The Effect of Concept-Rich Instruction on the Ability of Mathematical Study School Students Under reviewed from Math Anxiety

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Abstract : *purpose of this study is to determine the effect of learning approach Concept-Rich Instruction to the ability of mathematical understanding in terms of math anxiety of elementary school students. The study was conducted in SD Negeri 1 Sindang kasih with a sample of third-grade students A and III B 45 people an experimental class and class III C and III D with a sample of 45 students as a control class conducted in the academic year 2017/2018. Research using treatment by level 2 x 2. Data analysis technique is a two-lane variance analysis (ANOVA). The result of the research shows that (1) there is a difference in students' mathematical understanding ability which learn by using concept-rich instruction approach with students using conventional learning approach; (2) there is an interaction between learning approach and math anxiety to the ability of mathematical understanding; (3) students' mathematical comprehension ability with low math anxiety level learning using approaches concept-rich instruction is higher than that of learning using conventional learning approach; (4) the mathematical understanding of students with high levels of math anxiety who learn to use the learning approach concept-rich instruction is lower than those learning using conventional learning approaches.*

Keywords: *learning approach, concept-rich instruction, mathematical understanding ability, math, math anxiety.*

INTRODUCTION

Mathematics is one of the most important disciplines in human life. Freudenthal in Alfiah reveals "*Mathematic is a human activity"* (Alfiah, 2014, pp. 418). Various activities in everyday life require the process of thinking mathematically. In line with that Valsa C Paul Ernest and Roy Casey stated: *What is mathematics? Mathematics includes the learning of facts, skill and concept*, *the building of conceptual structure*, *and the development of the mathematics of the mathematics.* (Sumantri, 2012, p.44)
Learning mathematics contains an important element that must be mastered is the "mathematical concept". The concept of mathematics is an abstract idea that can be used to classify or classify a set of objects. "*Mathematics is a logically organized conceptual system*" (Godino, 1996, p.3). Therefore, the concept of mathematics can be said as the initial foundation in building students' mathematical abilities.
The idea of constructivism holds that learning is an active activity to form a knowledge. Immanuel Kant argues that the mind is an active organ and the teacher is responsible for providing learning experiences to students in building concepts that can determine the success of learning on an ongoing basis (Benhur, 2006, pp. V). Learning activities are described as an active process undertaken by students in organizing, constructing, and reconstructing concepts based on learning experiences. Meanwhile, students 'mathematics learning outcomes are influenced by several factors such as students' attitudes toward math and learning environment (Sumantri and Puspita, 2014, p.8). Thus, it is clear that mastery of mathematical concepts can not be obtained if the learning activities are limited to the transfer of subject matter from teacher to student.
A learned concept is not merely memorizing but comes to a thorough and profound understanding. Understanding mathematical concepts is directly related to students' mathematical abilities. *Conceptual understanding is an important component of proficiency* (NCTM, 2000, p. 20). Conceptual understanding is an important component needed to improve mathematical ability.
One of the objectives of learning mathematics in elementary schools listed in the curriculum is that students understand the concepts of mathematics, explain the interconnection between concepts, and apply the concept or algorithm in a flexible, accurate, efficient, and appropriate in solving problems (BSNP, 2006, p.148) . The demands of the curriculum must be poured in the learning process that can facilitate students in achieving that goal. Achievement of the objectives of mathematics learning is the responsibility of the teacher as the implementer of the curriculum. Standard processes mathematics education according to *the National Council of Teachers of Mathematics* (NCTM), namely: solving problems *(problem solving)*, reasoning and evidence *(reasoningand* proof), communication *(communication)*, connections *(connections)*, and representation *(representations)* (NCTM, 2000, p.29). Holmes states that problem solving is the *heart of mathematics* or the heart of mathematics (Zainuri, 2016, p .394). This is because in the course of problem solving mathematics knowledge needed about mathematics, problem solving strategies, and effective self-monitoring, and productive attitude in addressing and solving a problem. Mathematical problem solving can be mastered if students have a mathematical understanding of a learning material thoroughly and profoundly. Some

