Journal of Education and Practice
ISSN 2222-1735 (Paper) ISSN 2222-288X (Online)
Vol.9, No.9, 2018

Differences in Mathematical Connection and Conceptual Understanding Ability Between Students Taught by Using Problem-Based Learning and Direct Learning Model in SMP Negeri 1 Bilah Barat

Densa Ritonga Bornok Sinaga Pargaulan Siagian
Department of Mathematics, Science Faculty, State University of Medan, Jl. Willem Iskandar Pasar V Medan Estate, Kode Pos 20221, Indonesia

Abstract
This study aims to determine: (1) whether the mathematical connection ability of students in the application of problem-based learning is higher than direct learning, (2) whether the conceptual understanding ability of students in the application of problem-based learning is higher than direct learning, (3) active activities of students during the implementation of problem-based learning, (4) the level of ability of teachers to manage classes in the application of problem-based learning. This research is a quasi-experimental research. The population of this study is all students of class VIII SMP Negeri 1 Bilah Barat which consists of 4 parallel classes, while the sample in this study taken two classes of population. Inferential analysis of data is done by ANACOVA test. The results of this study indicate that: 1) students' mathematical connection ability in the application of problem-based learning is higher than direct learning. 2) students' conceptual understanding ability in the application of problem-based learning is higher than direct learning. 3) the level of student's active activity during the application of problem-based learning meets ideal time tolerance, 4) the ability of the teacher to manage learning during problem-based learning gets into the criteria good enough.
Keywords: Differences, Mathematical Connection Ability, Conceptual Understanding Ability, Problem-Based Learning, Direct Learning.

1. Introduction

Formal education has a very close relationship with mathematics, because at every level of formal education in the field of mathematics is always studied by students. Mathematics has a very important role in life because basically math is required by all scientific disciplines to improve the prediction and control of the science. Mathematics also plays an important role in the development of modern technology, various disciplines and advances the human mind. Given the importance of mathematics in life, it should be taught at every level of mathematics education. Cornelius (Abdurrahman, 2012) suggests five reasons for studying math because math is (1) a means to think clearly and logically, (2) the means to solve the problems of everyday life, generalizations experience, (4) the means to develop creativity, and (5) a means to increase the awareness of cultural development.

The importance of mathematics is also evident from the statement of Cockroft (Abdurrahman, 2012) that "mathematics needs to be taught to students because it is always used in all aspects of life". One of the goals of learning mathematics in the 21st century is that students are able to have high-level thinking skills. In study of mathematics, the ability to think and to solve the problem is one of the most important abilities that must be owned by the students (Mustafa et al., 2017). A very important thinking ability possessed by a student is the ability of students mathematical connection and conceptual understanding ability.

The importance of mathematical connection capability for students as NCTM (2000) states "the ability of mathematical connections is important because mathematical thinking involves finding connections and making connections builds understanding of math". Without connections students must learn and remember many concepts and which are isolated abilities. With connections students can build a new understanding on prior knowledge. Furthermore, Suherman (2001) suggests that "there is no concept or operation in mathematics that is not connected with other concepts or operations in a system, because of the fact that the essence of mathematics is something always related to something else". Without the ability to connect mathematics, one cannot solve mathematical problems with mathematics itself, mathematics with other fields of science, and mathematics with the real world. On the other hand, the importance of conceptual understanding for students as Uno (2012) suggests that conceptual understanding is the competence shown by students in understanding the concept and in performing the procedure (algorithm) flexibly, accurately, efficiently, and appropriately. Understanding the concept also becomes one of the aspects of assessment by teachers to students.

Given the importance of students mathematical connection and conceptual understanding ability, it is fitting for every student to have mathematical connection ability and a good understanding of concepts. However, based on preliminary observations in SMP Negeri 1 Bilah Barat, the facts show that students' mathematical connection ability is still low. The low ability is seen from the results of diagnostic tests that show the problems that occur in students is that students are still not able to communicate the purpose of the given problem. This is because during this time students are only accustomed to just counting without expressing ideas / ideas in oral and written form. In addition, students are always fixed with numbers, so when a mathematical problem is presented in the form of problems in the form of symbols or in-depth analysis then the students are unable to solve it. On the other hand, students' conceptual understanding ability is still low. The diagnostic test results indicate that the student has not been able to understand the problem so that the student is not correct in determining whether the given problem is an example or not an SPLDV example. In fact, to solve non-routine problems that require conceptual understanding, students must be able to go through the defined stages.

