

Effectiveness Of Project-Based Learning Models in 11th Grade Biology Subject At SMAN 3 Serang City

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Abstract

The purpose of conducting this research is to determine the effectiveness of the collaboration of various learning methods, one of which is the application of Project Based Learning (PjBL) methods at SMAN 3 Kota Serang. This research was conducted on May 5 2023 at SMA Negeri 3 Kota Serang involving 2 grade 11 students and 1 biology teacher who taught biology in grade 11. This research used a qualitative method because it only stated what happened in real and natural terms. The qualitative approach prioritizes the observation of the phenomenon under study. The data collection technique used in this study is the technique of collecting interviews and documentation during observation. Observations were carried out by interviewing the resource person, namely the Biology Teacher at SMAN 3 SERANG CITY and also some students who were teaching biology subjects. Data analysis and processing was carried out using qualitative methods, where researchers conducted interviews, asked questions related to the topic. The research results from this observation show that currently SMA Negeri 3 is Implementing Project Based Learning (PjBL). Some of the projects that have been completed by SMA Negeri 3 students are projects to paint parts of organs on material on human organ systems. Apart from painting the organs, the project that has been completed is learning through the Canva application. In its application, it indirectly involves students' ideas and creativity so that they can convey their learning through art. The application of biology learning combined with art has proven effective, because students can better understand the material so that the demands of the learning process are met. The learning model and the existence of collaboration that makes learning not monotonous is a must for a teacher to be able to understand the characteristics and abilities of students. Then there are several problems/obstacles that are felt by students, namely the lack of learning time is the biggest obstacle. In SMA Negeri 3 there are often various events outside of learning that require students to participate, so the biology lesson schedule is abolished. Furthermore, they experience obstacles to learning resources. They are facilitated by the school, namely textbooks that are loaned, but in reality the information is often incomplete so that we are forced to look for other sources which are sometimes difficult for us to get.

Keywords: project based learning, education, biology subject.

A. INTRODUCTION

Education is all knowledge about lifelong learning, in all situations and in all places, and has a positive impact on the development of each individual. In the broadest sense, teaching is also a teaching process, and learning can take place in any environment and at any time (Amirin: 4 2013). Education is education carried out by teachers to students, exemplary, learning, guiding and improving moral ethics.

Education is always related to curriculum. To achieve educational goals, you must use the curriculum. So, it can be said that the curriculum is a reference for the process of administering education in Indonesia (Angga et al., 2022). This statement shows that the curriculum of course cannot be regarded as a random document, but as a tool and also as a reference for those who conduct training to carry out the best teaching and learning process to achieve educational goals. This certainly illustrates the educational goals that can be achieved in education. Facilitating the educational process is the goal of creating a curriculum. But in reality, the existing curriculum often changes, causing confusion and complicating the educational process. The curriculum has changed many times from 1947 until now. Basically, the curriculum changes with the change of ministers, which brings up both good and bad points. Education is not only an effort to achieve learning outcomes, but education also aims to find ways to realize an effective learning process in learning activities, so that good and appropriate planning is needed in accordance with the applicable curriculum. In formal learning activities, the curriculum is used as a benchmark for achieving learning goals, and the government is slowly starting to implement the Free Learning Curriculum Program starting in 2022.

Biology subject is one of the subjects that emphasize understanding and concepts. The definition of biology is the science that studies living things and their environments (Khoirudin, 2019; Tammu, 2018). Biology learning in schools requires students' abilities to analyze, apply, understand and apply conceptual and procedural sources of knowledge to be able to solve problems (Aqil, 2017; Aripin, 2018). The demands of the 2013 curriculum are also related to this, the explanation contains that the biology learning process in class is more focused on the active role of students and how they collect data and information independently from various relevant sources which can then be retrieved (AR Setiawan, 2019).

In explaining biology, teachers tend to teach the memorization method (Suryanti et al., 2019). This is one of the reasons why students have difficulty in receiving biology subject matter because in general, learning biology is not with the learning model of memorizing all parts of the material, but by understanding the concepts contained in it (Yusup, 2018). According to the material studied, aspects of biological material not only refer to concepts derived from relevant theories or concrete scientific facts, but also concepts derived from abstract objects (Aisyiyah & Amrizal, 2020; Pratiwi et al., 2019; Rahmadani et al., 2017). Conceptualizing aspects of the material like this is the basis for understanding the material. The study of biology can be difficult due to complex concepts and terminology, and biology trains learners to develop comprehensive thinking from microscopic to macroscopic scales (Noviati, 2020; Tamba et al., 2020).