studies by international institutions show that Indonesian students' math skills are still low compared to other countries. One of them is the result of the *Program for International Student Assessment* 2015(PISA) initiated by the *Organization for Economic Cooperation and Development* (OECD), Indonesia received a score in the 396 math literacy category and was ranked 63 out of 70 countries (OECD, 2015, pp .5). This is in line with the results of a study by *Trends in International Mathematics and Science Study* (TIMSS) initiated by *The International for The Evaluation of Education Achievement* (IEA) in 2015, indicating that Indonesia's score in Mathematics is 397 of the average international level of 500. The overall Indonesian math score is ranked 44th out of 49 countries (Mullis, 2015, p.14). Therefore, the development of mathematical competence of students need to be improved one of them using the appropriate learning approach with regard to the characteristics of students.

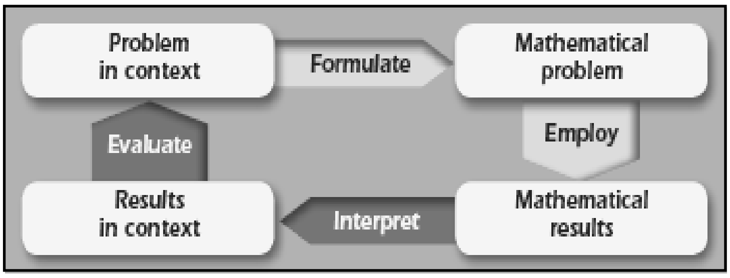

Figure 1.1
PISA's Model of Mathematical Literacy in Practice

Mathematical literacy examined by PISA promotes the ability of mathematical understanding that is oriented to the context of the problems of everyday life. Based on the analysis of the results of studies that have been done by PISA, one of the factors of low mathematical ability of students is due to Indonesian students are not accustomed to facing the questions of open questions that are contextual in everyday life. It becomes a challenge for teachers to develop mathematical understanding skills and present contextual math problems in everyday life.
The ability of mathematical understanding is one of the most important things teachers need to consider in determining the learning objectives. Mathematical understanding becomes the basis for students in solving various mathematical problems because students will be able to link and solve mathematical problems through conceptual understanding and procedural understanding that has been owned. In addition, the ability of mathematical understanding also becomes very important in improving various other mathematical abilities such as mathematical connection ability, mathematical communication ability and mathematical reasoning ability.
The principle in learning implies that learning with understanding is a very important thing that can ensure students overcome the problems it faces. In understanding not only understand an information but also includes objectivity, attitudes, meaning contained from an information. In other words a student can change the information that is in his mind into another form that is more meaningful. The understanding stage is more complex than the knowledge stage.
Understanding means building meaning from learning messages. *Determining the meaning of instructional messages, including oral, written, and graphic communication* (Krathwohl, 2002, p.215). The cognitive process of understanding dimensions in Bloom's taxonomic revision includes the following processes.

a. *Interpreting* (Interpreting)

Interpret that change from one form to another form or from one representation to another representation.

b. *Exemplifying* (Exemplifying)

Exemplifying that is, finding a specific example or illustration of a concept or principle.

c. *Classifyng* (Classify)

Classify is to define something that belongs to a category or specify that an instance belongs to a concept category or not.

d. *Summarizing* (Generalizing or Summarizing)

Summarizing or generalizing is the abstracting of common themes or main points or making statements that represent some of the information presented.

e. *Inferring* (Inferring or Concluding)

Concluding is the representation of the logical conclusion of the information presented or determining the pattern or understanding of some examples.

f. *Comparing* (Compare)

Compares is looking for a relationship between two ideas, objects or similar things. Determine the similarities and differences between two or more objects.

g. *Explaining* (Explain)

Explain that construct causal models of a system or build and use the causality of a concept (Kristiono, 2016, hlm.2).

The results of research conducted by Krista Meier in 2015 with the title *"Overcoming Math Anxiety: How Does Teaching Math Conceptually Impact Students Learning Math?"* Shows that *math anxiety is* related to the ability of mathematical conceptual understanding that affects the way students learn mathematics (Meier, 2015) . In addition, another research conducted by Ramirez under the title "*On The Relationship Between Math Anxiety and Math Achievement in Early Elementary Schools: The Role of Problem Solving Strategies"* shows that mathematics achievement in lower grade primary schools is related to *math anxiety* held by students (Ramirez, 2016).

