa, Esma Colak, and Ertan Zereyak. 2012. "The Relationship between Self-Efficacy and Academic Performance." *Procedia - Social and Behavioral Sciences* 46(2012): 1143–46.

Mukhoyyaroh, Siti, and Syaiful Jazil. 2013. "Pengaruh Model Pembelajaran Kooperatif Tipe TPS (Think Pair Share) Terhadap Pemahaman Siswa Pada Mata Pelajaran Fiqih Kelas VII MTS Al-Irsyadiyah Dermolemahbang Sarirejo Lamongan." *Jurnal Pendidikan Agama Islam* 1(1): 23–44.

Mustofa, Zainul, Herawati Susilo, and Mimien Heni Irawati Al Muhdhar. 2016. "Penerapan Model Pembelajaran Problem Based Learning Melalui Pendekatan Kontekstual Berbasis Lesson Study Untuk Meningkatkan Kemampuan Memecahkan Masalah Dan Hasil Belajar Kognitif Siswa SMA." *Jurnal Pendidikan : Teori, Penelitian, dan Pengembangan* 1(5): 885–89.

Nasrun. 2016. "The Use of Cooperative Learning With Number Head Together Model to Improve the Students ' Mathematics Subject." *IOSR Journal of Mathematics* 12(5): 113–17.

Negara, H. R., Atmojo, T., & Sujadi, I. 2014. "Eksperimentsi Model Pembelajaran Kooperatif Tipe Jigsaw Dengan Pendekatan CTL Terhadap Prestasi Belajar Dan Aspek Afektif Siswa Pada Materi Bangun Ruang Sisi Datar DItinjau Dari Kemampuan Spasial." *JMME* 4(2): 47–63.

Nunes, Terezinha, and Analucia Schliemann. 1988. "Mathematical Concepts in Everyday Life." In *New Directions Lor Child Developmen*, San Francisco: Jowy-Basr, 87.

Nur Kesumaningrum, Citra, and A Syachruroji. 2016. "Perbedaan Hasil Belajar Kognitif Siswa Menggunakan Model Pembelajaran Kooperatif Tipe Make A Match Dan Ekspositori Pada Konsep Energi." *JPSD* 2(2): 181–91.

Pampaka, Maria, Irene Kleanthous, and Graeme D Hutcheson. 2011. "Research in Mathematics Education Measuring Mathematics Self-Efficacy as a Learning Outcome." *Research in Mathematics Education* 13(2): 169–90.

Putra, Fredi Ganda. 2015. "Eksperimentasi Model Pembelajaran Kooperatif Tipe Teams Games Tournament (TGT) Berbantuan Software Cabri 3d Di Tinjau Dari Kemampuan Koneksi Matematis Siswa." *Al-Jabar: Jurnal Pendidikan Matematika* 6(2): 143–53.

Putri, Finoli Marta. 2015. "Pengaruh Penerapan Kombinasi Metode Inkuiri Dan Reciprocal Teaching Terhadap Capaian Pemahaman Konsep Siswa." *Edusains* 7(1): 18–26.

Rahmawati, Rina Dyah, and Ali Mahmudi. 2014. "Keefektifan Pembelajaran Kooperatif STAD Dan TAI Ditinjau Dari Aktivitas Dan Prestasi Belajar Matematika Siswa." *Jurnal Prima Edukasia* 2(1): 102–15.

Rohika, Desak Putu. 2017. "Peningkatan Hasil Belajar IPA Melalui Penerapan Model Kooperatif Tipe Student Teams Achievement Divisions (STAD) Pada Siswa Kelas IV SD No.2 Beng Gianyar Tahun Pelajaran 2015/2016." *Jurnal Ilmiah Sekolah Dasar* 1(2): 221–28.

Rukmansyah, Enjah Takari. 2015. "Penggunaan Media Instan Dan Pendekatan Somatic Auditory Visual Intellectual (SAVI) Untuk Meningkatkan Pemahaman Konsep Kalor." *Jurnal Pengajaran MIPA* 20(1): 43–47.

Rusmini, and Edy Surya. 2017. "The Effect of Numbered Heads Together Model Against Students ' Mathemacal Concept Mastery in SMP Negeri 8 Medan." *IJARIIE* 3(2): 3433–40.

Sari, Royhana Novita. 2016. "The Influence Of Learning Methods Against The Ability Of The Settlement Terms Of Mathematics Self-Efficacy." *Jurnal Pendidikan Dasar* 7(2): 297–310.

Sengul, Sare, and Yasemin Katranci. 2012. "Metaphors That Prospective Primary School Teachers Possess on the Concept of 'Mathematics.'" *Procedia - Social and Behavioral Sciences 4* 46(2012): 1470–75.

Sudarman, Satrio Wicaksono, and Ira Vahlia. 2016. "Efektifitas Penggunaan Metode Pembelajaran Quantum Learning Terhadap Kemampuan Pemahaman Konsep Matematis Mahasiswa." *Al-Jabar: Jurnal Pendidikan Matematika* 7(2): 275–82.

Sumarni, and Nora Susanti. 2016. "Penerapan Metode Pembelajaran Kooperatif Tipe Student Teams Achievement Divisions (STAD) Untuk Meningkatkan Hasil Belajar Mahasiswa Pada Mata Kuliah Perencanaan Pembelajaran Ekonomi." *Economica* 4(1): 109–23.

Susilo, Yudi, and Siti Khabibah. 2013. "Peningkatan Motivasi Belajar Siswa Melalui

Model Pembelajaran Kooperatif Tipe Numbered Head Together (Nht) Materi Ajar Perbandingan Dan Fungsi Trigonometri Pada Siswa Kelas X." *MATHEdunesa* 2(2): 1–8.

Tristanti, Lia Budi. 2017. "Pengaruh Model Pembelajaran Kooperatif Tipe TAI Dan Problem Based Learning (PBL) Terhadap Pemahaman Konsep Bangun Ruang Siswa." *Jurnal Pendidikan Matematika FKIP Univ. Muhammadiyah Metro* 6(3): 338–49.

Ulfaeni, Siti, Husni Wakhyudin, and Henry Januar Saputra. 2017. "Pengembangan Media Monergi (Monopoli Energi) Untuk Menumbuhkan Kemampuan Pemahaman Konsep IPA Siswa SD." *Profesi Pendidikan Dasar* 4(2): 136–44.

Wang, J., and E Lin. 2008. "Re-Examining the Self-Concept and Mathematics Achievement Relationship Using Comperative Studies." : 11th International Congress on http://dg.icme11.or.

Wardani, Dian Trisna. 2015. "Pengaruh Pembelajaran Kooperatif Tipe STAD (Student Teams Achievement Divisions) Dan Jigsaw Terhadap Prestasi Belajar Ekonomi Ditinjau Dari Motivasi Belajar Siswa Tahun Ajaran 2014/2015." *Equilibrium* 3(2): 105–12.

Yunianti, Elis, and Maxinus Jaeng. 2016. "Influence Model Of Learning And Self-Efficacy Against The Results Of Learning Math SMAN 1 PARIGI." *e-Jurnal Mitra Sains* 4(1): 8–19.

Yustitia, Via. 2017. "Comparison of Students' Reasoning Skills between 'Numbered Head Together' and 'Think Pair Share' Based on Portfolio." *Atlantis Press* 158(Ictte 2017): 790–94.