Good Practices in Education
Across Disciplines and Grade-Levels

PROCEEDING
INTERNATIONAL SEMINAR

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Chairman Welcome Note

Welcome to Jember, a fast-growing city in the eastern part of Java. Jember is located around 200 kilometers from Surabaya. For the seminar participants coming from other provinces or other countries, the distance seems far because of the time needed to transport you from Surabaya to Jember by land transportation. On this occasion, I would like to express my thanks to all of you for your visit to the Faculty of Teacher Training and Education, the University of Jember for joining the international seminar.

The international seminar with the central theme *"Good Practices in Education across Disciplines and Grade-Levels"* has been one of the meeting agenda of the Indonesia's Communication Forum of Deans of State Faculty of Teacher Training and Education. This seminar aims to explore good practices in education to be shared, such as good practice in curriculum development, character education, school-based management, social and exact science education, and good practice in the language and arts education. Thank God, for about one-month period of calling for papers, writers of different backgrounds from different parts of Indonesia have given good responses by sending their papers. On behalf of the committee, I would like to extend my gratitudes to individuals, institutions, and schools that have made contributions to the success of this international seminar either as presenters or participants. This certainly has helped us a lot to process the completion of the seminar proceedings.

On this fine occasion, I would like to express my deepest thanks and appreciations to Prof. Dr. H.M. Furqon Hidayatullah, M.Pd., the chairman of the Indonesia's Communication Forum of FKIP Deans, who is also ready to be one of the keynote speakers in this seminar. To my colleages, Prof. Muhammad Haji Salleh, Ph.D. from Malaysia as well as Christopher Allen Woodrich from Canada, I also would like to express my sincerest thanks and appreciations for their readiness to share their thoughts and experiences about the education systems from different perspectives. Hopefully, they could inspire us for the betterment of our education in our beloved country.

The success of this seminar is also supported by the leaders of the univerisy of Jember. Therefore, I would like to thank the Rector of the Univeristy of Jember who always supports and encourages us for the betterment of academic atmosphere through Tri-dharma activities. In addition, I would like to thank the dean and the vice deans of FKIP UNEJ for their continuous supports for the success of this international seminar. Lastly, my thanks also go to the organizing committe of the international seminar who have worked hard and hand in hand for the success of this international seminar.

Realizing that organizing the international seminar is not an easy job, on behalf of the committee members, I would like to ask for apologies for any inconvenience that might be encountered during the seminar. Have a nice seminar and enjoy your stay in Jember.

Dr. Budi Setyono, M.A.
Committee chairman

DAFTAR ISI

EFFECTIVENESS MODEL PROBLEM BASED LEARNING (PBL) BASED ON AUTHENTIC TASK-ORIENTED COLLABORATIVE CREATIVITY IN SCIENCE LEARNING

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Abstrak: Pembelajaran Sains dalam kurikulum 2013 lebih dikembangkan sebagai mata pelajaran *integrative science* bukan sebagai pendidikan disiplin ilmu, yaitu sebagai pendidikan berorientasi aplikatif, pengembangan kemampuan berpikir, kemampuan belajar, rasa ingin tahu, dan pengembangan sikap peduli dan bertanggung jawab terhadap lingkungan sosial dan alam. Kenyataan menunjukkan hasil TIMSS 1993-2011 belum sesuai harapan kurikulum 2013, karena belum mampu membentuk manusia Indonesia yang lebih kreatif. Penelitian ini bertujuan mengetahui efektivitas Model *Problem Based Learning (PBL)* menggunakan tugas autentik berorientasi kreativitas kolaborasi *(collaborative creativity)* dalam pembelajaran sains dan dampaknya pada ketrampilan berfikir kreatif. PBL merupakan model pembelajaran berfokus mengembangkan kemampuan berfikir tingkat tinggi dalam situasi berorientasi masalah dan mengintegrasikan pengetahuan baru yang bermakna bagi dirinya sendiri. Inti dari PBL adalah penyajian masalah autentik dan bermakna situasi yang lebih ditekankan pada penggunaan tugas autentik berorientasi kreativitas kolaborasi *(collaborative creativity)*. Hasil analisis menunjukkan bahwa Model PBL menggunakan tugas autentik berorientasi kreativitas kolaborasi *(collaborative creativity)* efektif dan dapat meningkatkan kreativitas siswa dalam pemecahan masalah autentik. Sehingga dapat disimpulkan bahwa Model PBL menggunakan tugas autentik berorientasi kreativitas kolaborasi *(collaborative creativity)* sangat baik untuk melatihkan kreativitas dan efektif dalam pembelajaran Sains karena PBL berfokus pada pemecahan masalah kehidupan nyata yang memerlukan kolaborasi secara kreatif dalam berbagai alternatif solusi.