Anxiety comes from an anxious base word that means no peace or anxiety for fear or fear of something. In line with that, Page and Thomas argued that "*Anxiety can be defined as a complex emotional response, often unconscious in origin, with fear or dread as its most notable characteristic*" (Haylock, 2007, p. 17). Anxiety is defined as a complex emotional response, often unconscious with fear as a characteristic characteristic of anxiety. This definition illustrates that anxiety as an emotional response that can inhibit the ability of individuals in optimizing their potential.

Anxiety can occur in any situation and condition, one of them in the learning activities of mathematics. Math anxiety is commonly referred to as *math anxiety*. Perry reveals that mathematical anxiety can be experienced by students at various levels of education, but it usually begins in elementary education (Sevey, 2012, p. 4). "*Math anxiety is a person's negative affective reaction to situations involving numbers, maths, and mathematics calculations."*(Ascharft & Moore, 2009, p.197) Mathematical anxiety is related to the affective response of a person in the form of fear or anxiety when dealing with and resolving issues related to numbers, mathematical symbols, or mathematical calculations.

Math anxiety is an emotional response of tense or fearful feelings to a mathematics lesson that affects a person's life in various conditions with respect to mathematics. Freedman defines mathematical anxiety as "*an emotional reaction to mathematics based on past experience that arms future learning*." So mathematical anxiety is an emotional reaction of students based on previous unpleasant experiences, which interfere with further learning. Hercraft and Kirk argue that anxiety about mathematics exacerbates performance in two ways.First, it leads to avoidance, which leads to downward competence.Secondly, it inhibits temporary work of memory capacity, possibly by failure to inhibit attention when the mind is disrupted (Haylock, 2007, p.17) .They argue that the findings they may explain why the most effective intervention for mathematical anxiety is cognitive-behavioral people.So teachers should help students want to learn to manage the anxiety itself.In addition, Cavanagh and Sparrow divide theindicator *math anxiety* into 3 domains including, *attitudinal i ndicators, cognitive indicators,* and *somatic indicators*. The following is an overview of theindicator *math anxiety* on each domain.

Math anxiety needs to be minimized through learning activities in accordance with students' mathematical competence. This is in line with the results of research done by Sevey in 2012 with the title *Mathematics Anxiety, Working Memory, and Mathematics Performance: Effectiveness of a Working Memory Intervention on Reducing Mathematics Anxiety*. Based on the result of this research, it can be concluded that *math anxiety* can be reduced through intervention of strengthening *working memory* in students. Strengthening *working memory* one of which can be done by doing learning that focuses on the reinforcement of conceptual mathematics. A learning approach that focuses on the cultivation of comprehensive and profound mathematical concepts is theapproach *concept-rich instruction*.

Concept-Rich Instruction (CRI) is a learning approach that takes into account conceptual, cognitive, and metacognitive thinking in learning as well as in the process of mathematical thinking (Benhur, 2006, p.vii). *Concept-rich instruction* is a mathematical learning approach based on constructivist understanding, meaningful learning theory, and problem-solving approach. The purpose of the use of this learning approach is that students can understand a comprehensive and thorough mathematical concept.

The learning process using theapproach *concept-rich instruction* includes five components: *practice* , decontextualization,, *meaning* generalization, *recontextualization* and *realization* . These five components are simultaneously carried out in an effort to instill a comprehension of the concept thoroughly and profoundly.

Relevant research related to the use of *concept-rich instruction* has been done by Rochyani under the heading "Increasing Strategic Competence, Adaptive Reasoning, and Student's Productive Disposition Through *Concept-Rich Instruction*". The results of this study indicate an increase in strategic competence, adaptive reasoning, and productive disposition by using thelearning approach *concept-rich instruction*.

Based on the problems and the findings of this research, this research is intended to know the ability of mathematical understanding which can be influenced by the use oflearning approach in *concept-rich instruction* terms of differences in *math anxiety* owned by students. Thus, the title raised in this study is "The Influence of *Concept-Rich Instruction* to the Traffic of Mathematical Understanding in terms of *Math Anxiety*".

