

PROSIDING

*International Conference On Lesson Study
University of Muhammadiyah Malang*



Penerbit Universitas Muhammadiyah Malang

PROSIDING

International Conference on Lesson Study

University of Muhammadiyah Malang

Hak Cipta © Tim ICLS Universitas Muhammadiyah Malang, 2017
Hak Terbit pada UMM Press

Penerbit Universitas Muhammadiyah Malang
Jl. Raya Tlogomas No. 246 Malang 65144
Telepon: 0877 0166 6388, (0341) 464318 Psw. 140
Fax. (0341) 460435
E-mail: ummpress@gmail.com
<http://ummpress.umm.ac.id>
Anggota APPTI (Asosiasi Penerbit Perguruan Tinggi Indonesia)

Cetakan Pertama, Juni 2017

ISBN : 978-979-796-264-7

xiv; 347 hlm.; 21 x 29,7 cm

Desain Cover & Layout : Septian R.

Editor : Nur Widodo

Hak cipta dilindungi undang-undang. Dilarang memperbanyak karya tulis ini dalam bentuk dan dengan cara apapun, termasuk fotokopi, tanpa izin tertulis dari penerbit. Pengutipan harap menyebutkan sumbernya.

DAFTAR ISI

PENULIS	JUDUL	HAL
Afakhrul Masub Bakhtiar	IMPROVING SELF CONFIDENCE STUDENTS OF THE UNIVERSITY MUHAMMADIYAH OF GRESIK PGSD AT SUBJECTS TEACHING AND LEARNING THROUGH LESSON STUDY WITH COOPERATIVE LEARNING JIGSAW MODE	1-3
Agus Hasan Bashari	IMPROVING LEARNING QUALITY THROUGH IMPLEMENTING THE CONCEPT BY IBN ABDIL BARR	4-10
Ardyanto Tanjung	IMPROVING THE QUALITY OF LEARNING THROUGH LESSON STUDY (CASE STUDY IN GEOGRAPHY ENVIRONMENT SUBJECT)	11-15
Avia Riza Dwi Kurnia, Muslimin Ibrahim, Wahono Widodo	REFLEKSI DAN EVALUASI KEMAMPUAN MAHASISWA CALON GURU BIOLOGI MEMAHAMI MATERI FISIKA SMP	16-23
Baiq Fatmawati	PROJECT BASED LEARNING TO TRAIN CREATIVITY STUDENTS IN DESIGNING PRODUCTS ORGANIC AND INORGANIC WASTE THROUGH LESSON STUDY (BIOLOGY COURSE)	24-30
Denik Pradiantiwi, Rima Wulan Safitri, Pinkan Amita Tri P.	CHARACTER EDUCATION FOR PRISONERS SOFT SKILLS TO EMPOWER THROUGH <i>ASINAN TRASI</i> IN THE CORRECTIONAL INSTUTION NGAWI	31-35
Dies Nurhayati, Ayu Maya Damayanti	POLA REFLEKSI YANG EFEKTIF DALAM <i>LESSON STUDY</i>	36-43
Dwi Setyawan	PENERAPAN MODEL PEMBELAJARAN INQUIRI BERBASIS <i>LESSON STUDY</i> UNTUK MENINGKATKAN KEMAMPUAN BERFIKIR KRITIS DAN HASIL BELAJAR PADA MATAKULIAH PENGETAHUAN LINGKUNGAN PROGRAM STUDI PENDIDIKAN BIOLOGI UNIVERSITAS MUHAMMADIYAH MALANG. <i>The Application of Inquiri Learning Model based on Lesson Study to Improve Student's Critical Thinking Ability and Learning Result on Subjects Knowledge Environment Departmen Biology Education University of Muhammadiyah Malang</i>	44-50

**PROJECT BASED LEARNING TO TRAIN CREATIVITY STUDENTS
IN DESIGNING PRODUCTS ORGANIC AND INORGANIC WASTE
THROUGH LESSON STUDY (BIOLOGY COURSE)**