Kata kunci: PBL, tugas autentik, collaborative creativity, efektivitas, kreativitas

PRELIMINARY

Science is a study to find out about the nature systematically, so that not only the mastery of science knowledge in the form of a collection of facts, concepts or principles, but also a process of discovery. The learning process emphasizes providing direct experience through inquiry to develop competencies in order to explore and understand about scientific nature. (Kemdikbud, 2013: 175). The main role of the teacher is to encourage more

creative learners to observe, question, reason, and communicate what is obtained or discovered after receiving learning materials. Learning Science in the curriculum was developed in 2013 as a more integrative science subjects rather than as educational disciplines, namely as applicative-oriented education, the development of thinking skills, study skills, curiosity, and the development of caring and responsible attitude towards the social and natural environment (Kemdikbud, 2013: 90). Science learning process will be more meaningful if in accordance with Regulation No. 32 Year 2013 on National Education Standards which explains that the learning process should be conducted in an interactive, inspiring, fun, challenging, motivating the students to actively participate and provide enough space for innovation, creativity, and independence according to their talents, interests, and physical and psychological developments.

The fact that the learning of Science in Indonesia has not been in accordance with the curriculum expectations in 2013, as Indonesia has not been able to form a more creative human in the future. The results of the study Trends in International Mathematics and Science Study (TIMSS), a four- year international study conducted by the IEA (International Association for the Evaluation of Educational Achievement) who observed the development of scientific literacy and mathematics in the cognitive domain coverage includes domain knowledge, application, and application in problem situations. The results showed that the average Indonesian student science achievement scores in TIMSS 1999, 2003, and 2007 in a row is 435, 420, and 433. With the scores of students Indonesia ranks 32 out of 38 countries (1999), ranked 37 of 46 countries (2003), and in 2007 the country ranked 35 out of 49 (Effendi, 2010), as well as the results of the TIMSS 2011 study showed a decrease in position 40th of 42 countries, Indonesia's position slightly above Morocco and Ghana, but far behind Thailand, Malaysia, and Palestine (Kompas.com, 2012). The achievement shows the average scores of students Indonesia always below the average score of 500, only reaching the low international benchmark, because it is only able to recognize some basic facts but not creative in communicating and linking the various topics of science, let alone applying concepts in problem solving daily complex and abstract.

Problems of lack of creative thinking skills of students is an obstacle to the government in preparing the "rise of the Indonesian Golden Generation" which was launched on the occasion of National Education Day May 2, 2012 (Nuh, 2012). Therefore, science teachers as one of the spearheads learning process has a major responsibility for the development of creativity in young people to improve the quality of life of the people and the nation in the foreseeable future. (Nuh, 2011). One effort to overcome the problems of

students creative thinking is problem-based learning (PBL) using authentic task-oriented creative collaboration (collaborative creativity) in science learning.

