



Project-Based Learning: In Perceptions of Prospective Students, Barriers and Challenges

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Abstract. Project Based Learning is a learning model that is very popular in developing various 21st century skills (Critical Thinking Skills, Creative Skills, Collaboration and Communication Skills). The course has implemented the PjBL model and its learning. There are various challenges and difficulties in implementing this learning model. The purpose of this study was to determine student perceptions, difficulties and challenges of implementing the model from student perceptions. This type of research is descriptive research. The instrument used is an online questionnaire. Data analysis using descriptive statistics with a sample of 80 students. The results of the study indicate that there are positive perceptions and experiences from the implementation of PJBL learning. However, it is difficult to find in its implementation which involves: time cooperation, time sharing, finding project ideas, sources, finding project tools and materials. But they suggest that this model can be continued in its application in learning.

Keywords: Barriers · Challenges · Project-Based Learning · Perception

1 Introduction

21st century skills require students to master many abilities including creative thinking, critical thinking and problem solving, communication, and collaboration [1]. Project based learning (PjBL) is a learning model that focuses on student activities. For example, students are required to create projects related to the concept of learning in accordance with the problems faced at that time. The project based learning (PjBL) learning model plays an important role in a learning process, especially in the 21st century. It is said so because the project based learning (PjBL) model focuses on developing the ability of students [2].

Project based learning learning model can be used to foster a more disciplined student learning attitude and can make students more active and creative in learning. The project-based learning model also has enormous potential to make learning experiences more interesting and meaningful. In addition, project based learning also facilitates students to investigate, solve problems, be student centered, and produce real project products [3]. Project-based learning model is quite useful in designing effective learning so that it is potential to meet the demands of learning [4].

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Biology is a science that cannot be separated from facts, concepts, propositions and facts principles relating to living things, as well as their interactions with the environment. In biology students are required to be able to master facts, concepts, propositions and principles. Biology is a science that requires understanding, application, analysis, synthesis and evaluation or high-level thinking. According to [5] Genetics is a part of Biology that requires creative thinking skills in solving various problems in society.

Most students consider genetics a difficult or unwelcome science. Many students are weak in understanding the concepts of genetics lecture material, this further strengthens the assumption that genetics is a difficult or unwelcome science [6]. Based on the results of the preliminary study conducted, it can be seen that as many as 85% of the total 80 student respondents who contracted the genetics course said that there were still many difficulties in understanding the material in the genetics course.

In the Biology Education study program, Faculty of Teacher Training and Education (FKIP), Jambi University, genetics courses have been implemented using the Project based learning model. However, in its implementation there are still many challenges and obstacles in realizing the project based learning model. To be able to evaluate and improve the development of students' understanding in learning, it is necessary to conduct research that aims to determine student perceptions, to find out the difficulties and to find out the challenges of implementing this model from student perceptions. The results of this study can be considered in evaluating the implementation of genetic learning by using a project based learning model to make it better and easier for students to understand.

2 Methods

The type of research used is descriptive research. Descriptive research is research by collecting data in the form of words, pictures, and not numbers. All the data collected is the key to what has been researched [7]. The data collection instrument used in this study was a questionnaire or questionnaire which was accessed online. The data obtained will then be carried out descriptive statistical analysis. Descriptive statistics are only related to describing or providing information about a data or situation or phenomenon. With descriptive statistics, it functions to explain conditions, symptoms, or problems with a frequency distribution [8]. The sample used in this study was 80 students with the criteria of students contracting genetics courses. The research location is in the Biology Education Study Program, FKIP, Jambi University.

3 Results And Discussion

3.1 Results

One way that can be applied is to carry out learning using the Project Based Learning model. Project Based Learning is a learning model that directs students to carry out learning by producing projects which are an effort to overcome a problem or solve a problem [9]. Many educators have applied and implemented Project Based Learning learning models, one of which is genetics courses.

