Influence on The Use of Problem Based Learning Models on Mathematical Creative Thinking Ability Students are Reviewed from The Cognitive Style and School Level in Class VIII MTsN Tanah Datar

Fuji Marselina, Hendra Syarifuddin

Abstrac: This research aimed to find out the effect of the use of problem based leaning models for students' mathematical creative thinking abilities in terms of cognitive style (field independent and field dependent) an school level (high, medium, and low) of VIII grade students of Tanah Datar. This type of research is experimental research. The research sample consisted of 90 students from high, medium and low school levels. The data analysis technique used t-test and mann-whitney test with the help of SPSS 18 by conducting a prerequisite test in the form of a normality test and a homogeneity test first. The results showed that: (1) the mathematical creative thinking ability of students with FI and FD cognitive styles who learned to use the PBL model was higher than those who learned using conventional learning,(2) the mathematical creative thinking ability of students who learned to use the PBL model was higher than those who learned to using conventional learning at medium and low school levels ecpect at the high school level, (3) there is no interaction between the learning models and cognitive styles in influencing students' mathematical creative thinking abilities , dan (4) there is no interaction between the learning models and school level ini influencing students' mathematical creative thinking abilities.

Index Terms: Mathematical Creative Thinking Abiity, Cognitive Style, School Level, Problem Based Learning Model
.

1. INTRODUCTION

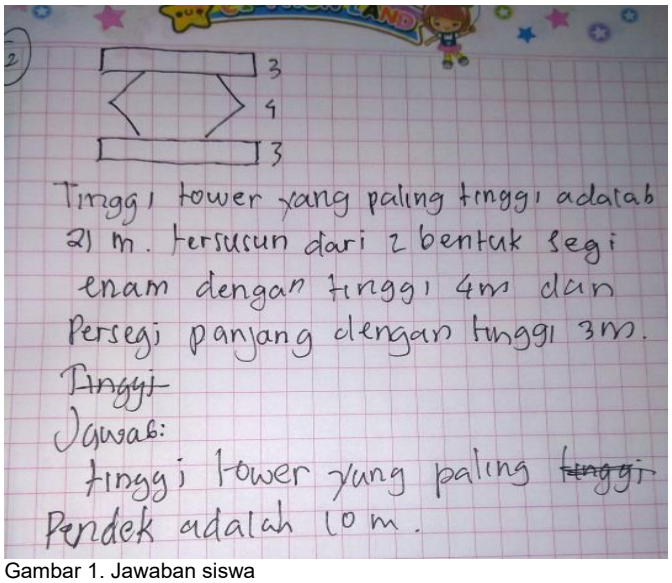
Entering the 21st century, better known as the century of knowledge or the millennium, the demands of learning are also changing. 21st Century learning uses a term known as 4Cs (Critical thinking, communication, collaboration, and creativity), which are four abilities that have been identified as 21st century abilities (P-21) as abilities that are very important and are needed today [1] That is, the ability to think creatively one of the very important abilities developed in learning including mathematics learning. In addition, students' mathematical creative thinking skills are important to develop because these abilities are important abilities students have in solving mathematical problems [2].

The ability to think creatively is one of the abilities to think at a higher level, namely a thought process that does not merely memorize and relay information known, so this ability needs to be developed in learning. The ability to think mathematically creative is defined as the ability to find varied solutions that are new to mathematical problems that are open easily and flexibly, but the truth can be accepted [3]. This indicates that students' mathematical creative thinking skills are very necessary both for the present and the future, especially in a changing world situation.

The importance of the ability to think mathematically creative can be supported by the many studies that discuss this ability. This research shows the low ability of students' mathematical creative thinking. One of the results of the study states that the learning process of students has not shown an attitude of curiosity, this is indicated by the lack of active students in asking questions in the learning process. This shows that the indicators in the ability to think creatively and curiosity in class VII SMP Negeri 3 Semarang have not been reached optimally [4]. In line with the above research, students' creative thinking abilities in the aspects of authenticity, fluency, flexibility and sensitivity in the Madrasah Tsanawiyah Negeri (MTsN) Cikembar, Sukabumi Regency are classified as low [5].