PBL according to the Arend (2012 : 396) is, "its use in promoting higher-level thinking in problem - oriented Situations, Including learning how to learn". PBL student orientation at the beginning of the problem, organize students for learning, self- help and group investigations, developing and presenting the work/show it off, as well as analyzing and evaluating the problem-solving process. Given the learning process is generally carried out in the classroom, then the presentation of authentic problems can use authentic tasks. Authentic task is a task that is given to the students to gather information with the scientific approach, understanding the various phenomena or symptoms and their relationship to each other in depth, as well as linking what is learned to the real world outside of school. Here, teachers and students have the responsibility for what happened. Learners also know what they want to learn, have a flexible time parameters, and responsible (Sonmi and Ja - Ok, 2011).

PBL uses task-oriented creativity authentic collaboration (collaborative creativity) is a realization of a constructivist view of teaching. Vigotsky in Arends (2012) explains that the constructivist theory is the basic foundation emphasizes PBL students conduct investigations in their environment and build meaningful personal knowledge. PBL uses task -oriented creativity authentic collaboration (collaborative creativity) if applied consistently in the classroom can develop problem solving skills, creativity, and confidence (Sonmi and Ja - Ok, 2011). PBL can also help students acquire the skills to think creatively and professionally in dealing with complex problems, interdisciplinary and real problem situations, and be able to cultivate creative ideas to find a solution (Awang and Ramly, 2008). Implementation authentic task -oriented collaborative creativity (collaborative creativity) through PBL makes students trying to find creative endeavors in the form of a blend of skills, temperament, and business personalities sometimes to realize a shared vision of something new and useful. (Litleton , 2007:763).

Based on the description above, it can be formulated problem: how effective Implementation Model of Problem Based Learning (PBL) using authentic task-oriented creative collaboration (collaborative creativity) in science learning? how students' creativity through Implementation Model of Problem Based Learning (PBL) using authentic task-oriented collaborative creativity (collaborative creativity) in science learning?

LITERATURE

Learning Science in Curriculum 2013

Science or Natural Sciences (IPA) is a scientific knowledge, ie knowledge that has undergone the test of truth through the scientific method,

with the objective characteristic, methodical, systematic, universal, and tentative. Learning science is expected to be a vehicle for students to learn about themselves and the environment, as well as prospects for further development in applying them in everyday life. Learning science oriented applicative capability, the development of thinking skills, study skills, curiosity, and the development of caring and responsible attitude towards the social and natural environment. IPA is also aimed at the introduction of the biology and the surrounding natural environment, as well as the introduction of the various advantages of the archipelago. The learning process emphasizes providing direct experience to develop competence in order to explore and understand about scientific nature. Learning science and the inquiry is directed to do so can help students to gain a deeper understanding of the nature around (Kemdikbud , 2013).

Learning science to junior high school is expected to achieve competency standards expected curriculum in 2013 as follows:

Table 1. Competency SMP / MTS on Curriculum 2013

Dimension	Qualifications Capabilities
Attitude	Has a behavior that reflects the attitude of the faithful, noble, knowledgeable, confident, and responsible in interacting effectively with the social and natural environment in a range of socially and presence.
Knowledge	Have factual knowledge, conceptual, and procedural knowledge in science, technology, art, and culture with insight into humanity, national, state, and civilization-related phenomena and events that seem eye
Skills	Have the ability to think and follow an effective and creative in the realm of the abstract and concrete according to the learned in schools and other similar sources.

(Permendikbud No 54 tahun 2013)

The table above shows that learning science today is expected to increase overall student competence includes the attitudes, knowledge, and skills. Learning science is able to encourage the students, be able to better observe, question, reason, and communicate (present), what is obtained or discovered after the student receives learning materials. Students are prepared ultimately achieve the goal of 2013 that the curriculum be complete Indonesian human who has the ability to live as a private citizen and a believer, productive, creative, innovative, and affective and able to contribute to society, nation, state, and world civilization (Permendikbud No. 68 in 2013).