Baiq Fatmawati

Biology Education Program STKIP Hamzanwadi – Selong

e-mail: *f_baiq@yahoo.com*

Abstract: A Learning biology aims for provides a knowledge to understand the concepts of biology and also to provided supplies for students to be able use the scientific method grounded based on a scientific attitude to solve problems in reality, so the students more aware of the greatness and power of the creator. The Students in learning process is not enough just to master the theories acquired during in the course, but also willing and able to apply for a role-as well as solve problems encountered in daily life and social life. Therefore, we need a learning methods to facilitate, this is project-based learning. This learning centered on student learning and integrated with practice and real-world issues, have great potential to make a learning experience more interesting and meaningful for learners, and learners become active in their learning. The Learning using the issue as a first step in learning, finding and collecting data and information from multiple sources to solve problems and integrate the student's knowledge, make decisions on a wide range of alternative solutions to problems, and activity significantly to produce products with high creativity. The partisipan in this research is students in first semester school year 2025/2016 biology education program STKIP Hamzanwadi Selong (N = 24). A result of observations during in learning process, that is created design project make by students is impersonal and and some modified, in making of products needed another idea to apply design project has been created. The conclusion that the necessary guidance repeated in preparing the design project and making of organic and inorganic waste.

Key word: *project based learning, design project, organic and inorganic waste*

1. INTRODUCTION

To preparing qualified human resources its means empowering the whole person, which is the physical aspect and the way of thinking. The young generation of Indonesia need prepared to entering of free competition in era globalization. They should critically and awareness the importance of a importance of preserving the environmental functions for next generations in managing natural resources (Rustaman, 2000). The college as a place to prepare students become ingenious and qualified human, should be introduced about life skills. To introduction of life skills does not mean changing the curriculum developed or adjustments but reorienting existing curricula to reflect the values of real life. A learning oriented life skills giving new situation in learning, because after completion of the course students have life skills that can be used to solve problems life by using various facilities in their surrounding. By providing life skills to students, at least the students have the confidence to overcome the problems that happened in his life.

Education aims to educate the nation's children and squire them to understand their environment and manage it well. Thus, a concept given in learning process should be tune with the progress of science and technology. Therefore, the collage should be give provide a provisions in form of skills so that they can manage and utilize natural resources in the surrounding areas, one of them by applying learning strategies that can train a creative thinking of students through lectures. One of the strategies learning in education is project-based learning. Project-based learning is pedagogically structured, involves students in learning knowledge and skills through the process of finding or extracting (inquiry) using questions authentic, makes products ranging from planning, designing, make a product, and reflect on the creation of products so that the students experienced interesting learning and meaningful (Gaer, 1998; Doppelt, 2005; Higher Education 2008).

To be meaningful, the learning process used starting from challenging questions about the phenomenon, then assigns students to perform an activity, focusing on the collection and use of evidence, not just deliver information directly and emphasis on rote (Lawson, 1995; Ministry of National Education, 2002). Project-based learning allows students to broaden the knowledge of a particular subject. a knowledge gained more meaningful and learning activities become more interesting, because knowledge is beneficial for him to better appreciate the environment, to better understand and solve a problems encountered in real life. The ability to design projects is learning that supplying students to designing a project in Handling of Waste Organic and Inorganic content, through project-based learning that begins the real question and relevant to everyday life, students identify and find own a problems by making observations in the surrounding environment, making the project design after getting a solution of the chosen alternative solutions in project implementation.

One of the real phenomenon is easily observed by the students associated with environmental learning material is about environmental pollution caused by the waste both organic and inorganic, that is result of human activities. In this case, the need for handling and takes a creativity in reusing the waste so that it can produce a product that has economic value. Based on the description, the question of this research is whether to implement the project-based learning, students can design products from organic and inorganic waste?