This is also supported by the results of field test results in class VIII.2 MTsN 1 Tanah Datar using questions that are in accordance with indicators of mathematical creative thinking ability, obtained answers as follows:

- *Fuji Marselina, Student of Mathematics Education Department, Padang State University, Indonesia. E-mail:fujimarselina78@gmail.com*
- *Hendra Syarifuddin, Lecturer in the Department of Mathematics Education, State University of Padang, Indonesia. E-mail: hendras@fmipa.ac.id*



Gambar 1. Jawaban siswa

The ability to think creatively mathematically is needed to generate ideas in an effort to solve a mathematical problem, from observations and explorations made and linking the situation at hand with mathematical knowledge possessed. In addition, students also experience problems in coherently outlining the steps of problem solving that are seen from students only directly using all the problem concepts without describing one by one each concept contained in the problem, and students also provide one problem solving solution so that it does not meet the indicators mathematical creative thinking, namely orginality and elaboration. This indicates that the mathematical creative thinking ability of mathematical students of MTsN 1 Tanah Datar students is still low.

Iwan Pranoto said that the low mathematical creative thinking ability of students is caused by several things, namely the ability of students to solve problems that demand high thinking and reasoning abilities are still very low and this is because the learning process that has been emphasized at school makes students emphasized to memorize formulas rather than understand the concept so that the result in low student achievement in mathematics [6]. In addition, the learning model that is used does not support students' mathematical creative thinking abilities, so a student-centered learning model is needed to improve it.

In choosing a learning model, there are things to consider and consider, namely the cognitive style and school level of students. Cognitive style is related to one of the factors that affect students' mathematical abilities and student characteristics. Cognitive style is a typical way for students to learn, both related to how information is received and processed, attitudes toward information, and habits related to the learning environment. Cognitive style is an individual characteristic in thinking, feeling, remembering, solving problems, and making decisions[7].Cognitive style is distinguished based on differences in psychological aspects, namely: cognitive style Field Independent (FI) and Field Dependent (FD). Field independent cognitive style is the cognitive style of a person with a high level of independence in observing a stimulus without being dependent on the teacher. While the field dependent cognitive style that is one's cognitive style tends to be and is highly dependent on the source of information from the teacher [8]. The results show, if the teaching style matches the cognitive style of students, the learning process becomes more productive and valuable [9]. In addition, based on research I Ketut developed capabilities and problem-based learning models interact significantly with cognitive styles [10].

School level is divided into three levels, namely high, medium and low level schools. Ismaimuza in his research in developing mathematical abilities consider high, medium and low school levels in addition to initial abilities. His research results that mathematics ability at each school level is different, namely for high school level with medium school level and high school level with low school level, whereas for medium school level with low school level is not different [11]. Tatang shows that there are interactions between learning variables and school level on students' mathematical creative thinking abilities [12].

Based on the state of students' mathematical creative thinking ability above and by paying attention to cognitive style and school level, the learning that takes place at school needs to be revised so that it can optimize the ability of mathematical creative thinking. One model that can be developed is the Problem Based Learning (PBL) model. PBL model is a model that begins with learning characterized by giving problems to be solved by students. According to Ibrahim and Nur, problem-based learning is one approach that stimulates students' higher-order thinking in situations oriented to real-world problems, including learning how to learn [13]. That is, the PBL model can improve students' mathematical creative thinking abilities, because it is one of the higher-level thinking skills.Real and complex problems in problem based learning can motivate students to identify and examine the concepts and principles they need in order to develop through these problems [14].

PBL models aim to help students develop / enhance creative thinking skills, foster student initiative at work, internal motivation in learning, and can develop interpersonal relationships in problem solving skills in group work [15]. When given a mathematical problem students are required to be able to understand, reason and be creative in problem solving so as to improve students' mathematical creative thinking abilities. This is also supported by the results of Elizabeth and Sigahotong's research which found that students who learned to use PBL learning models showed better creative thinking skills compared to students who learned to use expository models [16].

Researchers in this study tested mathematics learning by using problem-based learning on students' mathematical creative thinking abilities in terms of cognitive style and

school level. Based on the description above, this study aims to look at differences in students' mathematical creative thinking abilities in terms of cognitive style and school level of eighth grade students of MTsN Tanah Datar District.

