Project Based Learning Method To Improve Student's Creative Thinking

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A. Introduction

Learning aims to help students to gain various experiences and with that experience student behavior which includes cognitive, affective, psychomotor and values or norms that function as controllers of student behavior. In the whole process of education in schools, learning is the most important activity to achieve the success of educational goals. Therefore, the learning process that takes place effectively greatly affects the education of students. This requires a teacher's understanding of the way the teacher teaches through an effective and innovative learning model (Titu, 2015).

The learning model is a plan that describes the process of detailing and creating an environmental situation that allows students to interact so that there is development in students in the process used as a guide in planning learning in class or learning in tutorials (Trianto, 2011). As for Soekamto, et al (Nurulwati, 2000) stated the learning model as a conceptual framework that describes a systematic procedure in organizing learning experiences to achieve certain learning goals, and serves as a guide for learning designers and teachers in planning learning activities.

Safitri (2019) suggests that the application of the PjBL Model directs students to carry out projects together with other students into groups to produce the completion of project assignments that can be presented. The final result in project-based learning is a solution to a problem that has been solved together in student group work. Thomas stated PjBL as a learning model that involves focusing on meaningful questions and problems, problem solving, decision making, the process of finding various sources, providing opportunities for members to work collaboratively, and closing with presentations (Safitri, 2019).

Project Based Learning (PjBL) is also a learning model that can be applied to help students develop student creativity. The learning model (PjBL) is one of the solutions that can be applied in Indonesia due to the low development of student creativity in Indonesia. Martin Prosperity Institute states that creativity in Indonesia is still at a low rank, which is ranked 115 out of 139 countries (Florida, 2015). Whereas with creativity this nation can manage natural resources well so that the country's goal of being more prosperous can be achieved.

B. Literature Review

1. Creative Thinking

a. Definition of Creative Thinking

Siswono stated that efforts to improve creative thinking skills mean efforts to increase students' ability scores in understanding problems, fluency, flexibility and novelty in problem solving. Creative itself is defined as a multi-dimensional construct, consisting of a cognitive dimension, an affective dimension, and a psychomotor dimension. The term creativity is often used in life, both in the world of education and in society, for example, creativity is associated with creative products.

James J. Gallagher (Rachmawati and Kurniati, 2012) said that Creativity is a mental process by which an individual creates new ideas or products, or recombines existing ideas and products, in fashion that is novel to him or her. Creativity is the ability based on available data or information to find many possible answers to a problem, where the emphasis is on quantity, effectiveness, and diversity of answers (Susanto, 2011) which are the characteristics possessed by individuals who mark the ability to create something similar. completely new or a combination of existing works (Ali and Asrori, 2011). Creativity is one of the basic human needs for self-actualization, and is the highest need for humans (Maslow in Munandar, 2009). Basically, everyone is born in the world with creative potential. Creativity can be identified and fostered through proper education (Munandar, 2009).

b. Characteristic of Creative Thinking

The characteristics of creativity (Hedriana and Soemarno, 2014) include:

1) The characteristics of originality include: a) being able to produce new and unique expressions; b) able to make unusual combinations of parts or elements; c) think of unusual ways to express oneself.
2) Flexibility characteristics include: a) being able to change the approach or way of thinking. ; b) looking for many alternatives or different directions; c) being able to change the approach or way of thinking, c) generating varied ideas, answers, or questions, being able to see a problem from different perspectives.

3) The characteristics of elaboration include: a) adding or detailing the details of an object, idea, or situation so that it becomes more interesting, b) being able to enrich and develop an idea or product;
4) Fluency characteristics include: a) sparking lots of ideas, lots of answers, lots of problem solving, lots of questions fluently; b) giving multiple ways or suggestions for doing things..

Indicators of creative thinking ability include: 1) Elaborating skills which means one's skills to enrich and develop an idea or product and add or detail the details of an object, idea, or situation so that it becomes more interesting; 2) Original thinking skills which means a person's skill to be able to do new and unique expressions, think of unusual ways to express oneself and be able to make unusual combinations of parts and elements; 3) Flexible thinking skills, namely a person's skills to generate varied ideas, answers or questions, can see a problem from different perspectives and be able to change the approach or way of thinking; and 4) Fluent thinking skills, namely a person's skills to generate many ideas, answers, problem solving or questions, provide many ways or suggestions for doing various things, and always think of more than one answer (Susanto, 2015).

c. Factors Influencing Creative Thinking

Factors that influence student learning creativity (Munandar, 2004) include: (1) the attitude of parents towards children's achievements, where achievement is not a number, so parents should respect their children's achievements so that children can be encouraged to produce good works; (2) Creative children usually have parents who respect them as individuals, believe in their abilities and appreciate the uniqueness of children (3) Appreciate creativity, creative children get encouragement from parents to do creative things. One of the factors that influence children's creativity, namely the attitude of the parents; (4) Parents who believe in giving freedom to their children tend to have creative children. Parents tend to be less authoritarian, do not always want to supervise and they do not limit their children's activities too much; (5) Moderate emotional closeness, children's creativity can be inhibited by an emotional atmosphere that reflects a sense of hostility, rejection and separation.