2. RESEARCH METHODOLOGY

This research use a descriptive statistics, that is describe or giving an overview toward of the object to be studied through a data sample or population as is, without analyzing and making conclusions apply to the public (Sugiyono, 2011). The participant involved 24 students in the first semester of biology education STKIP Hamzanwadi - Selong which follows the Biology course and divide into six group, each group consist of four student. The instrument in this research is worksheets activity, a worksheets activity done outside course (conditioned), with the intention to monitor the work of students, and guiding all groups to make a design. The following forms of worksheets activity that is used in learning.

Make a product from various types of waste

Direction

1. Read a information in this worksheet activity
2. Discussion and work with your group
3. Create a project design about your activity
4. Make a product suitable your design

A. Content

The organic and in organic waste

Generally, the waste is residue, effluent or sewage generated from everyday human activities, production activities, agriculture and factories. Waste is also an ingredient that is meaningless and worthless. Waste contained in the environment around us can be categorized into several types, all kinds of waste including is organic and inorganic waste. Organic waste is waste that easily decomposes through natural processes. Biodegradable organic waste because it is composed of organic materials. Organic waste derived from plants and animals. Examples of organic wastes are vegetables, trees, leaves, manure, and others. For the processing of organic waste, is relatively easier compared to inorganic waste handling. Organic waste can also be utilized, such as compost and biogas made. Inorganic waste is garbage that can not be treated in soil, an example of inorganic waste is plastic and bottles. However, inorganic waste can be recovered through the recycling process. Inorganic waste recycling can be done in several ways, namely is combustion, destruction, and was buried in the soil. Inorganic waste is burned is a way to reduce volume of waste. A disadvantage this method produces a residue combustion fume, which would result in air pollution. As for the manner of garbage destruction

cut into small pieces, and then recycled into new items. For example, plastics are recycled into plastic stuff new again. Garbage is handled in a manner buried in the ground, just a way of leveling the volume of waste.

B. TASK

1. Choose one kind of organic and inorganic waste that exists around you.
2. The types of waste that you choose, in what way the waste can be processed into useful products for life (create three types of products).
3. Based on your choice at number 2, create a design of recycling waste products. The contents of the draft include:
 - a. Title design
 - b. a problem
 - c. alternative solutions a problems
 - d. Tools and materials used
 - e. work steps making product (compiled systematically)

Each group not be the same a title design in making the product.

Tabel 1. The instrument for asesment design project

Aspek	Indicator	Score	Group					
			1	2	3	4	5	6
State a problem	The problem is not relevant	1						
	The problem is relevant but not original/generally	2						
	The problem is relevant, but fails to show the authenticity of a high/modification	3						
	The problem is relevant and show a high level of authenticity	4						
Alternative a solution	Mention a solution does not match with a problems and objectives	1						
	Mention the solution correctly but only combine existng ideas	2						
	Mention the solution correctly; showing modification of existing ideas	3						
	Mention the solution correctly; showing the products that areactually new (original and unexpected)	4						
Arrange a step of work	Explaining work stepsbut no systematic	1						
	Explaining work steps a systematic, but less clear	2						
	Explaining work steps a systematic, but less clear (do not use scientific language)	3						
	Explaining work steps a very systematic and clear	4						

3. FINDING AND DISCUSSION

Designing a Project; the process of designing done in the classroom with the intention to facilitate in guiding students to do the student worksheet. Result of observations during designing activities, students still do not understand systematically how to create a design as how to express the problem, submit an alternative solution, and how to write the workings (using a phrase that is not scientific). Having explained in more depth, the students already understand how to make the design project, but apart from that all students need guidance and consulting design project not one time. Base on results design project, is seen that students create a draft of a general and modification. Here are the results in the group design process waste (presented in chart 1).

