Tianjin Daxue Xuebao (Ziran Kexue yu Gongcheng Jishu Ban)/
Journal of Tianjin University Science and Technology
ISSN (Online):0493-2137
E-Publication: Online Open Access
Vol: 55 Issue: 12: 2022
DOI10.17605/OSF.IO/CRBPA

IMPLEMENTATION OF THE PROJECT BASED LEARNING (PJBL) LEARNING MODEL IN INCREASING STUDENT CREATIVITY

(Case Study on Physics Teaching Materials at Sman 2 Majalaya and Sman 1 Cicalengka in Bandung Regency)

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Abstract

The low level of student creativity in learning Physics makes learning less meaningful and will produce graduates who are less competent. This study aims to describe and analyze the application of the Project Based Learning (PjBL) learning model to improve student creativity and teacher managerial abilities, teacher performance and competence. The teacher's efforts in increasing student creativity are through the application of the Project Based Learning learning model which is directed at aspects of the meaningful learning process. Project work contains complex tasks based on problems (problems) given to students as the first step in collecting and integrating new knowledge based on their experience in real activities. Conducted. Students at SMAN 2 Majalaya and SMAN 1 Cicalengka, Bandung Regency. This research is a Classroom Action Research (CAR) which will be conducted in 2 cycles based on the assumption that the Project based learning model provides an alternative authentic learning environment where learners can help facilitate improving skills in work and collaborative problem solving. The project-based learning approach is supported by constructivist learning theory. Using a qualitative research approach. The subjects of the study were students of the IPA class, totaling 35 students. The data analysis technique in this study refers to the analysis technique of the Miles and Huberman model. Data analysis using descriptive analysis. The results showed that the students' achievement in learning physics on the cognitive aspect had increased quite well, from an average of 62.00 to an average of 90.20, where the average learning outcome reached the KKM score (70). The average learning outcomes in the domain of attitudes obtained a very good predicate. While the average student learning outcomes in the skills aspect obtained a value of 82.13. Furthermore, for the creativity test results from the N-gain calculation, 12 students got the highest category, 20 students got the medium category, and 3 students got the low category. Thus, showing students how concepts, principles, science, technology, techniques, are used in an integrated manner to develop products, processes, and systems that are beneficial to human life. Can increase student creativity in learning Physics in the two schools

Keywords: Learning Model, Project Based Learning (PJBL), Student Creativity

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1. INTRODUCTION

Before the millennial era of innovation, creativity belonged to adults, parents, now innovation and creativity arise from young children, this is where the role of adults can guide and guide them to create their creativity so they don't experience difficulties and can keep up with the times. Minister of Education and Culture (Mendikbud) Nadiem Makarim will add two new basic competencies to the 2013 Curriculum. The two competencies are computational logic and compassion which will complement the four pre-existing competencies, namely creativity, critical thinking, collaboration, and communication. Popularly called 4C. This computational logic must later become a culture in learning. Teachers who have strategic abilities in solving problems will instinctively share it in the form of how he initiates in the subject. Computational logic is also not only for mathematics, science. As for compassion, it is a competency that teachers must possess when teaching. Compassion can at the same time build integrity. Creativity is inherent in every human being, but some people can publish it and some people can't bring it up. This can happen because there is no continuity between internal factors and external factors. Creativity is the ability to create new forms, new cognitive structures and new products. However, creativity can also be used as a form of an ability to channel ideas by making something different from the others. Either through combining existing data or information and then making slight changes to the work he makes.

2. REVIEW OF LITERATURE

A teacher is required to have mastery of various abilities as a professional teacher in his field. Whether it's the ability of teachers in teaching methods, mastery of the material, the selection of various teaching methods, the ability to make learning tools/media, attitudes, and examples. Teachers who have an understanding of their competencies will create a conducive and fun learning atmosphere, and encourage students to develop their creativity. So the teacher must be able to mobilize either to become a facilitator, collaborator, mentor, coach, director and study buddy for their students in the learning process.

