4th ICRIEMS Proceedings
Published by The Faculty Of Mathematics And Natural Sciences
Yogyakarta State University, ISBN 978-602-74529-2-3

Creativity of Students in the Opened Mathematics Problem Solving in terms of Learning Styles

Nanang Diana

Lecturer of Mathematics Education, Mathematic Education Courses, STKIP Taman Siswa Bima
Jl Pendidikan Taman Siswa No 1, Palibelo, Bima, Nusa Tenggara Barat, Indonesia

diana.nanang@yahoo.com

Abstract. This study uses an exploratory study with a qualitative approach that aims to describe students' creativity in an opened mathematic problem solving in terms of learning styles. Assessment of creativity based on an opened mathematic problem solving assessment is completed by the subject to review three aspects of creativity, namely Fluency, Flexibility and Newness. The subjects of study consist of three students of SMP Negeri 4 Bolo Bima district in three learning styles; namely Visual learning styles, Auditory and Kinesthetic. Phase of the study began with the selection of research subjects which determined based on learning styles test. Then followed by giving an opened mathematic problem-solving task and also interview. Validity of the data is performed by using the triangulation time is that giving an equivalent opened mathematic problem-solving task. The results of the study show that the subjects with Visual learning styles in Algebra and also the Geometry problem meet three indicator of creativities; namely, Fluency, Flexibility and Newness. Subjects with Auditory learning style in Algebra problems meet two indicators of creativity, they are Influence and Newness, while the Geometry problem of the Auditory subject only meet one indicator of creativity; namely Fluency. And subjects with Kinesthetic learning style in Algebra problems and Geometry problem only meet one indicator of creativity, namely Fluency.

INTRODUCTION

Mathematics is one of the basic science in accelerating the mastery of science and technology. To face the challenges of science and technology development, it is also needed resources that have high skills involving critical thinking, logical, creative and a good ability to cooperate.

Creativity is a quality that is very interesting to study but it is quite complicated, causing a variety of different views. Murniati (2012) explains that creativity is defined differently, depending on how one defines it. Creativity is the domain of psychology that is complex and multidimensional inviting diverse interpretations, definitions of creativity provide different pressures, depending on the basic theory that is the reference of making such creativity definition (Munandar, 2009: 9).

Creativity according Lumsdaine (2007) is a dynamic brain activity involving unconscious and conscious mentality that process both unconscius and conscious mentality and create something. "Creativity is a dynamic, whole brain activity that involves the conscious and subconscious mental processing in both idea generation and making something happen ".Munandar (2009) states that creativity is the ability to see or think about things that are extraordinary, unusual, combining seemingly unrelated information and spark new solutions or new ideas that indicates smoothness, suppleness and orisionalitas in thinking. The characteristics of creativity can be divided into two cognitive traits (aptitude) and non-cognitive traits (nonaptitude). Cognitive traits of creativity consists of originality, flexibility and smoothness. While non-cognitive traits of creativity include motivation, personality, and creative attitude. Creativity good covering characteristics of cognitive and non-cognitive traits is one of the important potential to be nurtured and developed.

Wulan (2004) revised Bloom's taxonomy of the cognitive aspects into two dimensions; namely: the dimensions of cognitive processes and dimensions of knowledge. The revised salient dimension of cognitive processes is the elimination aspect of the synthesis, then added the creativity aspect after aspect of evaluation. This shows that creativity is the highest level in the cognitive aspects that will be achieved if the five levels can be controlled. The importance of the development of creativity has four reasons, namely:

1. With creativity, people can manifest theirself, the self-realization is one of the basic necessities of human life. Munandar states (2009) creativity is also a manifestation of someone who is fully functional in the embodiment him.
2. Creativity as the ability to see the possibilities to solve a problem, a way of thinking that is still less attention in formal education. Students are required to think more linear, logical, reasoning, memory or knowledge that demands the most appropriate response to the problems given. Creativity that demands a creative attitude of individuals that need to be cultivated to train children to think flexibly (flexibility), smoothly (own fluency), originally (Originality), outlines (elaboration) and reformulated (redefinition) which is characteristic of creative thinking put forward by Munandar (2009).
3. Implicated themselves creatively not only beneficial, but also giving satisfaction to the individual.
4. Creativity allows humans to improve the quality of life. In fact, the creativity of students in mathematics has not been noticed by the teacher completely. The learning activities have been focused on the students. Students work in groups to learn and is responsible for the worksheets provided by the teacher. But the given problem is limited to the material taught by example that has been preceded by a teacher, not a math problem. Giving routine matter as it makes the students just to master the technique that has been exemplified earlier settlement and does not provide space for students to be creative with previous mathematical experience.