METHOD

Method used in this research is the experimental method with the design design *Treatment by level* 2 X 2. Experimental research methods can be interpreted as research methods used to find the effect of certain treatment against others in controlled conditions. This study contains three research variables, namely independent variables, dependent variables, and moderator variables. The independent variable in this research is *concept-rich instruction*. The dependent variable is the ability of mathematical understanding (*mathematical understanding skill*). The moderator variable is mathematical anxiety (*math anxiety*).

This study uses two types of learning approach. Experiments were conducted on two groups of students thatgroups of *math anxiety* low andgroup. *anxiety math* high Students are treated with the use of *concept-rich instruction* learning approach and conventional learning approach The design description to be used in this research is as follows.

Table 3.1
Design Research
Design Treatment by Level 2x2

approach to *Math Anxiety*	Approach *Concept-Rich Instruction* (A1)	approaches conventional (A2)
Low (B1)	(A_1B1)	(A_2B1)
Height (B2)	(A_1B_2)	(A_2B_2)

Sugiyono (2010: 215) suggests that the sample is part of the population. Sampling technique in this study using *simple random sampling* according to Soewadji (2012: 137) is a way or sampling technique from the population in a random or simple random. The sample of this research is the third grade students of SD Negeri 1 Sindangkasih with the sample units selected class III A and III B as experimental class which will be given treatment by usingapproach *concept-rich instruction* as many as 45 students, while class III C and III D is chosen as control class who learn to use approach of learning as many as 45 students.
Furthermore, using aquestionnaire *math* anxiety, all students measured the *math anxiety* they had with 33% of thescores *math anxiety* lowestentered into thegroup *math anxiety* lowand 33% of thescores *math anxiety* highestentered thegroup *math anxiety* high. Data analysis in this research used two way analysis of variance (ANAVA) with *design treatment by level* 2x2. But beforehand, in order to test the hypothesis can be done, it is necessary to test the requirements analysis of the normality test and homogeneity test. Data obtained from research activities are processed to have meaning useful to answer the problems in research and to test the hypothesis.

RESULT AND DISCUSSION

1. Differences in the ability of mathematical understanding between groups of students learning with theapproach to learning *Concept-Rich Instruction* (A_1)are higher than the students' mathematical comprehension ability of the students learning with the conventional approach (A_2).

Result of analysis of variance (anova) in table 4.9 obtained value of $F_{arithmetic}$ = 13,68 more than $F_{table\ (0,05)}$ = 4,11. Based on the results of the calculation then H_0 rejected, it means there are differences in the ability of mathematical understanding of elementary school students who study with the approach of learning *Concept-Rich Instruction* (A_1) and students learning with conventional learning approach (A_2). Aadapun the average value of the group of students who are learning with the approach of learning *Concept-Rich Instruction* (A_1) and the average the average group of students studying with a conventional learning approach (A_2) are X_{A1} = 30 and X_{A1} = 27.4. Thus, it can be concluded that the mean value of the mathematical understanding ability between the learning group and theapproach *Concept-Rich Instruction* (A_1)is higher than the mathematical ability of a group of students learning with the conventional approach (A_2).

2. The influence of interaction between learning approach and *math anxiety* toward students' mathematical understanding.

The result of analysis of variance (anova) in table 4.9 obtained value of F_{count} = 46,61 more than $F_{table\ (0,05)}$ = 4,11. Based on the results of the calculation then H_0 rejected, meaning there is a significant interaction between the learning approach with *math anxiety* to students' mathematical understanding ability. The existence of interaction between learning approach used with *math anxiety of* elementary school student hence required further test. The advanced test used is the Tukey test because the number of subjects in each group is the same. Through Tukey test can be expressed the influence of interaction between the use of learning approach and *math anxiety of* elementary school students. This can be seen from the following graph.