Problem Based Learning (PBL)

Problem Based Learning (PBL) according to Arends (2012: 396), "its use in promoting higher-level thinking in problem-oriented Situations, Including learning how to learn". Sudrajat (2011) explains that PBL is a learning model that is based on the principle of using problems as a starting point for the acquisition and integration of new knowledge. So PBL is a learning model that implements a high-level thinking ability in problem-oriented situations and integrate new knowledge that is meaningful for himself. Learning is based on the realization of the problem is a constructivist view of teaching. This lesson aims to help students become autonomous learners who have faith in his own ability to solve problems and construct meaning for themselves. The role of the teacher is to guide students to develop attitudes, skills necessary for independent learning, curiosity, creativity, confidence, and initiative.

Arend (2012) describes some of the basic theory underlying the specific PBL as follows : (1) Dewey, depicts a view of education where schools should reflect the larger society and the class is a real-life laboratory for investigation and problem solving. Teachers should engage students in problem -oriented projects and help them investigate the social and intellectual issues that are important, (2) Piaget and Vygotsky instrumental in developing the concept of constructivism, Piaget asserted that children are curious and will continuously strive to understand the world around it, this curiosity motivates them to actively construct representations in the mind of the natural environment. Piaget's theory focuses on the stages of intellectual development based on age. Vygotsky believed that children's growth is influenced by the strength of the biological and social forces (culture). Social interaction with others spur the development of new ideas and improve the intellectual development of students. The main idea Vygotsky social aspects of learning is the concept of the zone of proximal development, (3) Bruner emphasizes the importance of learning through problem solving and scaffolding as a process in which a student is assisted to master a particular problem in the outer or capacity development through assistance (scaffolding) of a teacher or someone more perfect. The teacher uses problem-based learning emphasizes active student engagement, discovery or inductive construction rather than deductive orientation, and knowledge of their own students.

Special features of PBL are: (1) the filing of a problem or question, posed problems must meet five criteria, namely: (a) authentic, real experience problems associated with students, (b) the problem is not clear, so it raises a question mark and some alternative answers of students, (c) meaningful for students, according to their intellectual development, (d) is quite broad, so as to provide an opportunity for teachers to meet their instructional goals, and (e) is

useful for students, (2) focusing on the linkages between disciplines, a problem posed in a problem -based learning should be linked or involve multiple disciplines, so as to produce multiple answers, (3) the investigation of authentic, authentic student investigations to find solutions to real problems. Students must analyze and define problems , develop hypotheses and make predictions, collect and analyze information, conduct experiments (when needed), make inferences, and draw a conclusion, (4) produce real work and show it off, students produce a product in the form of real work represents solving problems are found. Products could include reports, physical models, videos, and computer programs. The students ' work is displayed in front of his friends, and (5) collaboration, students work together with other students, often in pairs or small groups. (Arends, 2012).

Problem Based Learning (PBL) using Authentic Task-Oriented Collaborative Creativity in Learning Science

Problem Based Learning (PBL) is a pedagogical approach to total education that is focused on helping students develop the skills of self-teaching. PBL provides students with the opportunity to gain theoretical and content knowledge and understanding (Awang and Ramly, 2008). PBL meets Four Essential Rules Of The 21st Century Learning developed by Nicholas (2013) consists of (1) instruction should be student-centered, (2) education should be collaborative, (3) learning should have a context, and (4) schools should be integrated with society. Principles of Learning should have a context similar to the one characteristic of PBL which presents problems in authentic learning (Arends, 2012). Learning is not very meaningful for students if no impact on their lives outside of school. Therefore, the subject matter need to be linked with the daily life of students. Teachers develop a learning method that allows students to connect with the real world (real word), helping students find value, meaning and belief in what is being learned, and can apply in their daily lives (Nicholas, 2013) .

Given, problems in daily life is always evolving in the direction of advancement of information technology and the learning process by using PBL also demanded changes include authentic problem representation can be integrated with technology. Authentic problems today can be attributed to examine the conditions in which the working group on creative tasks lead to new competence, effectiveness, solutions, etc. (Grossen, 2008).