Based on interviews with teachers of mathematics courses, some of the factors that cause that it is not possible to nonroutine problems Award is a limited time, the density of the material and the difficulty of developing assessment that meets the creativity aspect. Generally some other constraint mathematics learning is still relevant to the strategy of traditional learning, learning centered on the teacher (teachercentered approach) or the use of learning model that did not emphasize creativity, evaluation system which has been used only measure of learning achievement as if studying mathematics only emphasize results not on the process. Learning achievement tests generally only lead to a way of thinking converges.

To cultivate and hone the creativity of students, then students should be introduced to mathematical problems that challenge and stimulate learners to think. That is in accordance with one of the goals of mathematics learning in 2006 the curriculum so that students have the ability to solve problems that include the ability to understand the problem, devised a mathematical model, solve the model and interpret the obtained solution. Mathematics education experts said the problem is a question to be answered or responded. But every question does not necessarily become a problem. A question would be a problem if the question was to show the existence of a challenge (challenge), which can not be solved by a routine procedure (routine procedure) that is already known by the perpetrator, as stated Cooney (2004) follows "..... for a question to be a problem, it must present a challenge that can not be resolved by some routine procedure known to the student ". Math problems will only be solved if students have the motivation, creative thinking abilities, skills and knowledge of the problems given in addition to other aspects. Aspects of motivation, creative thinking and creativity skills are interrelated components. Aspects of creative thinking and skills are two aspects related to cognitive function can be measured by the problem solving process and product solutions.

In this study, to determine the students' creativity in solving math problems is to leave the task of solving the problem (TPM) on the students and they were asked to finishing. Furthermore, the students' answers were analyzed based on three components of creativity, namely: fluency (fluency), flexibility (flexibility), and novelty (novelty).

Furthermore, Silver (1997) also describes the relationship between the components of problem solving and creativity shown in Table 1 as follows:

TABLE 1. The Corelation of Problem Solving & Creativity Components

Creativity	**Problem solving**
Fluency	Students explore open-ended problems, with many interpretations, solution methods or answers
Flexibility	Students solve (or express or justify) in one way, then in other ways. Students discuss many solution methods
Novelty	Students examine many solution methods or answers (expressions or justification), then generate another that is different

(Resource, Silver 1997)

Fluency in problem solving: Students resolve open issues with a variety of interpretations, many of completion method or the correct answer. Operationally fluency in problem solving refers to the ability of students to answer diverse problems and correct. Some answers to the problem is said to vary, if the answers seem different or follow a certain pattern.

Flexibility in problem solving: Students solve problems in one way, then another manner different. Students discuss the various finishing methods operationally flexibility in problem solving refers to the ability of students to solve problems in ways different novelty in problem solving: Students examine several methods of settlement or answers, then make others different.

Operationally, novelty refers to the ability of students to answer the problem in several ways different from the previous and the right values or one unsual that is done by student in the level of knowledge. "Unusual" answer in question is an answer that made involving knowledge or mathematical concepts that have not been taught or rarely thought of by students at the knowledge level peers.

Besides creativity is also described in terms of student learning styles. Each student certainly has its own way to understand the information. In reaching an understanding of a thing, the students need to go through a learning process that will involve the experience. Because each student can only process information in different ways. Thus, learning styles of every student can be different (Fleming, 1995). Many people have a mix of learning styles. There also one who will find that he has a kind of learning style that is dominant over the other types. However, there is not a composition of learning styles that are superior to the other (Prashning, 2007). Because learning style is a special way and usually carried a person in acquiring knowledge, skills or attitudes through study or experience (Fleming: 2006). Many behavioral characteristics that are clues to the tendency of one's learning style; namely learning styles are visual, auditory and kinesthetic.

RESEARCH METHOD

Types of research

This research is exploratory research with a qualitative approach for the setting is the natural background research and the main instrument is the researcher's own research. In-depth analysis is conducted on the student's learning style visual, auditory, and kinesthetic. Of the three learning styles can be known students' creativity in solving math problems.

Research subject

Subjects in this study is the third grade students of SMP, each of which has a learning style visual, auditory, and kinesthetic. To determine the study subjects, the student are given TGB (Learning Style Test) with the learning styles questionnaire developed by Chislett & Chapman (2005: 1-5). The list of the learning style question contains 30 the question, with three possible answer. in selecting one of the answers there, is no right or wrong answer. However, the selection of the response determines the student's learning style. A student with choosing an answer at most, it is a visual learning style. Students with choosing an answer and at most, it is the auditory learning style, students with choosing an answer C at most, it is a kinesthetic learning styles.