Model dan Pendekatan Pembelajaran

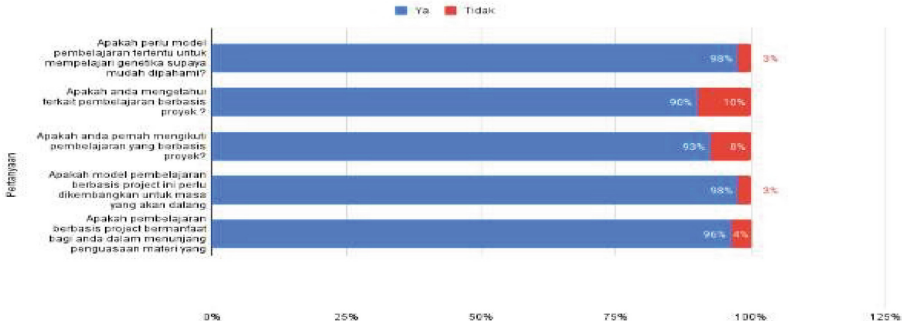


Fig. 1. Perception of Project Based Learning Model Needs for Students

Project Based Learning (PjBL) learning model is learning that involves students in constructing knowledge and completing meaningful projects related to the real world. According to [10], PjBL learning is learning by using problems as the first step in collecting and interpreting new knowledge based on the experiences students have had in real activities. The application of PjBL in learning can increase activeness and learning outcomes [11]; learning literacy and student motivation [12]; can increase students' creativity, Critical Thinking Skill [13]; [14].

Based on Fig. 1. The results showed that 98% of students stated that it was very important to use a learning model in genetics courses. This is because genetics is a difficult course and 85% of students have difficulty understanding genetic material which is known through initial observations, so a model is needed to solve this problem. One of the learning models that is known by prospective teacher students and is often applied in learning is the Project Based Learning Model. As many as 90% of students know about the project based learning model and 93% of students have learning experiences with this learning model. The learning experience using the student project based learning model is carried out in various subjects such as laboratory management, Environmental Science, Entrepreneurship, Innovative Biology Learning Media, Genetics, Animal Physiology, Plant Physiology.

Based on the courses that have been implemented using the project-based learning model, students are very experienced with the project-based learning model, so they are able to provide perception. Regarding the obstacles and challenges found in the implementation of the project-based learning model. Based on a questionnaire on the perception of the need for a project based learning learning model to students, 98% said that the project based learning learning model needed to be developed for the future. Because 96% stated that the project based learning model is useful in supporting the understanding of the material.

The project-based learning model is needed to develop 21st century skills that are useful for dealing with future problems. This is in accordance with research conducted according to [15] 21st century skills are important skills that must be mastered by everyone in order to succeed in facing challenges, problems, life, and careers in the 21st century.

In this learning, students are conditioned in a learning atmosphere that can develop 21st century skills, namely critical thinking and problem solving, creativity and innovation, collaboration, and communication. So the urgency to continue to implement the project-based learning model is very important to be developed.

Based on Fig. 2. About the experiences of students who have participated in the project based learning model, it can be seen that the students' perceptions are mostly positive. Easier to understand and know its direct relevance in real life, other experiences of students after implementing this project based learning learning model is that with project assignments, students get a lot of new experiences that have never even been obtained in ordinary learning activities, through project learning models. Based on this learning, students have the perception that this model can create teamwork, other experiences from learning with the project based learning model are full of challenges because With this project-based learning model, it is designed by working on projects that are rooted in a problem that must be solved, and other experiences that students get while participating in the project-based learning model are being able to generate funds for the project innovations they have made so that they can indirectly train the entrepreneurial spirit of students. All experiences presented by prospective teacher students are positive experiences, meaning that with the application of this learning model, prospective teacher students will gain a lot of experience in applying theoretical knowledge in real life relevance.

Based on Fig. 3. Regarding the responses or comments given by prospective teacher students to the project based learning learning model, all comments are positive. These comments include student teacher candidates who think that the project based learning model is very good to apply because with this learning model, can train students to develop and practice their thinking skills and skills in accordance with the demands of the 21st century. In addition, students think that the project-based learning model is very