In accordance with the research conducted at SMA Negeri 3 Kota Serang, the causes are many things both from students, books, learning time span and teacher methods carried out in learning. Problems from students include their different learning interests and abilities, problems from books include books provided with incomplete material, relatively monotonous displays, problems with the learning time span, namely their short learning time. Then the problem of the teacher's systematic teaching in teaching which does not attract students' attention and is monotonous so that it is boring, for example the method used is lecturing and summarizing. Therefore, one of the efforts to maximize biology learning is with a project-based learning program.

Project-based learning means learning using techniques that prioritize creativity in the art of teaching. The role of the teacher in this method is as a support that provides

space for students to ask questions about theory and encourages students to actively participate in class (Trianto, 2014: 42). According to Yahya Muhammad Mukhlis, the applied learning model provides an opportunity for the teacher to fully control the ongoing teaching process. the proposed teaching and learning activities include project work (Trianto, 2014: 42). Project-based learning models are often referred to as teaching methods that use methods to facilitate the process of understanding and assimilation of theories offered by students. This model uses a contextual approach and encourages students to think critically. Consider the best decision to solve the problem. Considering the advantages and disadvantages of the decision used as a solution is also part of the given theory (Wena, 2010: 145).

Students are expected to increase their interest in learning because this method trains students to orient their own knowledge by actively participating in the learning process. The problem that we can take in this research is to maximize the system and method of student learning in the teaching and learning process using the project base learning (PjBL) learning model (Ahmad Satibi 2022:61).

The purpose of the project-based learning model according to Trianto (2014:49) the objectives of this PjBL method are:

- 1) provide extensive knowledge to students when dealing directly with problems
- 2) develop critical thinking and the ability to deal with problems that arise. The purpose of its application is thus stated to provide opportunities for students to practice and perfect critical thinking to solve given problems. In addition, this method can also be used to further develop students' understanding.

Therefore, this article will discuss the effectiveness of the application of project-based learning in biology subjects by reviewing several relevant journals to determine the relationship between the effectiveness of the application of project-based learning media in biology subjects.

B. METHODS

The research method in this study uses qualitative methods because it does not use numbers but only states what is real and natural. The qualitative approach prioritizes the observation of the observed problems. Data collection methods in this study used interviews and documentation techniques. An interview is the process of collecting information or data through two-way communication to achieve a goal by asking the source directly. The interview was conducted by asking directly the biology teacher at SMAN 3 Serang City and also some students who were teaching biology subjects. Data analysis and processing were carried out using qualitative methods, where researchers conducted interviews and asked questions related to the topic. The researcher then recorded the results of the interviews and compared the answers given in the interviews.

The definitions given to biology teachers and students who teach these subjects, art in learning, learning effectiveness, and solutions in dealing with obstacles that occur in biology learning are operational definition variables. The explanation of the operational definition of each variable is as follows: the biology teacher and the students who teach the subject are about the things that are learned in the subject. The function of art in the field of education is the pursuit of educational goals. In the world of education, art also has an important impact on the mental and physical development of students. In fact, with art education, students' attitudes can be formed in a better direction because art can bring the values and norms that exist in society to students. In art, everyone is judged by their own

creativity and intelligence. Learning effectiveness is the result obtained in biology learning combined with art. The solution to facing obstacles is how biology behaves in facing obstacles in teaching biology and solutions when students do not fulfill the biology learning process.

C. RESULT AND DISCUSSION

PjBL stands for project-based learning," which is instruction centered around real-world projects or assignments. In PjBL, students engage in projects or assignments that require problem solving, research, collaboration, and the presentation of results. As per PjBL guidelines, students learn actively and engage while participating in a more detailed and in-depth learning process. They are given a question or questions they need to respond to about the work project or task for which they are responsible.

Project-based learning is learning that takes up a lot of time and focuses on student activities to understand a concept or principle by exploring and finding problems in depth related to solutions that can be implemented in project work, so that students experience a meaningful learning process to build their own knowledge. The focus of learning is on student activities to solve problems through the application of skills ranging from research, analysis, and creation to presenting learning products based on real-life experience.

His study was carried out on May 5, 2023, at SMA Negeri 3 Serang City with two students in grade 11, and one biology instructor who instructs biology courses in that grade. As a result of the findings, project-based learning is currently being used in SMA Negeri 3. Some of the projects that SMA Negeri 3 students have finished involve painting organ parts on materials that depict the human organ systems. The assignment that has been finished includes learning how to use the Canva tool in addition to painting the organs. It uses students' ideas and creativity in an indirect way so they can express their learning via art.

Biology teachers use a variety of tactics and techniques that they have tailored to the subject matter. The method used must be adjusted to the material in order for the method to be successful. For instance, practice painting is done when students are studying organ systems so that they can quickly comprehend and recall the names of the parts of these organs. There are also numerous additional teaching methods. For instance, each student is required to memorize a portion of the coordination system content in order to understand the process. The kids have so far responded favorably to the models and approaches used, and they are very enthusiastic.