Project Based Learning (PjBL) is a learning model that provides opportunities for teachers/lecturers to manage learning in the classroom by involving project work. Many learning models are applied to grow and improve the spirit of creativity in students, especially in creating and or making a product or work. One of the learning models that is believed to foster creativity and creative thinking skills of students in designing and making a project is Project Based Learning (PjBL). Project Based Learning is a learning process that directly involves students to produce a project. Basically this learning model develops more solving skills in working on a project that can produce something. In its implementation, this model provides broad opportunities for students to make decisions in choosing topics, conducting research, and completing a particular project.

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Learning Model Project based learning supported by learning theory Constructivism is a theory from Piaget, according to the perspective of constructivism learning theory PjBL is an innovative learning that emphasizes contextual learning through complex activities. Project-based learning or Project Based Learning (PjBL) is a learning designed for complex problems where students investigate to understand it, emphasizing learning with long activities, the tasks given to students are multi-disciplinary, product-oriented. The Project Based learning model also received theoretical support originating from Vygotsky's social constructivism which provided a foundation for cognitive development through increasing the intensity of interpersonal interactions to help the knowledge construction process (meaning making process). The application of the project based learning model in the teaching and learning process gives students the freedom to plan their own learning activities, carry out collaborative projects, and ultimately produce work products that can be presented to others. Project Based Learning learning model can provide opportunities for students to develop all their potential, especially student creativity.

High school physics subjects as part of science subjects in high school which studies the relationship between concepts. The concepts in Physics can be expressed in the language of mathematics but only as a tool to facilitate and simplify the way of expressing Physics. Physics subjects in high school aim to make students able to master the concepts of Physics and their interrelationships and be able to use scientific methods based on a scientific attitude to solve the problems they face. In the study of Physics Education, students are required to play an active, innovative, and have high creativity in learning so that they can become graduates who are ready to work. The problem that occurs in students in both schools is the lack of creativity in learning.

This is evident from interviews with several tutors. With creativity, students can be more active and creative in learning, so that learning can be felt alone and meaningful for students. Therefore, there needs to be a formulation that brings students to a more creative level with less time. Enough, according to the time used for one concept of discussion, in order to achieve the curriculum that has been set, also the use of media and models that are not too difficult can make it easier for students and teachers in carrying out learning.

The learning model in question is a project-based learning (PjBL) model, which is project-based learning, a systematic learning model, involving students in learning complex knowledge and skills, authentic questions, and product and task design. According to the Buck Institute for Education (BIE) in (Ngalimun, 2013: 185) Project Based Learning Model is a learning model that focuses on the main (central) concepts and principles of a discipline, involving students in problem solving activities and tasks - other meaningful tasks, giving students the opportunity to work autonomously to construct their own learning, and ultimately to produce valuable and realistic student work products. The advantage of this learning model is that it provides opportunities for students to be active

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and master the material according to the given project. PjBL learning in general has a step guide: Planning (planning), Creating (creating or implementing), and Processing (processing) the steps of the project based learning learning model are 6 steps.

Steps can be applied by involving children, from different cultural backgrounds because children can choose topics that are related to their own experiences, with various ways of learning according to individual or cultural characteristics (Mahanal, 2009). There are five principles of project-based learning according to Thomas as quoted by Wena (2011, in Isriani, 2012: 128), including: a. The Centralist Principle the centralist principle asserts that project work is the essence of the curriculum. b. The principle of driving questions this principle is an external motivation that is able to inspire independence in teaching learning tasks c. The principle of autonomy is the independence of students in carrying out the learning process. d. Realistic Principle The principle says that the project is something real, not like in school. Based Learning (PjBL) is one model that can be used as an alternative for educators (teachers and lecturers) in managing good learning because the process involves many students actively in developing various basic skills. In this case, students are conditioned in such a way as to be able to think critically, creatively and scientifically from planning, developing, processing until finally producing a product as the realization of learning outcomes.