Data collection technique

Data collection techniques in this study is the provision about the TPM and interviews. Subjects were asked to solve problems the next TPM researchers interviewed the study subjects in more depth in order to verify the test data is written. In addition, interviews were also used to gain new information which may not be obtained when the written test, because not all of the students thought were able to write. This may be revealed when the interview isconducted. To ensure the validity of the data, the credibility test is run by using a triangulation of time. In this study, data are collected twice with the distance between the first and second data collection is one week. The data can then be compared. Data is said to be valid if there is consistency or similarity of views between the first data and the second data. If the data obtained is not valid, then the data collection is repeated until the data obtained is valid.

Data analysis technique

Analysis of the data in this study refers to the stage of qualitative data analysis by Miles and Huberman (2009: 16-19), namely: (1) data reduction phase, aims to sharpen, classify, direct, dispose of unnecessary, and organize data in a way such that the final conclusions can be drawn and verified; (2) Stage presentation of the data, at this stage, data is categorized and presented in the form of narrative text with reference to indicators of creativity that has been presented in Table 1, allowing researchers to draw conclusions from such data; (3) Phase conclusion, based on the analysis of the data that has been presented and discussed clearly based on the phases

that have been set. Furthermore, drawing conclusions in this study aimed to describe the students' creativity in solving math problems open in terms of learning styles.

Research procedure

Research procedures used by the researchers consists of four stages, namely: (1) planning, done by designing a research instrument consisting of a learning styles test, TPM and interview, followed by validating and analyzing the results of the validation instrument; (2) the implementation phase to determine the subject of research using learning styles test, then give TPM to every subject of study is accompanied by an interview-based tasks; (3) the data analysis stage by analyzing the work of the subject and the interviews then describe the results of data analysis, and (4) the stage of preparation of reports.

RESULTS AND DISCUSSION

In this study, the data were analyzed in the form of the answer to the problem solving (TPM) and interviews related to student's creativity in open mathematical problem solving. Data from interviews are recorded using the voice recorder. The data is then transcribed to facilitate researchers to analyze. The results of the analysis of the results of interviews and TPM each subject as follows.

Student creativity with visual learning style in solving open math problems
the results showed that subjects with visual learning styles are able to solve problems well and can understand the problem by reading and reading it silently. In addition, they can retell the meaning of the questions asked. This is in line with what DePorter and Hernacki (2001: 116) have expressed that the characteristics of the visual learning style are "remembering with visual associations".
In TPM-1.1 and TPM-2.1, Subjects with visual learning styles meet three indicators of creativity: fluency, flexibility and novelty. The subject is fluent in making the system of linear equations requested with the set of resolutions equal to the given set of settlements. SV is also flexible in troubleshooting, being able to solve the problem in more than one way. Additionally SV creates a new way of creating a system of linear equations by providing a system of linear equations whose coefficients are other than integers. While on TMP-1.2 and TPM-2.2, Subjects with visual learning styles are able to meet three indicators of creativity as well namely fluency, flexibility and novelty. Subjects eloquently draw a plane that is the same width as the known form. SV is also flexible in troubleshooting, being able to solve the problem with more than one way of drawing another plane. In addition SV also makes a uniform plane that has not been unknown the name of the form.

Student creativity with an auditory learning style in solving open math problems
The results showed that subjects with auditory learning styles understood the problem by reading the problem slowly and while moving the lips, can recount the problem and can mention the known and asked in the problem while occasionally voicing .. This is in accordance with the disclosed DePorter and Hernacki (2001: 118) that the characteristics of the auditory learning style is "to move the lips and pronounce the writing on the book when reading".
In TPM-1.1 and TPM-2.1, Subjects with auditory learning styles only meet two creativity indicators of fluency and flexibility. The subject is fluent in making the system of linear equations demanded by the set of resolutions equal to the set of settlement systems of given linear equations. Subjects are also flexible in troubleshooting, being able to solve the problem in more than one way. Then the subject does not create new shape and way in making system of linear equation by giving system of linear equation coefficient besides whole number. While on TMP-1.2 and TPM-2.2, Subjects with auditory learning styles only meet one indicator of creativity as well i.e. fluency. Subjects eloquently draw a plane that is the same width as the known form. The subject gives only one other way to draw another plane so the SA is not flexible in solving the problem. In addition, SA also does not make a combined flat form.