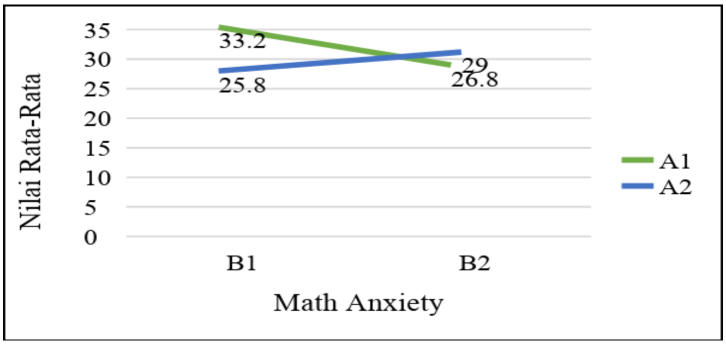

Figure 4.6

Interaction Chart between the Learning Approach and *Math Anxiety* to Student Mathematical Understanding Ability
Description:

A1 : *Concept-Rich Instruction*
A2 Approach: Conventional Learning Approach
B1 : *Math Anxiety* Low

B2 : *Math Anxiety* High

3. Differences in the ability of mathematical understanding between students learning usingapproach *concept-Rich instruction* with students learning to use conventional learning in groups of students with *math anxiety* low.

Testing of differences in mathematical understanding of elementary school students learning with *Concept-Rich Instruction* learning approaches with students learning with Conventional learning approaches in groups of students with *anxiety math was* lowconducted using the Tukey test. Tukey test calculation results show that Q_{count} = 10.525 and Q_{table} = 2.228. Therefore, H_0 rejected means that there is a significant difference in the ability of mathematical understanding of students learning with *Concept-Rich Instruction* learning approaches with students learning with Conventional learning approaches in groups of students with *anxiety math* low.

The average score of students learning with *Concept-Rich Instruction* learning approach with students learning with Conventional learning approach in groups of students who have *anxiety math* lowis X_{A1B1} = 33.2 and X_{A2B1} = 25.8 or $X_{A1B1} > X_{A2B1}$. The results of these calculations show that the ability of students' mathematical understanding between groups of students who are studying withlearning approach *concept-richinstruction* which has a *math anxiety* lowis higher than the ability of mathematical understanding of students learning with conventional learning approaches which have *math* highanxiety.

4. Differences in the ability of mathematical understanding between students learning usingapproach *concept-rich instruction* with students learning to use conventional learning in groups of students with *anxiety math* high.

Testing of differences in mathematical understanding of elementary school students learning with *Concept-Rich Instruction* learning approaches with students learning with Conventional learning approaches in groups of students with *anxiety math was* highconducted using Tukey test. Result of Tukey test calculation show that Q_{count} = 3,185 and Q_{table} = 2,228. Therefore, H_0 rejected means that there is a significant difference in the ability of mathematical understanding of students learning with *Concept-Rich Instruction* learning approach with students learning with Conventional learning approach in groups of students who have *anxiety math* high.

The average value of students who study with the approach of learning *Concept-Rich Instruction* degan students who learn with the approach of Conventional learning in groups of students who have *anxiety math* highnamely X_{A2B2} = 29 and X_{A1B2} = 26.8 or $X_{A2B2} > X_{A1B2}$. The results of these calculations show that the ability of students' mathematical understanding between groups of students who are studying withlearning approach *concept-richinstruction* which have *math anxiety* highis lower than the ability of mathematical understanding of students learning with conventional learning approaches that have *math* lowanxiety.

DISCUSSION

1. Differences in the ability of mathematical understanding between groups of students learning withlearning approaches *Concept-Rich Instruction* (A_1)are higher than the students' mathematical understanding of students learning with conventional approaches (A_2).

Students who use problem based learning model show activity in learning process. Students show interactive and communicative behaviors among students one at another in the process of problem solving. This is in accordance with what Muiz expressed (2017, p.5) that through PBL learning, students have the ability to communicate scientifically in their discussions or presentations of work.

1) Interaction between learning model and learning metacognition students to the ability to solve mathematical problems. (INT AXB)

The application ofmodel *Problem Based Learning* has an effect on improving math problem solving ability. Through the model of *Problem Based Learning* in the learning process to make students learn actively, interactive and communicative kratif.