2. LITERATURE REVIEW

2.1 Problem Based Learning

roblem-based learning is basically a learning model that directs learners to solving problems that have the characteristics of presenting problems at the beginning of learning. According to Tan, PBL is an innovation in learning because in problem-based learning students' thinking abilities are truly optimized through systematic group or team work processes, so students can empower, hone, test, and develop their thinking skills continuously [15]. Following the PBL model syntax:

TABLE 1
SCHOOL LEVEL GROUPING CRITERIA

Phase	Indicator	Teacher's Behavior
1	Student orientation to problems	Explain learning objectives, explain the logistics needed, and motivate students to engage in problem solving activities
2	Organizing students to learn	Helps students define and organize learning tasks related to the problem
3	Guiding individual and group experiences	Encourage students to gather appropriate information, conduct experiments to get explanations and problem solving
4	Develop and present the work	Assist students in planning and preparing appropriate work such as reports, and helping them with various assignments with their friends
5	Analyze and evaluate the problem solving process	Helping students to reflect or evaluate their investigation and the process they use

Source: Rusman [13]

2.2 Convensional Learning

Conventional learning is one of the learning models that is still valid and is very widely used by teachers. The conventional learning process is characterized by exposure to a concept or material that is accompanied by an explanation, as well as the division of tasks and exercises from the beginning to the end of the learning process.

2.3 Mathematical Creative Thinking Learning

Every student must think creatively in order to be able to solve problems that are both routine and non-routine problems. According to Evans creative thinking is a mental activity to make relationships that are continuous (continuous) so that the combination is found "right" or until someone gives up [17]. Mathematical creative thinking ability of students has four indicators, namely fluency thinking skills, thinking skills, flexibility, original thinking skills and elaboration skills. However, in this study, researchers only examined three indicators namely fluency, flexibility, and elaboration.

2.4 Cognitive Style

Cognitive style is an individual characteristic in thinking, feeling, remembering, solving problems, and making decisions [9]. Cognitive style can be divided into two, namely independent field as one's cognitive style with a high level of independence in observing a stimulus without dependence from the teacher and field dependent as one's cognitive style tends to and is highly dependent on the source of information from the teacher [9].

2.5 School Level

Another factor that will be considered in this study. The school level used consists of high, medium and low school levels.

3. METHODOLOGY

This type of research used in this research is experimental research. This research was conducted in two sample groups namely the experimental group who were given treatment in the form of problem-based learning and the control group that learned to use conventional learning. The population in this study were eighth grade students of MTsN in Tanah Datar District from 17 schools which were classified into high, medium and low level schools. The grouping of schools is carried out as in Table 2.

TABLE 2
SCHOOL LEVEL GROUPING CRITERIA

Value Limits	Slant
$x \geq (\bar{x} + SD)$	High level
$(\bar{x} - SD) < x < (\bar{x} + SD)$	Medium Level
$x \leq (\bar{x} - SD)$	Low level

Source: Arikunto [18]

Based on calculations performed as Table 1, there were 3 schools included in the high level, 10 schools included in the moderate level and 4 schools included in the low level, then each school was chosen for each level to be used as a research site. This school selection technique uses a purposive sampling technique so that selected MTsN 16 Tanah Datar as a high level school, MTsN 1 Tanah Datar as a medium level school and MTsN 7 Tanah Datar as a low level school. Based on the consideration of distance and teaching time, class VIII.B was chosen as the experimental class and class VIII.A as a control class for MTsN 16 Tanah Datar, class VIII.3 as an experimental class and class VIII.4 as a control class for MTsN 1 Tanah Datar and class VIII.1 as the experimental class and class VIII. 3 as a control class for MTsN 7 Tanah Datar. The total sample in this study amounted to 90 students.