The components in design modified from Doppelt and Starko (2005) namely (a) Problem: students identify problems and ask questions in project design, (b) Objective: students establish an objective based on state a problem, (c) Alternative solution: student conduct investigation by finding answers from variety resources to solve problem so getting a variety of alternative solutions, after that students considering various solutions obtained without influence of external factors, students choose a solution of state alternative solutions. By this strategy, creative ideas expected emerge that has not been previously disclosed, (d) Steps implementation/way of working: students constructing a plan of implementation in accordance with a solution chosen, from the content of draft can be seen whether students show creative ideas in making a design of product. Make a product; make a products based on results of design is conditioned as well, the groups make their products in the biology laboratory.

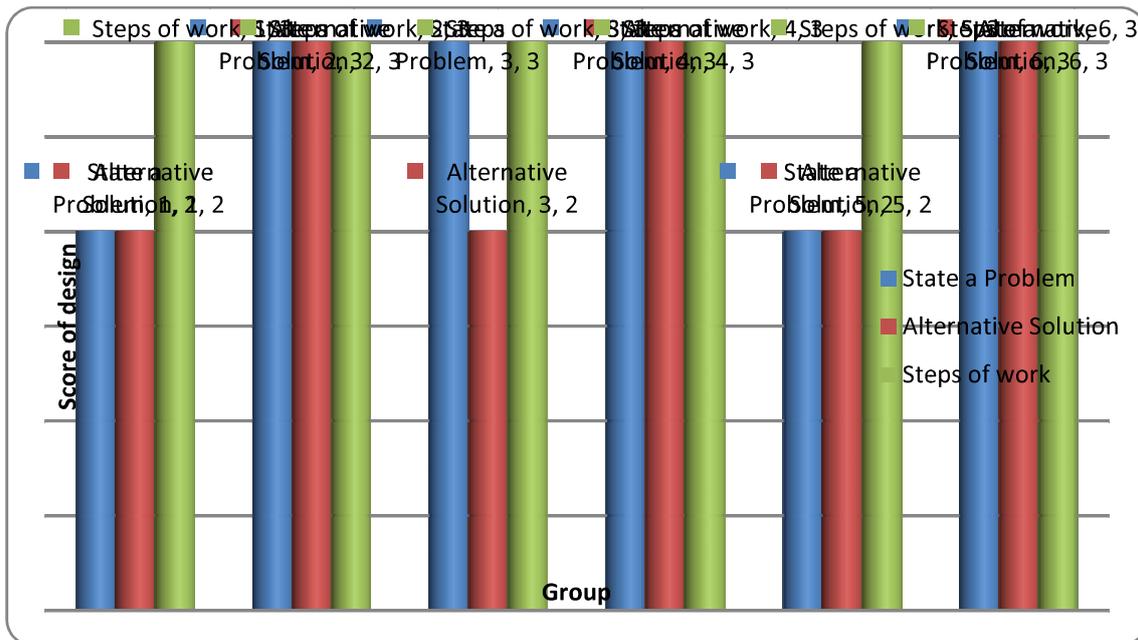


Figure 1. Results of scoring student project design

During the activity, several groups seen confusion in applying the design, making products made repeatedly because it does not correspond with the work which they construct, as in a group of six. A group of six keeps repeating create a winding newspapers, made the basket to form a pattern of pencil. A groups of four kept repeating to attach the pattern a home. Project work can be seen as a form of open-ended contextual activity based learning and that is a part of the learning process that gives a strong emphasis on problem solving as a collaborative effort undertaken in the learning process in a given period (Hung & Wong, 2000).

Creativity can be seen from the results of modification product, or create an original product that has never existed before. Creativity is an effort to make things work with the meaning and means or make something better. Before making anything better, lecturer can assign students to create designs product in advance with fill components design that is the problem, a solution, objectives and ways of working (Starko, 2005). To produce a product creatively, formerly designed it in such a way, not necessarily directly make but need to think about how to make. Therefore, the observation needs to be done for produced products in accordance with a design that has been made.