The teacher must have a variety of learning methods because a teacher is required to be able to read the character of each student so that the material applied can be fulfilled. Apart from being a teacher's demand, this is supported by the current curriculum, namely the independent learning curriculum. Biology learning can be done not only in the classroom, but there is a must for learning outside the classroom, because what is learned in biology is living things, therefore students must be directly involved. Learning outside the classroom is carried out when students teach grade 10, namely studying plants and animals. The students were asked to do a project to be able to identify the taxonomy and recognize the species names of plants that are deliberately planted in the school environment with the aim of direct teaching materials. Each of these plants is given a species name and a barcode which later students can access directly. This is used as an artistic implication because of the emergence of ideas that foster student creativity.

The application of biology learning combined with art has proven effective, because students can better understand the material so that the demands of the learning process are met. The learning model and the existence of collaboration that makes learning not monotonous is a must for a teacher to be able to understand the characteristics and abilities of students.



Figure 1. Documentations

Then there are several obstacles that are felt by students, namely the lack of learning time is the biggest obstacle. In SMA Negeri 3 there are often various events outside of learning which require students to participate, so the biology lesson schedule is abolished. Furthermore, they experience obstacles to learning resources. They are facilitated by the school, namely textbooks that are loaned, but in reality, the information is often incomplete, so we are forced to look for other sources, which are sometimes difficult for us to get.

Advantages and Disadvantages of the Project-Based Learning Model The PjBL model has the advantages of providing space for students to expand their thinking and understanding of the problems that occur, direct training for students to introduce them to thoughts and skills, adapting modern developments that must be implemented by increasing students' skills through practice, theory and application (Djamarah & Zain, 2011:83). In addition to the advantages of this model, it also has disadvantages, such as: student activity can lead to unpleasant teaching situations, so that a few minutes are needed so that students can speak freely, limited use of student time which leads to poor teaching situations. Therefore it is entitled to give additional time to each group in rotation (Trianto, 2014:49). Student activities in the learning process are essentially interactive activities between teachers and students where they are involved in interactions that require reciprocity to determine the level of understanding of the material presented. In other words, learning is not only one-way, but teachers who are always active in distributing subjects must play an active role.

The PBL learning applied at SMA Negeri 3 Kota Serang has proven to be effective because students can more easily understand because they are directly and clearly involved with the object being studied. Students are very interested in using a variety of learning methods including this PBL. As well as teachers can see the potential of each student through this learning.

D. CONCLUSION

Based on the description above, it can be concluded that education is an important thing, because through education, a person can gain knowledge, skills and understanding that will be useful in life. Judging from the current conditions/circumstances at SMAN 3 Serang City, it can be stated that the importance of collaborating with various learning methods so that the material taught can be easily accepted by students. The application of project-based learning methods is very effective for 11th grade students at SMAN 3 Serang City. Collaborative project-based learning methods are the learning method most interested in by 11th grade students at SMAN 3 Serang City, with biology teachers using the in this learning, the students become more enthusiastic in participating in learning. there are significant differences regarding variations in learning methods in the classroom, students prefer learning methods that are combined with art, namely in the form of project based learning, compared to extemporaneous learning methods or direct learning models which are only carried out by explaining material in front of the class without involving students to explore direct learning material so that it can be easier to understand. Based on the results and discussion of the research obtained, the advice given is for biology teachers, namely that it takes firmness and foresight in managing learning time at school so that there are no obstacles for students in studying biology and creativity is needed in the learning methods that are presented.

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REFERENCES

- Anggraini, P. D., & Wulandari, S. S. (2021). Analysis of the use of project-based learning models in increasing student activeness. *Journal of Office Administration Education (JPAP)*, 9(2), 292-299.
- Azizah, N., & Alberida, H. (2021). What are the problems of learning biology in high school students? *Journal for Lesson and Learning Studies*, 4(3), 388-395.

- Nurfitriyanti, M. (2016). Project-based learning model on mathematical problem solving ability. *Formative: Scientific Journal of Mathematics and Natural Sciences Education*, 6(2).
- Thaariq, Z. Z. A., & Izza, J. N. (2021). Utilization of Biological Elements as Learning Resources in the Characteristics of Educational Technology. *BIO-EDU: Journal of Biology Education*, 6(3), 161-172.
- Triana, L., Aprinaldo, A., Ikmaluddin, A. B., Satibi, A., & Cahyadi, F. D. (2022, December). PENINGKATAN PRESTASI BELAJAR DENGAN MODEL PROJECT BASED LEARNING PADA MATA PELAJARAN TEKNIK PENDEDERAN. In *Indonesian Conference of Maritime* (Vol. 1, No. 1, pp. 59-69).