Instrumen dalam penelitian ini adalah tes kemampuan The instruments in this study were tests of students' mathematical creative thinking abilities and the Group Embeded Figure Test (GEFT) test. The students 'mathematical creative thinking ability test uses two description questions that are adjusted to the indicators of the students' mathematical creative thinking abilities studied. The GEFT test is a test used to group students according to their cognitive style, whether the student has an indepedent (FI) or dependent field (FD) cognitive style. Student cognitive style is determined based on the Group Embeded Figure Test (GEFT). Subjects who were able to put 12 or more simple images were described as independent field cognitive styles. Subjects who were unable to put more than 11 pictures were described FD cognitive style. Individual scores above the GEFT national average score of 11.4 were classified as FI cognitive style. Based on the results of the GEFT test, for high-level schools, there are 6 students having FI cognitive style and 6 students having FD cognitive style in the experimental class and 7 FI students and 3 FD students in the control class. Medium level schools, 11 FI students and 11 FD students in the experimental class and 9 FI students and 12 FD students in the control class, while in low level schools there are 6 FI students and 8 FD students for the experimental class and 6 FI students and 5 FD students in the control class.

Data analysis in this study was assisted by SPSS 18 software. Data analysis used was t test, U test (Mann-Whitney) and Two Way Anova test to determine the interaction of each research variable with the prerequisite test in the form of normality test and homogeneity test.

4. RESULT AND DISCUSSION

There are 3 indicators of mathematical creative thinking ability of students studied, which are assessed through two test items of students' mathematical creative thinking ability in the form of description. The following statistics describe the test results of students' mathematical creative thinking abilities.

TABLE 3
DESCRIPTIVE STATISTICS ON STUDENTS' MATHEMATICAL CREATIVE THINKING ABILITIES TEST RESULTS

Group	N	Max Value	Min Value	$\bar{x}$	Std. Deviation
Experiment	48	22	9	17.73	3.17
Control	42	20	0	13.29	5.87

Based on Table 2, the average results of the mathematical creative thinking ability test scores of the experimental class students were higher than the control class. The standard deviation of the experimental class is also lower which means that the grades of the experimental class students are more uniform than those of the control class students. In this study also obtained results that the average value of the highest mathematical creative thinking ability of students was obtained by the experimental group with FI cognitive style. The worst results were obtained by control group students with FD cognitive style. Before testing the hypothesis, a prerequisite test is in the form of a normality test and a homogeneity test. Following are the results of the normality test for the two data groups.

TABLE 4
NORMALITY TEST FOR THE EXPERIMENTAL CLASS AND THE CONTROL CLASS

	Mathematical Creative Thinking Ability of Students				
	FI	FD	LS T	LS S	LS R
Experiment	0.002	.200	.200	.001	.157
Control	0.003	.200	.200	.200	.200

Based on Table 4, there are three data that are normally distributed because sig> 0.05 and the rest are not normally distributed. Furthermore, the normal distribution data is tested for homogeneity and the data that is not normally distributed is tested by the U (Mann-Whitney) test. Following are homogeneity test results for normally distributed data groups.

TABLE 5
HOMOGENEITY TEST FOR THE EXPERIMENTAL CLASS AND THE CONTROL CLASS

Classification	Mathematical Creative Thinking Ability of Students	
	Signification Value	Conclusion
FD	.001	Inhomogeneous
LS T	.777	Homogeneous
LS R	0.004	Inhomogeneous

Based on Table 5, the data groups for FD students and low school level are not homogeneous, so the t test is done with the help of SPSS 18 by looking at the significance value for equal variances not assumed. As for the school level data group while the data is homogeneous, then proceed with the t test also using SPSS 18 assistance. However, the significant value taken is the value for equal variances assumed.

Following are the results of the hypothesis test for all groups of data:

TABLE 6
RESEARCH HYPOTHESIS TEST RESULTS

	Students Creative Mateamtis Thinking Ability				
Sig	FI	FD	LS T	LS S	LS R
	0.0035	0,0005	0.086	.001	0.0125
Decision	Reject H_0	Reject H_0	Thank H_0	Reject H_0	Reject H_0

Table 6 shows that the significance value in the FI group is 0.0035 <0.05 and for the FD group is 0.0005 <0.05, so it can be concluded that there are differences in the value of mathematical creative thinking ability of students with FI cognitive style and learning FD using PBL models and conventional learning models. This is supported by the average value of students' mathematical creative thinking abilities with cognitive style FI and FD who learn to use PBL models higher than those who learn conventionally.