Student creativity with kinesthetic learning style in solving open math problems
The results showed that subjects with kinesthetic learning styles were able to solve the problem well, able to understand the problem by reading silently while moving the ballpoint pen and pointer, showing the finger of the question. This is in accordance with what DePorter and Hernacki (2001: 118) have expressed that the characteristics of the kinesthetic learning style are "using the finger as a guide when reading".
In TPM-1.1 and TPM-2.1, subjects with kinesthetic learning styles are only able to meet one indicator of creativity is fluency. The subject is fluent in making the system of linear equations demanded by the set of

resolutions equal to the set of settlement systems of given linear equations. SK does not meet flexible indicators for troubleshooting, as it is unable to solve the problem in more than one way. In addition, SK also does not meet the novelty indicator because the subject does not create new shapes and ways in creating a system of linear equations by providing a system of linear equations whose coefficients are not integers. While in TMP-1.2 and TPM-2.2, subjects with kinesthetic learning style are also only able to meet one indicator of creativity that is fluency. Subjects eloquently draw a flat shape plane that is the same width as the known form. SK does not meet the flexible indicators in solving the problem, because it is unable to solve the problem with more than one way to draw another plane. Besides that SK also does not meet the novelty indicator because the subject does not make a combined plane.

The description of student Creativity in open math Problem Solving In terms of Learning Styles.

Indicator of Creativity:

TABLE 2. The Description of Student Creativity in Open Math Problem Solving In terms of Learning Styles

No.	Indicator of Creativity	Visual Subject		Auditory Subject		Kinesthetic Subject		Conclusion
		Matter Algebra	Matter Geometry	Matter Algebra	Matter Geometry	Matter Algebra	Matter Geometry	
1.	Fluency	Subjects created two systems of linear equations which its set completions are equal to the set completion of known system of linear equations.	Subjects drew two two-dimentional figures which their areas are equal to the area of known two-dimentional figure.	Subjects created two systems of linear equations which their set completions are equal to the known set completion of system of linear equations	Subjects created two forms of two-dimentional figures which their areas are equal to the area of known two-dimentional figure.	Subjects created two systems of linear equations which their set completions are equal to the set completion of known systems of linear equations.	Subjects created two forms of two-dimentional figures which their areas are equal to the area of known two-dimentional figure	Visual subjects, auditory subject and kinesthetic subject resolved open issues by various interpretations, many of completion method or the correct answer
2.	Flexibility	Subjects made three different ways to determine the required system of linear equations in the problem and true.	Subjects made three different ways to determine the area of the other two-dimentional figue by using the area formula of trapezoid, triangle area and divide the rectangle into 4 sections, each of which has the size of the sides and the	Subjects created two different ways to determine the system of linear equations that are requested and true.	Subjects only make one different way to determine the area of the other two-dimentional figure using the triangle area formula by dividing it into two equal parts and divide the rectangle into three parts.	Subjects did not create different ways to determine the required system of linear equations	Subjects did not create different ways to determine the area of the other two-dimentional figures.	Visual subjects resolved the problem with a variety of different ways

			right value.					
3.	Novelty	Subject created a system of linear equations which their coefficients are other than integer, in the form of fractions.	Subject drew shapes of combined two-dimentional figures which the name of it are not known and not been taught yet in their class.	Subjects did not create a system of linear equations which their coefficients are other than integer	Subjects did not create new two-dimentional figure or the other combination of two-dimentional figure.	SK did not create a system of linear equations which its coefficient is other than integers.	Subjects did not make the shape of two-dimentional figure combined from other various two-dimentional figures.	Visual subjects checked several methods of settlement or an answer, then make more distinct and true value or an unusual answer done by students in their age level.

CONCLUSION

Creativity of students with a visual learning style in solving open math problems.

a. Fluency
In solving algebra problems, subjects with a visual learning style capable of making two sets of linear equations that accomplishment system settlement equal to the set of linear equations is given, in a matter of geometry, drawing the two forms of the subject along with their sizes Flat correctly. Thus solving mathematical problems created by the subject meets the indicatorsfluency.

b. Flexibility
In solving algebra problems, subjects with a visual learning style using three other ways to get ystem linear equation requested, while the geometry problems, the subject also use another way to draw the two forms of flat wake he had held previously and has extensive equals flat known. Thus solving the problems created by the subject meets the indicators of flexibility.

c. Novelty
In solving algebra problems, subjects with a visual learning style make new system linear equation coefficients other than an integer, while the geometry problems, the subject also made Flat combination of several others and flattening waking name unknown. So solving the problems created by the subject meets the novelty indicators.