One of the causes of low students Mathematical connection and conceptual understanding Ability' is influenced by the learning model used by teachers. During this time teachers use conventional learning methods in the classroom. The facts on the ground show a fairly apprehensive phenomenon, namely: 1) learning during this time students cannot make a connection between what they learn in school and how the knowledge will be applied. 2) students face difficulty understanding academic concepts (such as mathematical concepts) when they are taught with traditional learning, whereas they are very necessary to understand concepts as they relate to the real world. 3) students are expected to make their own relationships outside of class activities. Responding to problems that arise in the learning of mathematics, the need for the use of learning models that can make students active in learning activities, making learning meaningful, and able to train students to accustomed to mathematical and communicate mathematically in learning activities.

Problem Based Learning Model (PBL) is one solution, because according to Arends (2008), problem based learning model is a model of learning by learning approach the students on the issue of authentic and meaningful to students who serve as the foundation for investment and research students, so students can construct their own knowledge, to develop higher skills and inquiry, independent students, and increase the confidence of students. In addition, direct learning can also be used as one solution. As Trianto (2007) suggests that one to improve the quality of mathematics education is by direct learning model.

After establishing the topic of material discussion and learning objectives as well as the types of student learning activities required with the preparation of teachers, the learning will go well. With the application of problem-based learning model and direct learning students are expected to be more active in learning, and can help students in improving students mathematical connection and conceptual understanding ability.

2. Literatures

2.1. Mathematical Connection Ability

Suherman (2001) argues that "there is no concept or operation in mathematics that is not connected with other concepts or operations in a system, because of the fact that the essence of mathematics is something always related to something else". To be able to connect first must understand the problem and to be able to understand the problem must be able to make connections with related topics.

Sumarmo (2006) states that there are three objectives of mathematical connections in learning, namely: (1) broadening the knowledge of students' knowledge, (2) viewing mathematics as a coherent whole, and (3) expressing relevance and benefits both in school and outside school. The purpose of mathematical connections is that students can view mathematics as a unified whole, investigate problems and describe the results of the use of mathematical material or present it, understand mathematical ideas to understand later mathematical ideas, use mathematical thinking and models in solving problems in other disciplines beyond mathematics.

Mathematical connections are divided into three groups: 1) aspects of connection between mathematics topics, 2) aspects of connection with other disciplines, and 3) aspects of connection with real world siswal (connection with daily life). Through mathematical connections it is expected that students' insights and thoughts will be more open, not just focused on the topic being studied, so as to foster a positive attitude towards math lessons.

2.2. Conceptual Understanding Ability

Rosyada (2004) argues that "understanding is the ability to understand what is being communicated and able to implement ideas without having to relate them to other ideas, and also without having to look at them in depth". A person is said to understand something when he can organize and recapture what he learns by using his own sentence. Students no longer remember and memorize the information they get, but must be able to choose and organize the information.

Sanjaya (2008) asserts that "understanding is not merely a matter of fact, but concerning the ability to explain, explain, interpret or capture the meaning or meaning of a concept". Soejadi (2005) defines the concept as "an abstract idea that can be used to classify or classify which is generally expressed by a term or set of words". Concepts are also the basis of thinking and learning about rules in mathematics. The basic foundation of mathematical knowledge is that understanding of concepts and rules in mathematics is a procedure.

Based on the above description, the understanding of the mathematical concepts referred to in this study is the ability of students to translate the sentence in the matter into other forms (eg variables), and then applied to the concept that has been chosen correctly to solve the problem by using the calculation mathematical. Indicators The understanding of mathematical concepts in this study is guided by the use of Bloom, that is: translation, interpretation and extrapolation.

2.3. Problem-based Learning Model

Problem-based learning is a learning model that uses problems as the starting point of learning. The problems that can be used as a means of learning are problems that meet the real-world context, which is familiar with the daily life of the students. Eggen and Kauchak (2012) mentions problem-based learning is a set of teaching models that use problems as a focus for developing problem-solving skills.

Arends (2008) suggests that the problem-based learning model is a learning model in which students work on authentic issues with the intent to structure their own knowledge, develop inquiry and higher-order thinking, develop self-reliance and self-confidence. Tan (Rusman, 2012) adds that problem-based learning is the use of the various intelligences needed to confront real-world challenges, the ability to deal with everything new and complexity. The problem-based learning indicator in this study refers to Arends (2012) stating five stages in problem-based learning are: 1) student orientation on the problem, 2) organizing students to learn, 3) assisting individual and group investigations, 4) developing and presenting results works, and 5) analysis and evaluation of problem solving.