Mathematical creative thinking skills that learn to use PBL

models are higher than conventional learning in the FI and FD cognitive styles caused by PBL processes which are very compatible with the attitudes of students who have the FI cognitive style, because in carrying out assignments or solving a problem, FI students trying to tinker with a variety of ideas to find solutions to existing problems with their own language and expression and students with FD cognitive styles tend to be socially oriented and prioritize external motivation and reinforcement, and the PBL model in addition to emphasizing group work, especially in completing assignments can gave rise to high social interactions [7].

The table above, also shows that the significance value at the high school level is 0.086> 0.05, it can be concluded that there is no difference between the value of mathematical creative thinking ability of students learning with PBL models and conventional learning models at the high school level. Meanwhile, for the moderate school level 0.001 <0.05 and for the low school level 0.0125 <0.05, it can be concluded that there are differences in the value of mathematical creative thinking abilities of students who learn to use the PBL model and conventional learning models at medium and low school levels .

Based on the results of descriptive statistics, there are significant differences in the average value of students' mathematical creative thinking abilities between the experimental class and the control class at the high, medium and low school levels. However, based on the results of hypothesis testing, the average value of students' mathematical creative thinking abilities between the experimental class and the control class did not differ significantly. This is in line with the results of research which states that the ability of students in high-level schools that tend to be homogeneous and upward, is felt to be a factor in the slow progress of group activities, students tend to be competitive, and less interested in sharing roles and tasks and knowledge which results in increased knowledge only occurs in students who are active, because they want to involve themselves in activities to find knowledge [19].

The following two-way ANOVA test results to see the interaction between PBL learning models and cognitive styles in influencing students' mathematical creative thinking abilities:

TABLE 7
ANOVA TWO-WAY TEST RESULTS FOR THE EXPERIMENTAL CLASS AND THE CONTROL CLASS

Tests of Between-Subjects Effects

Dependent Variable: CREATIVE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	591.901a	3	197,300	9,858	.000
Intercept	21694,740	1	21694,740	1083,967	.000
MODEL	428,808	1	428,808	21,425	.000
COGNITIVE STYLE	171,829	1	171,829	8,585	.004
MODEL * COGNITIVE STYLE	22,367	1	22,367	1,118	293
Error	1721,221	86	20,014		
Total	24623,000	90			
Corrected Total	2313.122	89			

a. R Squared = .256 (Adjusted R Squared = .230)

Based on the table, the significance value of 0.293> 0.05 thus it can be concluded that H_0 is accepted. H_0 acceptance means that there is no interaction between the learning model and cognitive style in influencing students' mathematical creative thinking abilities. This situation is also seen from the following picture.

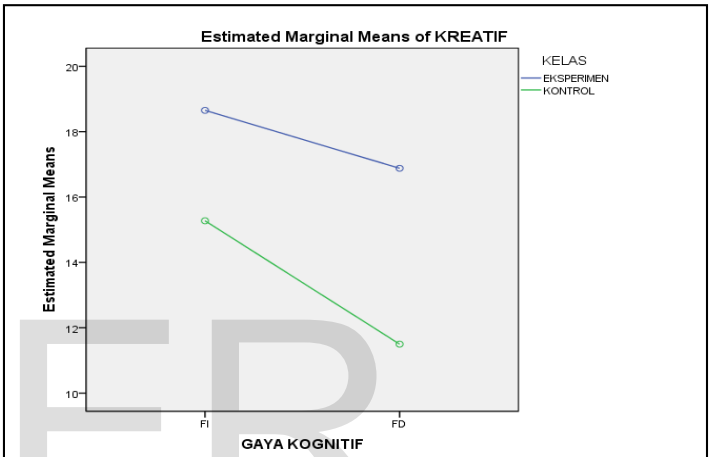


Figure 2. Students' Creative Mathematical Thinking Abilities Judging from the Learning Model and Cognitive Style

Based on the picture above, because there is no line intersection it can be concluded that there is no interaction between the problem-based learning model and cognitive style in influencing students' mathematical creative thinking abilities. However, based on data analysis using PBL models is higher than conventional learning models on the cognitive style of FI and FD. This is in line with the results of research that the PBL model can improve learning outcomes in mathematics so that it can encourage students to learn creatively and independently for students who are in the cognitive style of FI and FD [7].