2. Project Based Learning (PBL)

a. Definition of Project Based Learning (PBL)

Trianto (2011) stated that the project-based learning model gives students the opportunity to make learning experiences more interesting and useful for students (Santyasa, 2006). Project-based learning can thus encourage students to be more active in learning. The teacher only acts as a facilitator, evaluating the students' work products that are displayed in the results of the projects being carried out, so as to produce real products that can encourage students' creativity to be able to think critically in analyzing factors in problem concepts.

Sastrika, Sadia, and Muderawan (2014) state that project-based learning is process-centered learning, relatively time-consuming, problem-focused, meaningful learning units by combining concepts from a number of components, be it knowledge, disciplines or fields. In project-based learning, the learning activities take place collaboratively in heterogeneous groups. Project-based learning has enormous potential to train students' thinking processes that lead to students' critical thinking skills. Critical thinking skills are developed at each stage of the project-based learning model. Students become motivated in their learning, the teacher acts as a mediator and facilitator.

Project-based learning (PjBL) is a learning model that uses problems as the first step in collecting and integrating new knowledge based on experience in real activities. Project-based learning is designed to be used on complex problems that students need to investigate and understand (Herwandi, 2014), and in this learning model, students will work in teams (groups) cooperatively and change mere factual thinking into more critical thinking. and analytical (Faiq, 2015). The learning model is a plan or a pattern that is used as a guide in planning learning in class or learning in tutorials. The PjBL model is an application of active learning. In simple terms project-based learning is defined as a teaching that tries to link technology with everyday life problems that are familiar to students, or with school projects. The project-based learning model or PjBL model is an innovative learning model, and emphasizes contextual learning through complex activities (Wena, 2011).

Project-based learning is a learning model that is oriented to developing students' learning abilities and skills through a series of activities to plan, carry out research, and produce certain products that are framed in one container in the form of a learning project (Ali and Asrori, 2011). The PjBL model is a long-term learning activity that involves students in designing, creating, and displaying products to solve real-world problems (Sani, 2014).

The project-based learning model (Project Based Learning) is one of the learning models that can be used by teachers so that automatically teachers also use a scientific approach in their learning. The scientific approach is a learning approach in which students acquire knowledge based on scientific workings. Through this scientific approach, students will be invited to climb the golden bridge so that they will not only gain knowledge but will also acquire the skills and attitudes needed in their future

lives. When learning to use this project-based learning model, students can practice inductive reasoning (Faiq, 2015)

b. Characteristics of Project Based Learning Model

Project-based learning has several principles that characterize it including: a) The principle of centrality, which means that project work is the essence of the curriculum, which is the center of learning strategies; b) The principle of realistic (realism), namely the project is something real.; c) The principle of constructive investigation is a process that leads to the achievement of goals, which includes activities of inquiry, concept development, and resolution; d) The principle of autonomy can be defined as the independence of students in carrying out the learning process, namely being free to make their own choices, working with minimal supervision, and being responsible; and e) The principle of driving/guiding questions, namely project work that focuses on "questions or problems" that can encourage students to struggle to acquire the main concepts or principles of a particular field (Wena, 2016).

c. Advantages of Project Based Learning

Widyantini (2014) states that the advantages of the PjBL model are to increase student motivation, increase collaboration, improve resource management skills, improve problem solving skills, increase student activity, improve student skills in finding information, provide experience to students in organizing projects, provide experience in make time allocations to complete assignments, encourage students to develop communication skills, make the learning atmosphere fun, and provide learning experiences that involve students in the real world. Dahlan (2015) states the objectives of Project Based Learning include:

1) To develop students' ability in solving project problems
2) To acquire new knowledge and skills in learning
3) To make students more active in solving complex project problems with real product results
4) To improve students' skills in managing materials or tools to complete tasks or projects.

d. The Stages of the Project Based Learning

Project-Based Learning generally consists of three stages, namely: (1) project planning includes identifying real problems, finding alternatives and formulating problem solving strategies, and planning. (2) project implementation includes student guidance in completing assignments, conducting product testing (evaluation), and presentations between groups. (3) project evaluation in the form of process and product assessment which includes project learning progress, the actual process of problem solving, team and individual performance progress, notebooks and research notes, learning contracts, computer use and reflection. Meanwhile, product assessments include work and presentations, non-written assignments, and project reports (Lestari & Yudhanegara, 2015). Furthermore, Herwandi (2014) wrote down the Project-Based Learning steps, namely::