2.4. Direct Learning Model

Kardi (2002) suggests that "direct learning is a learning model of the Teacher Center approach. In applying the direct learning model, the teacher should demonstrate the knowledge and skills to be trained to the students gradually (step by step)". In line with that, Trianto (2007) argued that "the direct learning model is one of the teaching approaches specially designed to support the student learning process related to declarative knowledge and well structured procedural knowledge that can be taught with gradual, step-by-step pattern of activities".

Based on some opinions above, it can be argued that the direct learning model is a model of learning with the planning and implementation of a detailed enough, especially on the analysis task. Direct learning is teacher-centered, but it must ensure student involvement. So the environment must be created that is oriented to the tasks assigned to the students. Trianto (2007) suggests steps to implement direct learning include: a) conveying goals and preparing students, b) conveying goals, c) preparing students, d) percentages and demonstrations e) achieving clarity, f) achieving understanding and mastery, g) practice and h) provide guided training.

3. Research Methods

This type of research is quasi experimental research. This study aims to examine differences in the ability of mathematical connection and conceptual understanding of junior high school students who acquired problem-based learning and direct learning. The population of this research is all students of class VIII SMP Negeri 1 Bilah Barat. While the samples in this study were chosen randomly so that the experiment-I and experiment-II classes are VIII-2 and VIII-3, each of which consists of 30 students.

The data collection procedure in this research is to prepare the test device of students mathematical connection and conceptual understanding ability. Another factor that became the focus of this research is the early ability of mathematics students. In this research, the test is divided into the pretest test to know the students' early ability, and the final test (posttest) to know students mathematical connection and conceptual understanding ability after the learning activity. The research design in this research is can be seen in Table 1 below:

Table 1. Research Design

Treatment Group	Pretest	Treatment	Posttest
PBL (experiment-1)	T_1	X_1	T_2
DL (experiment-2)	T_1	X_2	T_2

Explanation:

T_1 : Pretest
T_2 : Posttest
X_1: Treatment of Problem-Based Learning model (PBL)
X_2: Treatment of Direct Learning model (DL)

In the data analysis stage, the data of students' mathematical connection and conceptual understanding ability are analyzed quantitatively by using ANACOVA test with the application of Syahputra (2016) statistical model and SPSS 20 program. To measure the student's active activity, based on the ideal time tolerance criteria of activity proposed by Mustafa, et al (2017). While the data ability of teachers in managing learning by applying the model of PBL analyzed by looking for the average value of the category of some aspects of assessment provided by observers for the four implementation plan of learning.

4. Result

The results of the study were reviewed based on the pretest and posttest results of mathematical connection ability and ability to comprehend the concept given. The pretest result is given to see students' initial ability. While posttest results are used to see the results of experimental hypothesis testing. However, before the hypothesis test is done using ANACOVA, prerequisite test is firstly done consisting of normality test, homogeneity and linearity on data acquisition of mathematical connection ability and concept comprehension.

The result of data prerequisite test consisting of normality test, homogeneity, and linearity indicate that pretest and posttest score of mathematical connection ability and concept comprehension is eligible for ANACOVA analysis test. ANACOVA test results using SPSS 20 program for students' mathematical connection ability can be seen in Table 2 below:

Table 2. Summary of ANACOVA Results for Mathematical Connection Ability

Tests of Between-Subjects Effects

Dependent Variable:Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	5350.017[a]	2	2675.009	621.379	.000
Intercept	100.995	1	100.995	23.460	.015
Pretest	4821.951	1	4821.951	11,208	.028
Model	272.876	1	272.876	63.386	.002
Error	245.383	57	4.305		
Total	267748.000	60			
Corrected Total	5595.400	59			

a. R Squared = ,956 (Adjusted R Squared = ,955)

Based on ANACOVA test results seen that the source of influence of learning model on students' mathematical connection ability obtained F = 63,386 with significance value 0,002 < 0,05. It shows that at the 95% confidence level, there are differences in students' mathematical connection ability between those learning with problem-based learning model and direct learning.

The regression model that has been obtained for mathematical connection ability of experimental class is $Y_E = 10{,}37 + 0{,}993X_E$ and regression equation for control class $Y_K = 6{,}419 + 0{,}988X_K$, geometrically regression line for the experimental class is above the control class regression line. The regression line height describes the result of students' mathematical connection ability, that is when X = 0, the regression equation for the mathematical connection ability of the experimental class is Y = 10,37 and the control class regression equation Y = 6,419. It can be concluded that students' mathematical connection ability in the application of problem-based learning model is higher than direct learning.