Methodology The research was carried out at SMAN 2 Majalaya and SMAN 1 Cicalengka, Bandung Regency. This research was in the form of Classroom Action (CAR). The factor studied was the creativity of students' learning in physics by using the project based learning (PjBL) learning model. This research was conducted to apply the project based learning (PjBL) learning model in increasing student creativity in Digital Physics Learning with the PjBL research model. In this Classroom Action Research, the factor studied is the creativity of students' learning by using the project based learning (PjBL) learning model which will include the steps taken such as the preparation phase, the research implementation phase which is divided into cycle I and cycle II.

Each cycle has stages in the form of planning, implementation, observation, and reflection on implementation, observation, and reflection. Using the observation sheet. The data of students who carry out learning creativity is filled in by giving a check mark according to the creativity they do during the learning process. The technique of collecting data is by using test, observation, documentation and project/product assessment techniques. Data analysis using descriptive analysis. While the test method, used to determine student learning outcomes Reflection Planning Cycle I Implementation of Observation Planning Reflection Cycle II Implementation of observations resulted in N-Gain Classification Value g Interpretation g > 0.7 High 0.3 < g 0.7 Medium g 0, 3 Low.

3. RESULTS AND DISCUSSION

The concept of the project based learning (PjBL) learning model is a type of learning designed to increase students' learning creativity in learning. The stages in the learning

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are: planning, implementation, observation and reflection. Learning creativity is obtained through tests and checklists obtained during learning activities. Learning in cycle I was carried out in 3 meetings, with details of 3 meetings of the learning process in Bandung Regency (Cicalengka and Majalaya. meetings for tests. Student creativity in learning in cycle I was observed using the observation sheet that has been submitted in the learning process the researcher observes the student's learning creativity.

The researcher is assisted by other teachers as observers who observe the learning activities carried out by the researcher. Student creativity data Average creativity in cycle I Creativity Indicator Cycle 1 Pert. 1 Pert. 2 Pert. 3 Personal Average of Creative Products 41.07 46.42 64.28 50.59 average 39.50 51.11 63.61 51.40, it can be seen that student learning creativity in the first cycle of creativity observation during the learning process takes place shows that the average creativity in creative individuals is 54.75%, on the p . Indicator ress (encouragement) is 51%, the creative process indicator is 48.50%, while the creative product indicator is 50.59%. Then the average of cycles 1, 2, and 3 after following the learning process using the PjBL learning model. With this test method, student learning completeness is known.

The creativity data analysis technique was analyzed descriptively in the form of percentages. The student learning creativity observation data used percentage analysis with achievements above 80%. Then for the creativity test results using N-gain analysis to find out how much creativity increased.

The results of the gain calculation are then interpreted using the classification from Hake (2001), that student learning creativity in the first cycle of creativity observation during the learning process shows that the average creativity on the creative personal indicator is 54.75%, on the press indicator (push)) is 51%, the creative process indicator is 48.50%, while the creative product indicator is 50.59%. Then the average of cycles 1, 2, and 3 is 60.2, then in cycle 2 has an average of 91, 20% this is because students have started to realize the creativity of learning in map-making activities. Diagram of student creativity level in Student Creativity Level in Learning Cycle I Cycle I Meeting 1 Cycle I Meeting 2 Cycle I Meeting 3 Creative Persons 42.85 55.35 66.07 Press 41.07 51.78 62.5 Creative Process 33.03 50.89 61.6 Creative Products 41.07 46.42 64.2 . After the reflection is held, cycle II is carried out..

The stages in cycle II are the same as in cycle I, which consists of: planning, implementing actions, observing, and reflecting. b. Discussion the problem that occurs in the two high schools studied is the lack of creativity in learning. It is proven from the results of interviews 0 50 100 150 Student Creativity Diagram Each Creative Personal Cycle Press Creative Process Creative Products N-gain Value Category Number of students g > 0.7 High 10 0.3 < g < 70 Medium 16 g 0.3 Low 3 Total 35 Discussion and research results. By emphasizing on learning creativity, it can make students more active and creative in learning, so that when they graduate, they can make a media map. The application of the project-based learning model has an influence on increasing student learning creativity,

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because the project-based learning model has many advantages, among others, it invites students to get more motivated in the learning process, besides that the project-based learning model is able to increase student collaboration. , due to the formation of groups in the learning process, so that it becomes easier to solve problems in project assignments given by the lecturer.