Students with high learning metacognition exhibit interactive learning activities, better manage and solve problems and demonstrate a more critically active and well-controlled mindset when dealing with problems. Furthermore, students who have high metacognition in PBL learning process can control the learning activities and be able to understand the problem accompanied by problem-solving strategies. In contrast, students who have low learning metacognition show difficulties in controlling learning activities and difficulties in understanding and solving problems encountered.

2) Differences in mathematical problem-solving abilities between students learning to use the model *Problem Based Learning* with students learning to use expository methods in groups of students with high learning metacognition.

PBLs can encourage students to have problem-solving skills in real-life situations, their ability to build knowledge through learning activities, scientific activities in students through group work and have the ability to communicate scientifically in discussions or presentations of their work. Students with high metacognition can more quickly take action in each learning activity because it has a prior preparation, whereas in students with high metacognition through expository methods less able to regulate learning activities due to the activities regulated by the teacher.

Metacognition of students with the application of expository method can only show interaction through question and answer process only without any learning strategy which gives the students opportunity to be more active in the process of solving mathematical problems. Basically the application of expository methods is only done by the teacher without giving full opportunities to the students to find their own solution to solving mathematical problems. Furthermore, with high metacognition through PBL learning model, students are able to understand problems quickly, able to analyze problems, use fast and appropriate strategies in the problem solving process, make quick decisions, always reflect on the answers, show problem solving skills either with the use of strategy problem solving over and over, and can conclude the solution of the existing problem.

3) Different mathematical problem-solving abilities between students learning to use the model *Problem Based Learning* with students learning to use expository methods in groups of students with low learning metacognition.

Mathematics learning activities conducted with PBL learning model is a learning with student-centered activities through group stages in solving contextual problems in learning controls are fully student-centered learning. While expository learning is learning with verbal activity that is implemented by the teacher to the students through lecturing strategy and assignment, which means the control of the learner becomes the task of the teacher completely, so that students with low metacognition can control the learning activities better. As the characteristics of Trineke (in Setyadi, Subanji and Muksar, 2016, p.2) to students with low metacognition, showing inadequacy in problem solving, lack of understanding of the context of the problem, difficulty in determining steps and problem-solving strategies, and not taking action reflection in determining the answers so that teachers need guidance and direction in doing problem solving math. On the other hand, through PBL learning model with low metacognition, it is less able to step the problem strategy by itself by doing self reflection action on problem solving.

CONCLUSION

This research uses experimental method involving independent variable, that is model *problem based learning*, expository method and metacognition study, while as dependent variable is the ability of problem solving of mathematics students of District 1 Elementary School Cieurih Cipaku.

Based on the results of data analysis, the results of hypothesis testing and the results of research discussions that have been obtained are explained some conclusions as follows:

1. model *Problem-based learning* has a higher value influence from expository methods to the ability of solving mathematical problems.
2. There is an interaction between learning models and learning metacognition on mathematical problem-solving abilities.
3. Students who have high learning metacognition, mathematical problem solving skills between groups of students who taught the model *problem based learning* is higher than the group of students who were taught using expository methods.
4. Students who have low learning metacognition, mathematical problem-solving skills between groups of students taught using models *problem-based learning* are lower than in the group of students taught using the expository method.

REFERENCES

[1] Chairani, Zahra, Student Metacognition Behavior In Mathematical Problem Solving, Didactic Math: Journal of Mathematics Education Vol. 1, No. 3, 2015

[2] Setyadi, Danang, et al. Identification of Students' Metacognition Level in Solving Mathematics Problem about Sequence. *IOSR Journal of Research & Method in Education. Volume 6, Issue 6 Ver. IV (Nov. - Dec. 2016)*

[3] Danoebroto, Sri Wulandari, Meningkatkan Kemampuan Pemecahan Masalah melalui Pendekatan PMRI dan Pelatihan Metakognitif, Jurnal Penelitian dan Evaluasi Pendidikan, No. 1, 2008.