Furthermore, ANACOVA test result using SPSS 20 program for students' conceptual understanding ability can be seen in Table 3 below:

Table 3. Summary of ANACOVA Results for Conceptual Understanding Ability

Tests of Between-Subjects Effects

Dependent Variable:Posttest

Source	Type III Sum of Squares	df	Mean Square	F	Sig.
Corrected Model	7071.562[a]	2	3535.781	629.474	.000
Intercept	36.087	1	36.087	6.425	.014
Pretest	6293.962	1	6293.962	12,239	.006
Model	1207.149	1	1207.149	24.908	.000
Error	320.171	57	5.617		
Total	269280.000	60			
Corrected Total	7391.733	59			

a. R Squared = ,956 (Adjusted R Squared = ,955)

Based on ANACOVA test results seen that the source of influence of learning model on students' mathematical connection ability obtained F = 24,908 with significance value 0,000 < 0,05. It shows that at the 95% confidence level, there is a difference in the ability to understand students' concepts between those learning with problem-based learning model and direct learning. The regression model that has been obtained for mathematical connection ability of experimental class is $Y_E = 5{,}219 + 1{,}207X_E$ and regression equation for control class $Y_K = 2{,}318 + 0{,}996X_K$, geometrically regression line for the experimental class is above the control class regression line. It can be concluded that the students' conceptual understanding ability in the application of problem-based learning model is higher than direct learning.

Furthermore, the percentage and average of students' active activity in learning-based for each category of student activity, summarized in the following Table:

Table 4. Average Percentage of Ideal Time Student Activity in Experiment Class

Meeting	Average Time of Student Activity for Each Category (in percent)				
	1	2	3	4	5
I (2 x 40')	25,67	15,67	27,00	27,67	4,00
II (2 x 40')	23,50	19,00	25,25	27,25	5,00
III (2 x 40')	26,97	14,58	28,21	25,19	5,10
IV (2 x 40')	24,30	17,07	26,30	27,40	5,00
Average	**25,11**	**16,58**	**26,69**	**26,88**	**4,78**
Interval Tolerance	20 % ≤ PWI ≤ 30 %	10 % ≤ PWI ≤ 20 %	25 % ≤ PWI ≤ 35 %	25 % ≤ PWI ≤ 35 %	0 % ≤ PWI ≤ 5 %
Criteria	Fulfilled	Fulfilled	Fulfilled	Fulfilled	Fulfilled

The conclusions can be taken according to the criteria specified in the study where three of the five aspects of the category are met and the third (3), fourth (4) aspects must be met, so that the observation of the student's active activity meets the specified tolerance limits. Thus, when viewed from the aspect of the student's active activity of all categories of observations in the implementation of problem-based learning lies within the specified ideal time tolerance limits.

Furthermore, the observed data of the teacher's ability to manage the learning during the learning activity is analyzed by using the average score of the teacher's ability to manage the learning as much as 4 meetings. The summary of the teacher's ability to manage the learning can be seen in the following Table:

Table 5. Master's Ability to Manage Learning

Num.	**Observed Aspects of Managing Learning**	NK_i	NK
1	Preliminary activities	3,83	3,50
2	Core activities – Observing – Questioning – Gathering information – Processing information – Connecting mathematics	3,33	
3	Closing activity	3,33	
4	The ability to manage time	3,50	

By looking at the overall average value and above description, it can be said that the ability of teachers to manage learning in the category of "good enough".

5. Discussion

The ability of mathematical connection is an ability that can include and contain various opportunities to communicate in learning activities (Sudrajat, 2001). The results showed that there are differences in students' Mathematical connection Ability taught through problem-based learning models with students taught through direct learning models. Many factors that cause Mathematical connection Ability of students who receive problem-based learning is better than students who received direct learning. One of the factors is the stages of problem-based learning that gives greater influence in training and developing students' mathematical connection ability that is at the stage of assisting independent and group investigations (Arends, 2008). At this stage students try to get the right information, carry out experiments, seek explanations and solutions of the problems given.

Susanto (2015) argues that students are said to have the ability to understand mathematical concepts if he can formulate a solution strategy, apply simple calculations, use symbols to present the concepts, and transform a form into another form such as fractions in mathematics learning. Walle (2008) says that there are a number of factors that can influence students 'understanding of mathematical concepts: (1) students' reflective thinking, (2) interaction, and (3) use of models and tools for learning. The learning model used by the teacher can influence the students' comprehension ability.