Furthermore, to see the interaction between learning models and school level in influencing mathematical creative thinking abilities can be seen from the following table:

TABLE 8
ANOVA TWO-WAY TEST RESULTS FOR THE EXPERIMENTAL CLASS AND THE CONTROL CLASS

Tests of Between-Subjects Effects

Dependent Variable: CREATIVE

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	556,930a	5	111,386	5,294	.000
Intercept	20037.109	1	20037.109	952,317	.000

MODEL	365,852	1	365,852	17,388	.000
LEVEL_School	71,721	2	35,860	1,704	.188
MODEL * LEVEL_SOL	53,759	2	26,879	1,278	.284
Error	1767,392	84	21,040		
Total	24383,000	90			
Corrected Total	2324,322	89			

a. R Squared = .240 (Adjusted R Squared = .194)

Table 7 shows that the significance value of the interaction of learning models and school level is 0.284> 0.05, it can be concluded that H0 is accepted which results in no interaction between learning models and school level in influencing students' mathematical creative thinking abilities. This is supported by the following image:

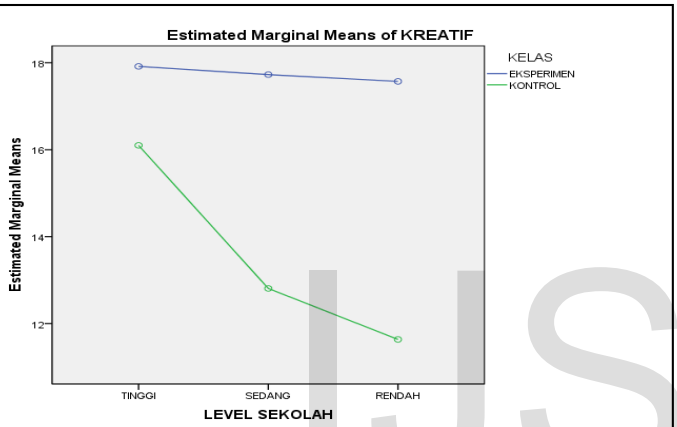


Figure 3. Students' Creative Mathematical Thinking Abilities Judging from the Learning Model and School Level

The picture above shows that there are no intersecting lines on the interaction graph so it can be concluded that there is no interaction between the learning model and the school level in influencing students' mathematical creative thinking abilities. This contradicts the results of Tatang's research [12] and is in line with research [11] [19]. One of the factors causing the lack of interaction between learning models and school level in influencing students 'mathematical creative thinking abilities is the increase in students' mathematical creative thinking abilities in the experimental class is not as good as in the control class. This can be seen from the average value of students' mathematical creative thinking abilities in the experimental class not significantly different from the control class.

5. CONCLUSION

Mathematical creative thinking abilities of students with FI and FD cognitive styles who learn to use problem-based learning are higher than those who learn using conventional learning. In addition, the mathematical creative thinking ability of students who learn to use problem-based learning is higher than those who learn to use conventional learning at medium and low levels but at high levels do not have significant differences. There is no interaction between learning models and cognitive styles in influencing students' mathematical creative thinking abilities and school level.

ACKNOWLEDGMENT

We would like to thank the Padang State University Research and Services Center, MTsN 16 Tanah Datar, MTsN 1 Tanah Datar, MTsN 7 Tanah Datar and all parties involved in this research.

REFERENCES

[1] Y. Ariyana, A. Pudjiastuti, R. Bestary, Buku Pegangan Pembelajaran Beorientasi pada Keterampilan Berpikir Tingkat Tinggi. Direktorat Jenderal Guru dan Tenaga Kependidikan Kementerian Pendidikan dan Kebudayaan, 2018.

[2] S. H. Noer, "Kemampuan Berpikir Kreatif Matematis dan Pembelajaran Matematika Berbasis Masalah Open-Ended," J. Pendidikan Matematika, volume 5, nomor 1, Januari 2011

[3] Amidi, Z. Zahid, "Membangun Kemampuan Berpikir Kreatif Matematis dengan Model: Pembelajaran Berbasis Masalah Berbantuan E-Learnung," J. Seminar Nasional Matematika X Universitas Negeri Semarang, 2016.