This is in accordance with the opinion of Ngalimun (2013: 197) regarding the advantages of the project based learning model, namely increasing motivation, increasing problem solving abilities, increasing collaboration, improving resource management skills. A similar study from the International Journal by Kuo-Hung Tseng (2013) in Taiwan entitled Attitudes towards science, technology, engineering and mathematics in a project-based learning (PjBL) environment, concluded that "combining PjBL can increase effectiveness, generate meaningful learning and influence student attitudes in future career pursuit. Students are positive towards combining PjBL.

Furthermore, research from Insyasiska et al (2015) entitled the effect of project based learning on learning motivation, creativity, critical thinking skills, and students' cognitive abilities in learning biology. project based learning can affect students' learning motivation higher by 14%, students' creativity increases by 31.1%, critical thinking skills increase by 34% and students' cognitive abilities also increase by 28.9% compared to learning given without going through a project. Students are motivated to work with teams to produce creative ideas which are then realized in a product. In the project stage, these 10 aspects of creativity are very important. Projects that are done in cycle I, students are required to make a map of the instrument. Students together with their groups look for data on the internet. After getting the data, students make the map with the aid of the Arc GIS application. In this first cycle the achievement of student learning creativity has not been maximized because it is constrained by a lack of understanding in making maps, and there are some students who do not have laptops. Furthermore, in the second cycle, students are required to make a question instrument using the ishoyet method in their respective domicile areas. Students have to find their own rainfall data in BMKG. In Cycle II, they have more understanding in making maps, because students are very enthusiastic in learning.

Students always practice alone outside of face-to-face meetings with their regular friends or with their seniors. Therefore, in the second cycle, students' creativity increased very well. Furthermore, assessment with student work is an important assessment for students because it controls the process of implementing the activities carried out. Masnur Muslich (2011: 115), product assessment will assess students' abilities in: 1) exploring and developing. 2) Choose the right materials; 2) use the right tools; 3) demonstrate innovation and creation; 4) choose the shape and style in the resulting work. The assessment carried out in this study includes four indicators of student learning creativity including: creative personality, press (encouraging), creative process, and creative product. The last stage is the evaluation stage which is an important stage in project

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strategy learning. So that teachers can collaborate. To find out how far the objectives of practical learning can be achieved, the teacher must conduct an evaluation. In order for the results of the evaluation to measure the achievement of learning objectives, the evaluation must be carried out in accordance with the correct procedure. With a complete evaluation, student learning progress can be clearly identified, as well as the weaknesses contained in the learning process so that learning improvements can be made accordingly. The evaluation stage basically aims to determine the effectiveness of learning and also to assess student learning progress. The effectiveness of learning needs to be known for the purpose of improving the learning program. Likewise, in the implementation of Physics learning using project strategies, the evaluation process is very important. Given that in project-based learning, the projects that students work on are complex and consist of various kinds of activities, so each step of the type of work that students do must be made a student worksheet. Learning physics map making is very important to be applied as a learning process or learning media. All needs can be mapped, so it is hoped that when students graduate they are able to make their own learning media in the form of maps, even though students will become anything and everywhere.

4. CONCLUSION

Based on the results of classroom action research and the discussion that has been put forward, it can be concluded that learning using learning models at SMAN 2 Majalaya and SMAN 1 Cicalengka Bandung Regency Project based learning (PjBL) can increase student creativity in digital physics courses at both high schools. . That is, the results of observations of student creativity during the learning process show that in the second cycle of creativity observations on creative personal indicators of 82.74%, on press indicators (encouraging) of 91.20%, on creative process indicators of 83.3%, while in creative product indicator is 86.88%. Then the average of cycles 1, 2, and 3 is 83.69%. This can be seen from the change in student creativity from the first cycle by getting a complete score of 83.69%, then in the second cycle students get a complete score of 60.2, then in the second cycle has an average of 91, 20%.

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