Based on observation it can be concluded that the creative ideas will continue to evolve as the process is done, the result is also supported by the research findings Fatmawati (2014) which states that the draft made by each group to draft fermentation products are reflected three times (3x) for some components of design, so it can be concluded students' ability in designing the fermented product needed guidance from the instructor. Exercising creativity can be done through constructive learning; one of them

is project based learning. This learning emphasis on learning a relatively long duration, students centered and integrated with practice and real-world issues.

Project-based learning has tremendous potential to make the learning experience more interesting and meaningful to learners, and learners become active in their learning. The teacher's role in project-based learning is as a companion, facilitator and understand of mind the learner (BIE 2007; Asiska, 2008). Project-based learning is learning to use the problem as an initial step in learning, finding and collecting data and information from various sources to solve a problem and integrate the student's knowledge, make decisions on a wide range of alternative solutions to problems, and move significantly to produce products with high creativity.

Step of learning in projectbased learning as developed by The George Lucas Educational Foundation (2005) consists of: (a) **start with the essential question**; Learning begins with the essential question which is questions that can give students assignments to perform an activity. b) **Design a plan for the project**; Planning is about the rules, the selection of activities that can support in answering the essential question, by integrating a variety of subjects as possible, and to know the tools and materials that can be accessed to assist the completion of the project (problem, alternative solutions, and work ways of working). c) **Create a schedule**; teachers and students collaboratively construct a schedule of events in completing the project. Activities in this stage include: (1) create a timeline for completing the project, (2) make the deadline completion of the project, (3) direct students to plan a new way, (4) guiding students as they make way not associated with the project, and (5) require the student to make an explanation (reason) about selection of a way. d) **Monitor the students and the progress of the project**; teachers responsible for conducting monitoring of activities student for completing the project. e) **assess the outcome**; assessment is done to assist teachers in measuring the achievement of standards, role in evaluating the progress of each student, giving feedback on the level of understanding that has been reached students, assist teachers in preparing subsequent learning strategies, and f) **Evaluate the experience**; at the end of learning process, teachers and students reflect on activities and results of projects already executed.

A teacher who masters the capabilities required to develop children's creativity in learning process because the ability of such creativity can be generated and developed through a learning process in the classroom. A person is said to be creative if able; 1) showed a lot of answers a problem, 2) provide a variety of solutions, 3) observations with no glued to a book or searching on internet and find to the field or looking directly to the source, 4) change something that is not helpful to be something that has added value, 5) combining the existing products. The five points were done in a different way, through a plan and a design that is full of creative ideas that exist within learners.

After learning completed, lecture give a quistionare to student for knowing information about their experience in learning process with lesson study system, following the result of the quistionare.

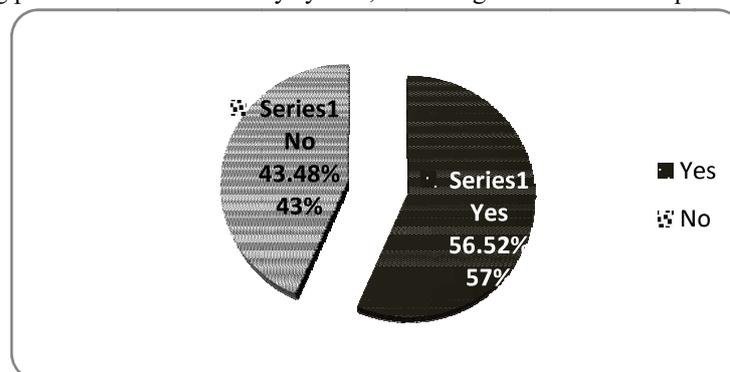


Figure 3: The response of students with lesson study system

A lesson study system get a positive response from all students, they are not nervous although observer seeing all of them in learning, more motivated to follow lectures, the quantitative results are presented in graph 3. Communication between them more active and aggressive in sense that they are

corrected opinion when forward the discussion results. Students more reticent to talk with other friends in the classroom.