Therefore, the presentation of authentic problems in the PBL using authentic task -oriented collaborative creativity that is the task of defining discourse as context - bound activity, which is suitable to be applied in any learning situation and any duty to capture collaboration and creativity as a configuration that is as comprehensive phenomenon in learning. So working

with creative tasks, demanding them to understand each other and show that every task impose constraints on the subject of the action and discourse. As a result, task characteristics play a central role in the interactional dynamics and organization of group work (Grossen, 2008). Applying authentic task -oriented collaborative creativity in making learning more unstructured problems. Students are allowed to feel the real-world problem solving using authentic task -oriented collaborative creativity in the same way that scientists do. A variety of authentic task -oriented collaborative creativity that will be used must be effective and efficient in supporting the learning process. Given that most of the learning process implemented in the classroom, then a variety of authentic task -oriented collaborative creativity related to the subject matter can be done by providing a new discovery -related tasks to be carried out together in a group with a common goal.

Authentic Task -oriented Collaborative Creativity may exist in various forms in the form of creative tasks that implementation focused on the activities carried out in a collaborative environment. Eteläpelto & Lahti suggests that teacher expertise is sensitive, thoughtful pedagogy, has an important role to play in maintaining productive collaborative creativity from time to time. For teachers, finding ways to recognize the differences between people while also building trust is one of a number of tensions they identify. For teachers, develop creativity in the classroom must find a way to allow creativity to productive collaboration possible. Initiative that seeks to build partnerships between educators and those outside the class can maintain such a possibility, but studies of reflective practice is designed to do is to admit that this does not happen automatically but rather arises from deliberate, as a conscious effort (Chappell, Craft, A., &; Craft, Dillon, & Cochrane, 2008; Galton, 2008) .

RESEARCH METHOD

This research is a quasi- experiment (quasi- experimental) research is conducted in a classroom because it is not possible to perform a random selection of the subject, because the subject has naturally formed in the intact group (naturally formed intact group), as a group of students in one class. Research such as this is referred to as quasi- experimental study (quasi-experimental). So the quasi- experimental study using all subjects in the study group (intact group) for treatment (treatment), instead of using subjects drawn at random. The design of this study using a pretest - posttest, Non - Equivalent Control Group Design to assess the effectiveness of learning to use the model of Problem Based Learning (PBL) using authentic task -oriented creative collaboration (collaborative creativity) and assess the creativity of the students during the learning model of Problem Based Learning (PBL) using authentic

task -oriented collaborative creativity (collaborative creativity) on the learning of Science.

As described above, this study aims to (1) determine the effectiveness of the Implementation Model of Problem Based Learning (PBL) using authentic task -oriented creative collaboration (collaborative creativity) in science learning, (2) determine students' creativity through the Implementation Model of Problem Based Learning (PBL) using authentic task -oriented collaborative creativity (collaborative creativity) in science learning; design for achieving goals (1) by using the formula effectiveness and goals (2), used a qualitative descriptive approach, which describes the creativity of junior high school students to do treatment (treatment) specific . The data required to achieve the objectives (1) and (2) were collected with documentation techniques, observation, and interviews, which were then analyzed qualitatively and quantitatively. Qualitative analysis is used to process the data and information used to process the quantitative analysis of quantitative data. Data and results of this descriptive analysis, then analyzed more critically - creatively and rationally to achieve the goals that were collected by observation, interviews, and questionnaires.

The study population is a class IX student of SMP Negeri Jember Sukorambi. While the study sample was taken purposively based on the characteristics of the school population SMP Featured Sukorambi Jember is a class with a good value judgment. The data obtained in this study is the value of post-test students and observation of student creativity. Analysis of the data to answer the problems and achieve goals (1) do done by using descriptive. The data described through the stages of data analysis which includes the step of data reduction, exposure data, and inference data.

RESULTS AND DISCUSSION

The data were obtained from pretest and the value of data that has been done posttes students. Prettest value data, and the posttest is relevant and accurate material that can be used to address problems in this study. The first problem was answered by testing the effectiveness of using the model of Problem Based Learning (PBL) with an authentic task-oriented creative collaboration (collaborative creativity). While creativity of students tested formula percentage. From the calculation, the effective application of the model PBL generated by task-oriented authentic creative collaboration (collaborative creativity) to improve the effectiveness of learning outcomes physics amounted to 84.76%. This value when viewed in the table are in the category of the effectiveness of interval between $75 \leq \eta \leq 100$, so that its effectiveness is considered very effective.