In addition to appropriate in membelajar Mathematical connection Ability, problem-based learning is also appropriate to train students' conceptual understanding ability, because problem-based learning makes learning atmosphere more meaningful. As Ausubel (Rusman, 2012) states "meaningful learning is a learning process in which new information is linked to the structure of understanding that a learned person already has." It involves understanding the concepts that students have previously had. In problem-based learning, When students have difficulty in learning activities, students can ask the teacher as a facilitator or friend who is more understanding. This is in line with Piaget's theory of cognitive development (Trianto, 2009) believes that physical experiences and environmental manipulation are important for developmental change.

The results showed that students mathematical connection and conceptual understanding taught by problem-based learning is better than direct learning. The results of this study are also reinforced by research conducted Syahputra & Surya (2016) also shows that problem-based learning model can be implemented to improve the ability of high-level thinking in solving math problems. Syahputra (2013) also reveals problem-based learning to improve the ability to solve mathematical problems, devergen thinking, and improve students' mathematical creativity. Similarly, Lubis (2014) concluded that the problem solving of students' math problems given problem-based learning is more similar than that of the expository model. On the other hand, Nasution (2013) suggests that problem-based learning can improve students' problem solving and Mathematical connection Ability. Similarly, some research findings indicate that the application of problem-based learning can improve the thinking ability of high-level students (Syahputra & Surya, 2015; Aufa, 2016; Surya & Syahputra, 2017).

Through the application of problem-based learning is also able to make students more active in learning activities. The results are in line with Etiubon's (2016) assertion that the use of problem-based learning involves students active in critical thinking, facilitating problem-solving skills and helping them to perform better. Along with that, Abanikannda (2016) states that by using problem-based learning helps students get the skills they need to use in their daily lives such as cooperation, analysis, and connection will increase.

In addition to the role of learning models, the ability of teachers to manage learning is also important in helping students improve mathematical connection and conceptual understanding ability. As Mulyasa (2005) suggests that the role of teachers who have an effect on improving learning achievement of learners. In line with that, Mart (2013) suggests that there is a strong correlation between the teaching ability of the teacher and the success of student learning. Commitment, sense of obedience, and other abilities are key factors that influence student learning.

From some opinions, the results of research and findings in this study can be expressed the advantages of implementation of problem-based learning is to give a positive impact for improving the process of learning by teachers in the classroom. The use of this lesson leads more to the creativity of students and teachers more to facilitate directing students during the implementation of learning, especially in problem solving. It proved able to improve students' high-order thinking ability, especially in this research the ability of mathematical connection and conceptual understanding ability of student.

6. Conclussion

Based on the results of analysis and discussion in this study, presented several conclusions as follows:

1) Students' mathematical connection ability in the application of problem-based learning is higher than direct learning.
2) Students' conceptual understanding ability in the application of problem-based learning is higher than direct learning.
3) The level of student's active activity during the application of problem-based learning meets ideal time tolerance.
4) The ability of teachers to manage learning during problem-based learning goes into the criteria good enough.

References

Abanikannda. (2016). Influence Of Problem-Based Learning In Chemistry On Academic Achievement Of High School Students In Osun State, Nigeria. *International Journal of Education, Learning and Development*, 4(3):55-63.

Abdurrahman, M. (2012). *Education of Children that Difficult to Study*. Jakarta: Rineka Cipta

Arends, R.I. (2008). *Learning to Teach, Belajar untuk Mengajar. Edisi Ketujuh. Jidil Dua*. Terjemahkan oleh Soedjipto, Helly, P. dan Soedjipto, Sri, M. Yogyakarta: Pustaka Pelajar.

Arends, R.I. (2012). *Learning to Teach, 9th Edition*. New York: McGraw-Hill, a business unit of The McGraw-Hill Companies, Inc.

Aufa, M., Saragih, S., Minarni, A. (2016). Development of Learning Devices through Problem Based Learning Model Based on the Context of Aceh Cultural to Improve Mathematical Communication Skills and Social Skills of SMPN 1 Muara Batu Students. *Journal of Education and Practice*. 7(4): 232-248.

Eggen, P. & Kauchak, D. (2012). *Strategi dan Model Pembelajaran Mengajarkan Konten dan Keterampilan*

Berpikir. Jakarta: Indeks.

Etiubon, R. U. (2016). Problem-Based Learning and Students' Academic Achievement on Thermodynamics (A case study of University of Uyo, Akwa - Ibom state, Nigeria). *IOSR Journal of Research & Method in Education*, 6(5).