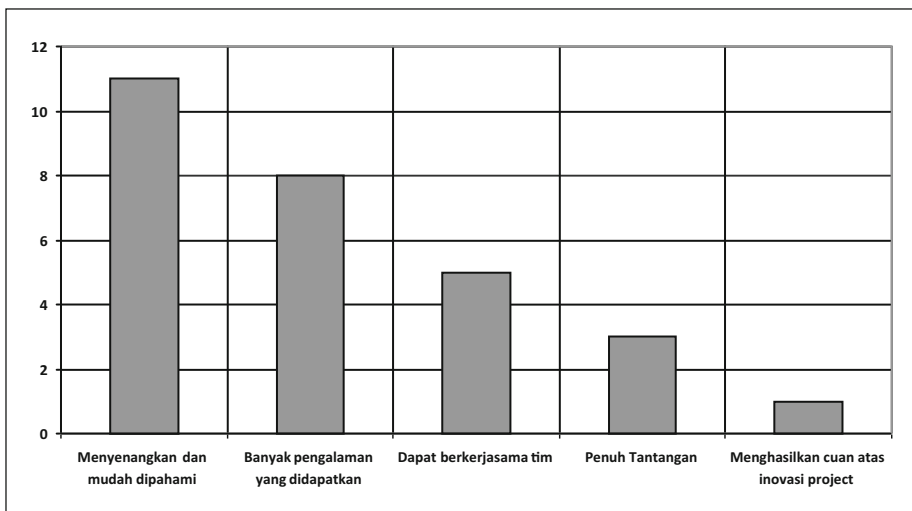


Fig. 2. Student experience in following the Project Based Learning Model

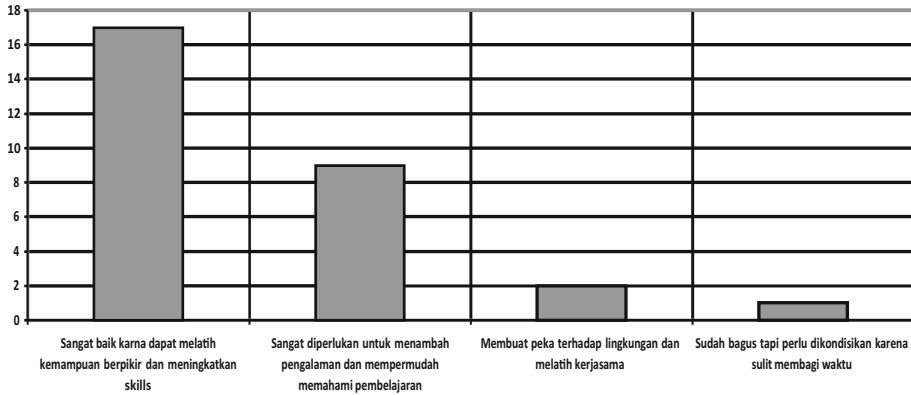


Fig. 3. Student responses (comments) regarding the Project Based Learning Model

necessary to add experience and make it easier for students to understand learning, for example, genetics learning which is one of the courses in biology education which is a material difficult to understand by students, with this model then will accelerate students’ understanding of existing theories because they are supported by projects that must be done so that the theories conveyed in learning become easier to understand because there are applications in real life. In addition, another response to the project-based learning model is that this model will give students sensitivity as prospective teachers to the environment and train collaboration. Because with the project assignment, there are several progress reports and it is hoped that students can manage their time.

Based on Fig. 4. Regarding the difficulties found in the implementation of the project-based learning model which aims to evaluate the implementation of the project-based learning model in the future, it can be seen that these difficulties include difficulties in understanding the given project system, difficulties in building teamwork, difficulty in dividing and managing time, difficulty in finding project ideas and difficulties in funding if project creation costs money.

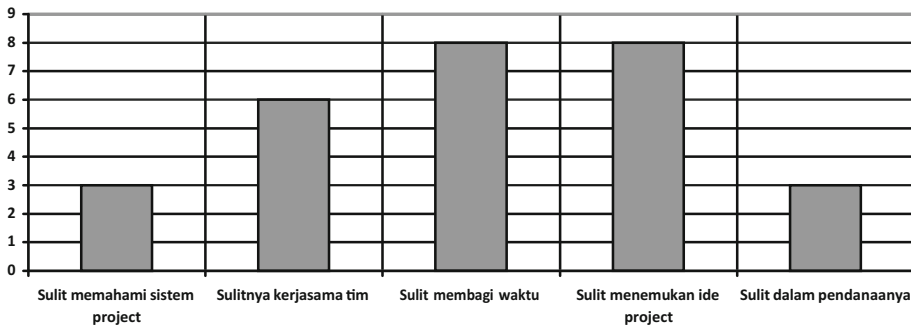


Fig. 4. Difficulties encountered in implementing the Project Based Learning Model