1) Start With the Essential Question
   Learning begins with essential questions, namely questions that can give students assignments in carrying out an activity. Taking topics that are in line with real-world realities and starting with an in-depth investigation. The teacher tries to make the topics raised relevant to the students.
2) Design a Plan for the Project
   Planning is done collaboratively between teachers and students, so students are expected to feel "own" over the project. Planning contains the rules of the game, the selection of activities that can support answering essential questions, by integrating various possible subjects, and knowing the tools and materials that can be accessed to help complete the project..
3) Create a Schedule
   Teachers and students collaboratively schedule activities to complete projects. Activities at this stage include: (1) making a timeline for completing the project, (2) making project completion deadlines, (3) bringing students to plan new ways, (4) guiding students when they make ways that are not related to the project. project, and (5) asking students to make an explanation (reason) about choosing a method.
4) Monitor the Students and the Progress of the Project
   The teacher is responsible for monitoring the activities of students while completing the project. Monitoring is done by facilitating students in each process. Meanwhile, the teacher acts as a mentor for student activities. At this stage, a rubric is also created that can make it easier to record all important activities to simplify the monitoring process.
5) Assess the Outcome
   Assessment is carried out to assist teachers in measuring the achievement of standards, play a role in evaluating the progress of each student, provide feedback on the level of understanding that has been achieved by students, assist teachers in formulating the next learning strategy.
6) Evaluate The Experience
   At the end of the learning process, the teacher and students reflect on the activities and project results that have been carried out. The reflection process is carried out individually or in groups.

At this stage students are asked to express their feelings and experiences while completing the project. Teachers and students develop discussions in order to improve performance during the learning process, so that in the end a new inquiry is found to answer the problems posed in the first stage of learning.

C. Method

The design of this research is Literature Review or literature review. Literature review or literature research is research that examines or critically reviews the knowledge, ideas, or findings contained in the academic-oriented literature, and formulates its theoretical and methodological contributions to certain topics. (Creswell, 2010). Literature study is also defined as a series of activities related to the methods of collecting library data, reading and taking notes and processing research materials (Mestika Zed, 2008).

D. Discussion

Learning is an activity that aims to achieve good learning outcomes. The success of the learning process can be seen from the students' mastery of the material presented by the teacher. Thus, the teacher in conveying a concept cannot be separated from how the teacher conveys the material using a learning model. The selection of the right model will give the impression on students in mastering the concept so that students can easily solve problems related to the use of the concept so that they can think creatively.

Efforts to realize thinking skills in students should be carried out by teachers through the selection of learning models that are able to require students to be able to develop creative thinking skills in learning, and be able to choose learning models that allow students to think. Project-based learning or Project Based Learning (PjBL) is an in-depth investigation of a real-world topic, it will be valuable for the attention and effort of students. With project-based learning or Project Based Learning (PjBL), students get a lesson from their own experience and it will be more meaningful for students. Project-based learning models have enormous potential to make learning experiences more interesting and useful for students (Sagitri, 2019).

Based on the results of research conducted by Safitri (2019), it is known that the results of data analysis are (1) There are differences in the average creative thinking abilities of students who are applied the PjBL model, PBL model and direct learning model, (2) Learning using the PjBL model on thinking skills creative thinking is categorized as quite effective with a moderate classification, (3) learning using the PBL model for creative thinking skills is categorized as quite effective with a moderate classification, (4) learning using direct learning models for creative thinking skills is categorized as quite effective with a moderate classification and (5) there are differences the average creative thinking ability of students who applied the PjBl model, PBL model and direct learning model. The results of Safitri's research are in line with the results of research proposed by Clegg and Bercch (Wena, 2011) that through project work learning, creativity and student motivation will increase.

Project-Based Learning Models can provide opportunities for students to freely conduct experimental activities, review literature in the library, browse the internet, and collaborate with teachers. Thus, students can get more open and varied learning resources, including exploring the environment. This opportunity then has an impact on the formation of motivation in students to study with full sincerity to answer the questions that have been asked.

Wati, Linda (2013) in a study on the Application of Project Based Learning Models to Improve Student Creativity at MAN I Kebumen also stated that the implementation of physics learning through project based learning could increase the creativity of class X.6 students in MAN I Kebumen able to increase the average presentation of observations. essay test questionnaire, and student learning outcomes. Thus, project-based learning has enormous potential to make learning experiences more interesting and meaningful for students. In project-based learning, students are motivated to be more active in their learning, the instructor is behind and students take the initiative, the instructor makes it easy and evaluates the project both its meaning and its application to their daily lives. The products that students create during the project provide results that can be authentically measured by the teacher or instructor in learning**.**

E. Conclusion

Broadly speaking, it can be concluded that the application of the project based learning (PjBL) learning model is one of the learning models that is able to support student creativity. Creativity is the ability to provide new ideas and apply them in problem solving. Creativity includes both aptitude traits such as fluency, flexibility, and originality in thinking, as well as non-aptitude traits, such as curiosity, likes to ask questions and always want to seek new experiences. So that the application of the project-based learning model can be used as an alternative in increasing student creativity in the problem

concept material. For the next teacher, using the project-based learning model, requires the ability to coordinate class and time so that learning can run optimally.

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