Based on observations made at the time of learning with PBL using a task-oriented model of creative collaboration (collaborative creativity), the creativity of the students to the PBL model of creative collaboration using task-oriented (collaborative creativity), 82.89% creative in completing tasks in their lessons. This shows that the application of the model using a task-oriented model of PBL collaborative creativity (collaborative creativity), which is done can actually provide benefits that previously the students tend to be passive after learning of students being active and learning outcomes was also increased.

So far, educators tend to think PBL is too difficult to apply and only the bright students. Their opinions are not always true, because the curriculum 2013 requires applicative oriented science learning, the development of thinking skills, study skills, curiosity, and the development of caring and responsible attitude towards the social and natural environment. The learning process emphasizes providing direct experience through inquiry to develop competencies in order to explore and understand the universe around scientifically (Kemdikbud, 2013).

PBL supported by Dewey 's theory that describes a class of real-life laboratory for investigation and problem solving, Piaget's theory of cognitive development, Vigotsky about the influence of the strength of the biological and social forces (culture) to the intellectual growth of the students and the concept of zone of proximal development and Bruner stressed the importance of learning through problem solving and scaffolding (Arends, 2012). In addition, Silver, C. E. H (2013) found that PBL can help students develop the knowledge feksibel problem space that can be used in the investigation, and Mumford, M. D., Medeiros, K. E., and Partlow, P. J (2012) found that creativity in problem solving depends on the implementation of complex cognitive processes that are effective, while effective process depends on the strategies and knowledge used in problem solving. PBL means using authentic task -oriented creative collaboration (collaborative creativity) can be applied to a variety of student characteristics and existing infrastructure taking into account the effectiveness of the strategy adopted in accordance with the teachers provide scaffolding nearest development zone students in problem solving.

PBL in science learning are essentially involves the presentation of authentic and meaningful situations that serve as the foundation for students' investigation and inquiry. Given Science is scientific knowledge, it is the study of science is expected to meet the objective characteristic, methodical, systematic, universal, and tentative (Permendikbud, 2013).

Creative thinking will not be separated from the term creativity, creativity relates to the attitude of someone who is regarded as creative. Creative thinking is the thinking skills that lead to and cope with the demands of the

context of all the ability to find solutions and self-oriented decisions to be implemented (Tilaar, 2012). Creative thinking skills of students can be measured by using Creative Thinking Skills Test Instrument and Creative Thinking observation instruments developed their own or use existing instruments and their validity tested instruments developed eg Gifted.

Various studies related to PBL (Awang and Ramly, 2008; Gallagher and Gallager, 2013; Sonmi and Jo-Ok, 2011; Mumford, et al, 2012; Silver, CEH, 2013) have clearly demonstrated that the PBL through solving authentic tasks can improve creativity of students. Students can create on the task of solving authentic or create on academic potential in finding hidden.

CONCLUSIONS AND RECOMMENDATIONS

Conclusions

Based on the data analysis and discussion that has been described in the previous chapter, it can be concluded as follows.

1. Implementation Model of Problem Based Learning (PBL) using authentic task-oriented creative collaboration (collaborative creativity) is very effective in learning science
2. Creativity of students through Implementation Model of Problem Based Learning (PBL) using authentic task-oriented creative collaboration (collaborative creativity) in science learning, including higher category.

Suggestions

1. Model Problem Based Learning (PBL) using authentic task-oriented creative collaboration (collaborative creativity) is an alternative model could be developed to foster student collaboration capabilities in performing creative tasks.
2. Lesson in creativity-oriented collaboration (collaborative creativity), teachers need to determine the shape of the task as a creative task that obtained the maximum results.

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