Creativity of students with auditory learning styles in solving open math problems

a. Fluency
In solving algebra problems, subjects with auditory learning styles to create two sets of linear equations system, accomplishment system settlement equal to the set of linear equations is given, geometry problems, the subject is also drawing the two forms of flat wake and its size correctly. Thus solving mathematical problems created by the subject meets the indicators fluency.

b. Flexibility
In solving algebra problems, subjects with auditory learning style using two other ways to obtain the requested ystem linear equations. Thus solving the problems created by the subject meets the indicators of flexibility. While the geometry problems, the subject uses only one other way to draw the shape Flat has an area equal to the known flat wake. Thus solving the problems created by the subject does not meet the indicators of flexibility.

c. Novelty
In solving algebra problems, subjects with auditory learning style does not create new ystem linear equation coefficients other than integers, and geometry problems, the subject also did not make a flat wake

combination which has an area equal to that obtained previously flat wake. So troubleshooting made by the subject does not meet the novelty indicators.

Creativity of students with kinesthetic learning style in solving open math problems

a. Fluency
   In solving algebra problems, subjects with kinesthetic learning style to make two system accomplishment set of linear equations is equal to the set of linear equations ystem settlement given, geometry problems, the subject is also drawing the two forms of flat wake and its size correctly. Thus solving mathematical problems created by the subject meets the indicators fluency.
b. Flexibility
   In solving algebra problems, subjects with kinesthetic learning style did not use other means to obtain the requested ystem linear equations and geometry problems, the subject also did not use other means to draw two forms Flat has an area equal to the known flat wake. Thus solving the problems created by the subject does not meet the indicators of flexibility.
c. Novelty
   In solving algebra problems, subjects with kinesthetic learning style does not create new ystem linear equation coefficients other than integers, and geometry problems, the subject also did not make Flat combination of several others. So solving problems created by such a subject is not meet the novelty indicators.

REFERENCES

1. Arikunto, Suharsimi. 2006. *Proses Penelitian, Suatu Pendekatan Praktik*. Jakarta : Rineke Cipta
2. Bentley, Joseph. 1966. *Creativity dan Academic Achievement*. The Journal of Educational Research volume 59 no 16. Clark Uniersity
3. Bungin, Burhan. 2012. *Analisi Data Penelitian Kualitatif*. Jakarta: PT RajaGrafindo Persada.
4. Chislett, V dan Alan Chapman. 2005. *Multiple Intelligences Test – Based on Howard Gardner's MI Model (youngpeopleversion).*http://www.bussinessball.com/freepdfmaterials/free_multiple_intelligences_test_young_people.pdf diakses tanggal 10 oktober 2012
5. Csikszentmihalyi, Mihaly. 1997. *Creativity*. New York : HarperPerennial
6. Davis, Robert B. 1984. *Learning Mathematics the Cognitive Science Approach to Mathematics Education*. London & Sydney: Croom Helm.
7. Depdiknas (2006). *Permendiknas Nomor 22 Tahun 2006 Tentang Standar Isi Sekolah Menengah Atas.* Jakarta: Depdiknas.
8. Depotter, Bobbi & Hernacki, Mike. 2005. *Quantum Learning*. Bandung: Kaifa PT Mizan Pustaka.
9. Direktorat Jenderal Peningkatan Mutu Pendidik dan Tenaga Kependidikan, Depdiknas. 2008. *Kreativitas*. Jakarta : Depdiknas.
10. Gunawan, Adi W. 2006. *Genius Learning Strategy. Petunjuk Praktis Untuk Menerapkan Accelerated Learning.* Jakarta: PT.Gramedia Pustaka Utama.
11. Filsaime, Dennis K. 2008. Menguak Rahasia Berpikir Kritis dan Kreatif. Jakarta: PT.Prestasi pustakaraya.
12. Harris, Robert 1998. *Introduction to Creative Thingking*. http://www.virtualsalt.com/crebook1.htm diakses tanggal 26 Desember 2012.
13. Haylock, Derek. 1997. *Recognising Mathematical Creativityin Schoolchildren.* http://www.emis.de/journals/ZDM/zdm973a2.pdf *diakses tanggal 26 Desember 2012*
14. Hudojo, Herman. 2001. *Pengembangan Kurikulum dan Pembelajaran Matematika*. Universitas Negeri Malang
15. Ideational Fluency andother Characteristics of Creative Individuals. http://www.is.wayne.edu/drbowen/CRTVYW99/Guilford.htm
16. Kusuma,Yuriadi. 2010. *Creative problem solving.* Jakarta : Rumah Pengetahuan
17. Lumsdaine**,** Edward. 2007. *Creative Problem Solving in Capstone Desi*gn http://www.innovationtoday.biz/pubs/2007_ASEE_CPS_Design.pdf. Diakses tanggal 03 Oktober 2012.
18. Lumsdaine**,** Edward. 2007. *Entrepreneur, creativity anda innovation.* Universita of Pretoria.http://www.ee.up.ac.za/main/_media/en/undergrad/subjects/snv111/lecture_2_and_3_part1.pdf. Didownload tanggal 03 Oktober 2012.
19. Miles dan Huberman. 1992. *Analisis data Kualitatif*. Jakarta : UI press
20. Moleong, J., Lexy.2010. *Metodologi Penelitian Kualitatif*. Bandung: PT.Remaja Rosdakarya.
21. Mulyasa, E. 2006. *Kurikulum Tingkat Satuan Pendidikan*. Bandung Rosda.
22. Munandar, Utami. 2009. *Pengembangan Kreativitas Anak Berbakat*. Jakarta : Rineka Cipta.