Lesson Study is a systematic process that is used by teachers in Japan to test the effectiveness teaching in order to improve learning outcomes (Garfield, 2006). Lesson study is a model professional founding for educators through assessments and ongoing collaborative learning based on the principles of collegiality and mutual learning to build a learning community (Hendayana, 2007; Ibrahim, 2013).

Implementing Lesson Study in learning, will be able provide an opportunity for lecture to learning how to learn and learn about teaching. Suratno (2009) stated that the implementation Lesson study is believed to improve the basic knowledge in learning, improving the professionalism of educators, and build a learning community. The same is expressed by Copriady (2013) that the expansion of the learning process through the implementation Lesson study can be used as a professional development program. Perry and Lewis (2008) suggest the implementation of lesson study as a learning problem-solving solution, because the lesson study can facilitate whatever method is used (Lewis, 2002). A model founding lesson study can be used as a model for teaching founding for lecture toward students (Rustono, 2008). Lecturers need to think about lesson study as a way to improve the quality of teaching and improvement of learning process for students (Yoshida, 2012). Each lecture have advantages and disadvantages, there is no perfect learning process, so that lecturers must learn in order to teach better.

4. CONCLUSION

Project-based learning through lesson study have an impact on process of teaching and learning activities, all processes in the learning stages observed clearly beginning to the end, its mean that the activities previously carried out outside of school hours can be conditioned and all groups facilitated. However, students in process designing the necessary guidance be repeated to get a good project design, presentable, structured and systematic, and scientific. In making a product, be required another idea to apply the project design has been created.

Acknowledgment

Thank you for your cooperation for the students of biology education force in the first half of 2015/2016, you guys are so cooperative, passion and tremendous motivation. Thanks also to my students (Baiq Miftahul Jannah, Mohammed Yusron, Ismul Hadi, Zainul Yuspiadi, Rian Sumantri, Novia Citra Hazrin, Sriva Farhiza, and Nurhidayati) who have helped make a instructional media for needs of this lesson study.

5. REFERENCE

- Asiska. (2008) . *Belajar Berbasis Proyek*. [On Line]. Tersedia di <http://tpers.net>. [16 Juli 2009].
- Buck Institut of Education (BIE). (2007). What Is Project Based Learning?. [On Line]. Tersedia di [http://www.bie.org/index.php/site/pjbl/pjbl handbook/](http://www.bie.org/index.php/site/pjbl/pjbl%20handbook/) [28 Februari 2010].
- Copriady, Jimmi. (2013). The Implementation Of Lesson Study Programme For Developing Professionalism In Teaching Profession. Published by Canadian Center of Science and Education. *Asian Social Science*. 9 (12): 176-186.
- Depdiknas. (2002). *Kurikulum Berbasis Kompetensi*. Jakarta: Puskur Balitbang Depdiknas.
- Direktorat Akademik Direktorat Jenderal Pendidikan Tinggi Jakarta. (2008). Buku Panduan Pengembangan Kurikulum Berbasis Kompetensi Pendidikan Tinggi (Sebuah Alternatif Penyusunan Kurikulum); Sub Direktorat KPS (Kurikulum dan Program Studi).
- Doppelt, Y. 2005. *Assessment of Project-Based Learning in a Mechatronics Context*. Journal of Technology Education Volume 16 Number 2. [On Line]. Tersedia:<http://scholar.lib.vt.edu/ejournals/JTE>. [30 Mei 2009].
- Fatmawati, B. (2014). Penggunaan Lembar Kerja Mahasiswa Berbasis Proyek Terhadap Kemampuan Merancang Produk Fermentasi. "Makalah disajikan dalam Seminar Nasional XI Pendidikan