[4] Dunlosky, John & Metcalfe, Janet. 2009. *Metacognition.*California: Sage

[5] Hosnan, (2014) *Pendekatan Saintifik dan Kontekstual dalam pembelajaran abad 21*. Bogor: Ghalia Indonesia

[6] Iqbal, Afia dkk. The Effects of Metacognitive Instruction on Higher and Lower Achiever in Solving Mathematical Word Problems. *Journal of Elementary Education Vol.27, No. 1 2015.*

[7] Kazemi, F, Reza,M Sahar,B. A Subtle View to Metacognitive Aspect of Mathematical Problem Solvin. *International conference on Mathemtics Education Research, Issue 8, 420-426, 2010.*

[8] Maarifm Hanafi, Wahyudi, Eksperimentasi Problem Based Learning dan CIRC dalam Menyelesaikan Soal Cerita Matematika Siswa Kelas 5 SD, *Scholaria, Vol. 5, No. 2, Mei 2015 97 – 115*

[9] Organization of Economic Cooperation and Development. *Programme for International Student Assessment 2015 Results in Focus* (OECD: 2015).

[10] Rani, Rekha & Govill, Punita Metacognition And Its Correlates: *A Study. International Journal of Advancement in Education and Social Sciences (2013) Vol.1, No.1, 20-25*

[11] Ruchaed, Diding dkk. Pengaruh *Problem Based Learning* (PBL) Terhadap Kemampuan Heuristik Pemecahan Masalah dan Sikap Matematis Siswa Sekolah Dasar, *Jurnal Eduhumaniora Pendidikan Dasar* Vol 7, No 1, 2017 Topcu, A. Ubuz, B. 2008.*The Effect of the metacognitive Knowledge On the Pre-Services Teacher, participation In the Asyncronous Online Forum. Educational Tecnology and Society.*

[12] Setyadi Danang. Identification Of Students' Metacognition Level In Solving Mathematics Problem About Sequence. *IOSR Journal of Research & Method in Education (IOSR-JRME) Volume 6, Issue 6 Ver. IV (Nov. - Dec. 2016).*

[13] Siregar, Jumaisyaroh ,Tanti, *Peningkatan Kemampuan Pemecahan Masalah Matematis Siswa SMP Melalui Pembelajaran Kooperatif Tipe STAD*, Jurnal Mathematic Paedagogic Vol 2, No 1 (2017)

[14] Slavin,Robert E. 1994. *Educational Psychology and Practice*. Massauchement: Allyn and Bacon

[15] Soewadji, Jusuf. *Pengantar Metodologi Penelitian*. Jakarta: Mitra Wacana Media, 2012.

[16] Sriyanto, HJ.2009. *Strategi Sukses Menguasai Matematika.*Yogyakarta: Galang Press

[17] Sugiyono. *Metode Penelitian Kuantitatif Kualitatif dan R&D.* Bandung: Alfabeta, 2010.
[18] Suharnan. 2005. *Psikologi Kognitif*. Surabaya: Srikandi.
[19] Sumantri.2015. *Strategi Pembelajaran Teori dan Praktik di Tingkat Pendidikan Dasar*. Jakarta: PT Raja Grafindo Persada
[20] Syarifuddin, Ahmad. Penerapan Model Pembelajaran Cooperative Belajar dan Faktor-Faktor yang Mempengaruhinya. *Jurnal TA'DIB IAIN Raden Fatah Palembang, Vol. XVI, No. 01, Ed, Juni 2014.*
[21] Tohir Zainuri, Abdur Rahman As'ari, dan I Made Sulandra, "Analisis Kemampuan Siswa dengan Gaya Kognitif Field Independent dalam Mememecahkan Masalah Matematika Berdasarkan Langkah-Langkah Polya", Prosiding Seminar Nasional Universitas Kanjuruhan Malang, 2016.
[22] Turana, Sevgi dan DemirelbIn,Özcan. What Level And How Medical Students Use Metacognition? A Case From Hacettepe University. *Journal Procedia Social and Behavioral Sciences Vol. 2 No.1 2010.*
[23] Wells Adrian. Metacognitive theraphy for Anxiety and Depression. *Cognitive Behavioral Therapy Book reviews, Issue 6, 1 2010*

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