Kardi. (2002). *Guru Powerful, Guru Masa Depan*. Penerbit Kolbu, Bandung.

Lubis, N. (2014). Perbedaan kemampuan pemecahan masalah dan metakognisi matematika antara siswa yang diberi Pembelajaran Berbasis Masalah dengan Pembelajaran Ekspositori. *Jurnal PARADIKMA,* 7(3).

Mart, C. T. (2013). A Passionate Teacher: Teacher Commitment and Dedication to Student Learning. *International Journal of Academic Research in Progressive Education and Development*, 2(1)

Mulyasa. E. (2005). *Menjadi Guru Profesional.* Bandung: Remaja Rosda Karya.

Mustafa., Sinaga, B., & Asmin. (2017). Development of Learning Devices Through Problem Based Learning Model to Improve Students Metacognition Skill at SMPN 17 Medan. *Journal of Education and Practice*. 8(24), 34-41.

Nasution, H. A. (2013). Perbedaan Peningkatan Kemampuan Pemecahan Masalah dan Komunikasi Matematik Siswa pada Pembelajaran Berbasis Masalah dan Pembelajaran Langsung pada Siswa Sekolah Menengah Pertama. *Jurnal PARADIKMA*.

National Council of Teacher of Mathematics. (2000). *Principle and Standart of school Mathematics, Reston*: NCTM.

Rosyada, D. (2004). *Paradigma Pendidikan Demokratis*. Jakarta: Kencana.

Rusman. (2012). *Model-model Pembelajaran Mengembangkan Profesionalisme guru*. Jakarta: Rajawali Pers.

Sanjaya, W. (2008). *Strategi Pembelajaran; Berorientasi Standar Proses Pendidikan*. Jakarta: Kencana Prenada Media Group.

Soejadi. R. (2005). *Kiat Pendidikan Matamatika Di Indonesia,* Direktorat Jendral Pendidikan Tinggi Departemen Pendidikan Nasional, Jakarta.

Sudrajat. (2001). *Dasar-dasar Penelitian Ilmiah.* Bandung: Pustaka Setia

Suherman, et al. (2001). *Common Tex Book Strategi Pembelajaran Matematika Kontemporer.* Bandung: Jurusan Pendidikan Matematika UPI Bandung.

Sumarno. U. (2006). *Evaluasi Program Pendidikan Sekolah Menengah Kejuruan Teknologi dan Industri (SMKTI) Kota Bandar Lampung Untuk Perencanaan Strategis Level Mikro*. *Disertasi*. Yogyakarta: PPs Universitas Negeri Yogyakarta.

Surya, E & Syahputra, E. (2017). Improving High-Level Thinking Skills by Development of Learning PBL Approach on the Learning Mathematics for Senior High School Students. *Canadian Center of Science and Education*, 10(8), 12-20.

Susanto, A. (2015). *Teori Belajar dan Pembelajaran di Sekolah Dasar*. Jakarta: Prenadamedia Group.

Syahputra, E & Surya, E. (2016). The Development of Problem Based Learning Model to Construct High Order Thinking Skill Students' on Mathematical Learning in SMA/MA. *Journal of Education and Practice,* 5(39).

Syahputra, E. & Surya, E. (2015). *Pengembangan Model Pembelajaran Berbasis Pemecahan Masalah untuk Mengkonstruksi Berpikir Tingkat Tinggi dalam Pembelajaran Matematika di SMA/MA.* Pontianak: Universitas Tanjungpura. Prosiding Semirata bidang MIPA BKS-PTN Barat.

Syahputra, E. (2013). *Pembelajaran Berbasis Masalah dan Kreativitas Siswa dalam Pendidikan Matematika*. Medan: UNIMED. Prosiding Seminar Nasional Matematika dan Terapan (SiManTap4, Vol.2)

Syahputra. (2016). *Statistik Terapan.* Medan: UNIMED Press.

Trianto. (2009). *Model Mendesain Model Pembelajaran Innovatif-Progresif.* Jakarta: Prestasi Pustaka.

Trianto. (2007). *Mendesain Model Pembelajaran Innovatif Progresif*. Jakarta: Kencana.

Uno, H. B. (2012). *Perencanaan Pembelajaran*. Jakarta : BumiAksara.

Walle, J. A. (2008). *Pengembangan Pengajaran Sekolah Dasardan Menengah Matematika*. Erlangga, Jakarta.