- Biologi FKIP UNS Biologi, Sains, Lingkungan, dan Pembelajarannya”. FKIP UNS – Surakarta. 7 Juni 2014.
- Gaer, S. (1998). What is Project-Based Learning?. [On Line]. Tersedia: <http://members.aol.com/CulebraMom/pblprt.html>.
- Garfield, J. (2006). Exploring the Impact of Lesson Study on Developing Effective Statistics Curriculum. (Online): www.stat.auckland.ac.nz/-iase/publication/-11/Garfield.doc. diakses <http://www.stat.auckland.ac.nz/-iase/publication/-11/Garfield.doc>. tanggal 19-6-2006
- Hendayana, S., dkk. (2007). Studi Peran IMSTEP Dalam Penguatan Program Pendidikan Guru MIPA Di Indonesia. *Educationist*. Vol 1 (1): 28-38.
- Hung, D.W., & Wong, A.F.L. (2000). Activity Theory as a Framework for Project Work in Learning Environment. *Educational Technology*. 40 (2), 33-37.
- Ibrohim. (2013). Implementasi *Lesson Study* Untuk Meningkatkan Kompetensi Pendidik, Kualitas Pembelajaran di Sekolah dan LPTK Serta Perkembangannya di Indonesia. Makalah disajikan dalam Workshop Sosialisasi Lesson Study Program LEDIPSTI Sekolah Tinggi Keguruan dan Ilmu Pendidikan Hamzanwadi Selong, 19-20 April 2013.
- Lawson, A.E. (1995). *Science Teaching and The Development of Thinking*. Wadsworth: California.
- Lewis, C. (2002). *Lesson study: A handbook for teacher-led improvement of instruction (Brief guide to lesson study)*. Philadelphia: Research for better schools. Online. www.lessonresearch.net/briefguide.pdf.
- Perry, R & Lewis, C. 2008. What Is Successful Adaption Of Lesson Study In The US?. *J. Educ Change*. (10): 365-391.
- Rustaman, N.Y. (2000). Arah Pendidikan Biologi Pra-Universitas di Indonesia. “Makalah disajikan pada Simposium Biologi dalam Seminar Nasional Biologi XVI dan Kongres Nasional Perhimpunan Biologi Indonesia XU”. Seminar Nasional Biologi Xvi Kongres Nasional Perhimpunan Biologi Indonesia. Institut Teknologi Bandung, Bandung, 25-27 Juli 2000.
- Rustono, W. S. (2008). Meningkatkan Kemampuan Mahasiswa Menerapkan Strategi Pembelajaran Melalui Lesson Study Di Sekolah Dasar. *Jurnal pendidikan dasar*. (10):1-7.
- Starko, A.J. (2005). *Creativity in the Classroom: Schools of Curious Delight*, Third edition. New Jersey: Lawrence Erlbaum Associates, Inc., Publishers.
- Sugiyono. (2011). *Metode Penelitian Pendidikan (Pendekatan Kuantitatif, Kualitatif, dan R & D)*. Bandung: Alfabeta Bandung.
- Suratno, T. (2009). *Toward a Fruition of Lesson Study in Indonesia: The case of technical cooperation between Faculty of Mathematics and Science Education (FOMASE) UPI and Japan International Cooperation Agency (JICA) I*. Proposed to the Committee of International Symposium the Launching of Center for Research on International Cooperation in Educational Development (CRICED) Indonesia University of Education (UPI). New Paradigm of Education for Improving the Quality of Life. Bandung, August 18-20, 2009.
- The George Lucas Educational Foundation. (2005). *Instructional Module Project Based Learning*. [On Line]. Tersedia: <http://www.edutopia.org/modules/PBL/whatpbl.php>. [10 Juli 2007].
- Yoshida, M. (2012). Mathematics lesson study in the United States: Current status and ideas for conducting high quality and effective study. *International Journal For Lesson And Learning Studies*. 1 (2): 140-152.