[4] Solehuzain, N. K. Dwidayati, "Kemampuan Berpikir Kreatif dan rasa Ingin Tahu pada Model Problem Based Learning dengan Masalah Open Ended," Unnes of Journal of Mathematics Education Research 6(1), p-ISSN: 2252-6455, e-ISSN: 2502-4507, 2017.

[5] H. Sugilar, "Meningkatkan Kemampuan Berpikir Kreatif dan Disposisi Matematik Siswa Madrasah Tsanawiyah Melalui Pembelajaran Generatif," J. Ilmiah Program Studi Matematika STKIP Siliwangi Bandung, volume 2, nomor 2, Sepetember 2013.

[6] R. Mahumuzah, "Peningkatan Kemampuan Berpikir Kritis Matematis Siswa SMP Melalui Pendekatan Problem Posing,"J. Peluang, volume 4, nomor 1, ISSN: 2302-5158, 2015.

[7] F. R. S. Kalaka, "Pengaruh Model Problem Based Learning terhadap Hasil Belajar Matematika Ditinjau dari Gaya Kognitif Peserta Didik," J. Riset dan Pengembangan Ilmu Pengetahuan, volume 02, nomor 1, Februari 2017.

[8] H. B. Uno, Orientasi Baru dalam Psikologi Pembelajaran. Jakarta: PT. Bumi Aksara, 2006.

[9] B. U. Onyekuru, "Field Dependence-Field Independence Cognitive Style, Gender, Career Choice and Academic Achievement of Secondary School Students in Emohua Local Goverment Area of Rivers State," Journal of Education and Pratice, 6(10), 2015.

[10] I. K. Reta, "Pengaruh Model Pembelajaran Berbasis Masalah terhadap Keterampilam Berpikir Kritis Ditinjau dari Gaya Kognitif Siswa," Artikel Program Studi Pendidikan IPA Program Pascasarjana Universitas Pendidikan Ganesha, Juli 2012.

[11] D. Ismaimuza, "Pengaruh Pembelajaran Berbasis Masalah dengan Strategi Konflik Kognitif terhadap Kemampuan Berpikir Kritis Matematis dan Sikap Siswa SMP," J. Pendidikan Matematika, volume 4, nomor 1, Juni 2010.

[12] T. Mulyana, "Pembelajaran Analitik Sintetik untuk Meningkatkan Kemampuan Berpikir Kritis dan Kreatif Matematiks Siswa SMA," J. Educationist, volume III, nomor 1, ISSN: 1907-8838, Januari 2009.

[13] Rusman, Belajar dan Pembelajaran Berorientasi Standar Proses Pendidikan. Jakarta: Pramedia Group.

[14] D. B. Widjajanti, "Memnumbuhkan Kecerian dan Antusianisme Siswa dalam Belajar Matematika Melalui Pembelajaran Berbasis

Masalah," Prosiding Seminar Nasional Matematika Sekolah, Jurusan Pendidikan Matematika, FMIPA,UNY, 6 Desember 2009.
[15] Rusman, Model-model Pembelajaran: Mengembangkan Profesionalisme Guru. Jakarta: PT. RajaGrafindo Persada, 2012.
[16] A. Elizabeth, M. M. Sigahotong, "Pengaruh Model Problem Based Learning terhadap Kemampuan Berpikir Kreatif Peserta Didik SMA," Prisma Sains: J. Pengakajian Ilmu dan Pembelajaran Matematika dan IPA IKIP Mataram, http://ojs.ikipmataram.ac.id/index.php/prismasains/index, 2018.
[17] T. Y. E. Siswono, "Proses Berpikir Kreatif Siswa dalam Memecahkan dan Mengajukan Masalah Matematika," J. Ilmu Pendidikan, jilid 15, nomor 1, Februari 2008.
[18] S. Arikunto, Prosedur Penelitian Suatu Pendekatan Praktek. Jakarta: Rineka Cipta, 2012.
[19] H. Nufus, "Pengaruh Interaksi Pembelajaran dan Level Sekolah terhadap Kemampuan Komunikasi Matematis Siswa," J. Penelitian Pendidikan Matematika, volume 10, nomor 1, 2017.