23. Murniati, Endyah. 2012. *Pendidikan dan Bimbingan Anak Kreatif*. Yokyakarta: PT Pustaka Insan Madani.
24. Napitupulu, Ester. 2009. *Kreativitas Pembelajaran Matematika Terus Berkembang*. Jakarta : Kompas.
25. Pehkonen, Erkki. 1997. The State-of-Art in Mathematical Creativity. http://www.emis.de/journals/ZDM/zdm973a1.pdf diakses tanggal 26 Desember 2012.
26. Polya, G. 1973. *How To Solve it* . New Jersey : Princeton University Press.
27. Scoenfeld, Alan. 1985. *Mathematical Problem Solving*. Florida : Academic Press
28. Semiawan, Conny. 1997. *Perspektif Pendidikan Anak Berbakat*. Jakarta : Grasindo
29. Semiawan, Conny. 2010. *Kreativitas keberbakatan. Mengapa, Apa dan bagaimana*. Jakarta: PT Indeks.
30. Shadiq, Fajar. 2004. *Pemecahan Masalah, Penalaran dan Komunikasi*. Pusat pengembangan dan penataran guru, Yogyakarta.
31. Shadiq, Fajar. 2004. *Psikologi Pembelajaran*. Pusat pengembangan dan penataran guru, Yogyakarta.
32. Silver, Edward A. (1997). *Fostering Creativity through Instruction Rich in Mathematical Problem Solving and Thinking in Problem Posing*. http://www.emis.de/journals/ZDM/zdm973a3.pdf. Diakses tanggal 26 Desember 2012.
33. Siswono, Tatag Y. E. 2008. *Model Pembelajaran Matematika Berbasis Pengajuan dan Pemecahan Masalah untuk meningkatkan Kemampuan Berpikir Kreatif.* Unesa University Press
34. Siswono, Tatag Y. E. 2007. *Penjenjangan Kemampuan Berpikir Kreatif Dan Identifikasi Tahap Berpikir Kreatif Siswa Dalam Memecahkan Dan Mengajukan Masalah Matematika.* Disertasi, Universitas Negeri Surabaya
35. Sugiyono. 2010. *Metode Penelitian Pendidikan. Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: ALFABETA
36. Sukmadinata, Nana. 2008. *Metode Penelitian Pendidikan*. Bandung : Rosda
37. Tabbakh, Nabil. 1998. *Creativity and Medical Education.* Al-Azhar Medical School.
38. Torrance, Paul. 1993. *Understanding Creativity: Where to Start?* Psychological Inquiry, Vol. 4, No. 3. (1993), pp. 232-234.
39. Trihadiyanti. 2006. *Mengembangkan Kreativitas Anak Melalui Pembelajaran Berbasis Masalah*. http://www.sdbinatalenta.com/arsipartikel/artikel_tri.pdf. Didownload tanggal 12 oktober 2012
40. Wulan, Ana. 2004. *Revisi Taksonomi Bloom.* Bandung : FMIPA UPI
41. Yamamoto, Kaoru and Davis. 1964. *Creative Thingking and Achievment Test item Responses of Elementary School Pupils: A Premilinary Investigation*. Kent State University Ohio.