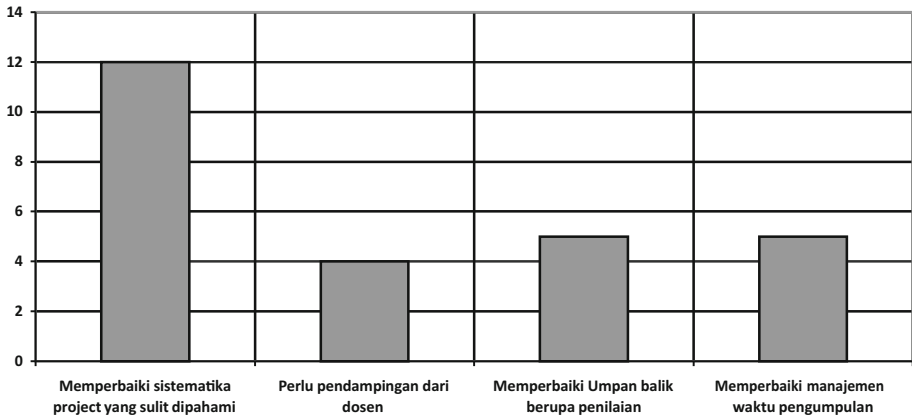


Fig. 5. Evaluation that must be carried out on the implementation of the Project Based Learning Model

Based on Fig. 5. Regarding the evaluation that must be carried out if implementing the project based learning model in the future, it is necessary to improve project systematics that are difficult to understand, meaning clarify assignments and emphasize problems that must be solved by students, in addition to student perceptions in project based learning learning models require assistance from supervisors because in some courses there is minimal assistance by the lecturer after the assignment is given so that the assessment process becomes less than optimal, some courses do not provide feedback to prospective teacher students regarding the assessment, then the assessment needs to be carried out and notified to students, in addition to knowing the value of the results Projects carried out by the team can also be used as an appreciation for teamwork because they have been able to complete the project, then in implementing the project based learning model, it is necessary to improve time management. The collection is too small, besides that, it is necessary to make a timeline for collecting progress reports as a form of assessing the process that has been carried out by students.

3.2 Discussion

Research on Teacher Candidates' Perceptions of Obstacles and Challenges in implementing the Project Based Learning learning model in the Genetics Course is carried out in the odd semester of the 2022/2023 academic year. The research subjects were 80 students of the Biology Education Study Program. The genetics course has carried out learning using the Project Based Learning model. Based on the learning that has been done, there is a perception of students as prospective teachers regarding the obstacles and challenges to the implementation of this model so that it can be used as a guide in improving the learning of genetics courses in the future.

From the results of the study, it was obtained data that students had very experience in carrying out learning with project-based learning models, so they were able to provide perceptions regarding the obstacles and challenges found in the implementation of

project-based learning models. The project-based learning model needs to be developed for the future because it can support skills and facilitate understanding of the material.

Through this project-based learning model, students have the perception that this model can create teamwork, other experiences from learning with the project-based learning model are full of challenges because the project-based learning model is designed by working on projects that are rooted in a problem that must be solved. Completed, and other experiences that students get while participating in the project-based learning model are being able to generate funds for the project innovations they have made so that they can indirectly train students' entrepreneurial spirit. All experiences presented by prospective teacher students are positive experiences, meaning that with the application of this learning model, prospective teacher students will gain a lot of experience in applying theoretical knowledge in relevance in life.

The responses or comments given by prospective teacher students to the project based learning learning model, all comments are positive. These comments include prospective teacher students who think that the project based learning model is very good to apply because with this learning model it can train students to develop and train their thinking skills and skills in accordance with the demands of the 21st century. In addition, students think that the project-based learning model is needed to add experience and make it easier for students to understand learning.

The difficulties found in the implementation of the project based learning learning model which aims to evaluate the implementation of the project based learning model in the future, it can be seen that these difficulties include difficulties in understanding the given project system, difficulties in building teamwork, difficulties in sharing and time management, difficulties in finding project ideas and difficulties in funding if project creation costs money.

The evaluation that must be carried out if implementing the project based learning learning model in the future is the need to improve project systematics that are difficult to understand, meaning clarify assignments and emphasize problems that must be solved by students, besides that student perceptions in project based learning learning models require assistance from supporting lecturers because in some subjects lectures with minimal assistance by lecturers after assignments are given so that the process assessment becomes less than optimal, in addition, it is necessary to improve the management of too little collection time, besides that it is necessary to make a timeline for collecting progress reports as a form of process assessment.

4 Conclusion

21st century skills require students to master many abilities including creative thinking, critical thinking and problem solving, communication, and collaboration. The project-based learning model is quite useful in designing effective learning so that it has the potential to meet the demands of learning. In the Biology Education study program, Faculty of Teacher Training and Education (FKIP), Jambi University, genetics courses have been implemented using the Project based learning model. However, in its implementation there are still many challenges and obstacles in realizing the project based

learning model. The results show that the difficulties in its implementation involve: team-work, time sharing, finding project ideas, funding, finding project tools and materials. But they suggest that this model can be continued in its application in learning.

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