



Analysis of Student Learning Outcomes According to the Implementation of Project-Based Learning (PJBL)

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Abstrak

Penelitian ini bertujuan untuk mengetahui hasil belajar mahasiswa ditinjau dari penerapan pembelajaran *Project Based Learning (PjBL)* di Jurusan Fisika, Fakultas Matematika dan Ilmu pengetahuan Alam, Universitas Negeri Makassar. Jenis penelitian yaitu penelitian survei yang bersifat deskriptif untuk memperoleh data kuantitatif. Populasi dalam penelitian ini adalah seluruh mahasiswa di Jurusan Fisika angkatan 2024/2025 yang saat ini berada pada semester 2 yang terdiri atas 4 kelas dengan jumlah mahasiswa sebanyak 100 orang. Total sampel dalam penelitian ini berjumlah 49 orang. Teknik penarikan sampel dalam penelitian ini menggunakan purposive sampling. Variabel dalam penelitian ini adalah hasil belajar mahasiswa. Data yang diperoleh menunjukkan bahwa nilai hasil belajar mahasiswa ditinjau dari penerapan pembelajaran *Project Based Learning (PjBL)* di Jurusan Fisika FMIPA UNM mayoritas berada pada kategori sangat tinggi dengan persentase mencapai 75,51%. Faktor nilai hasil belajar mahasiswa yang sangat tinggi karena PjBL mendorong mahasiswa untuk belajar secara aktif, memecahkan masalah, dan menghasilkan produk nyata, yang semuanya berkontribusi pada pemahaman yang lebih mendalam dan hasil belajar yang lebih baik.

Kata kunci: Hasil Belajar, Praktikum Fisika Dasar, Project Based Learning

Abstract

This research aims to determine student learning outcomes in terms of the implementation of Project Based Learning (PjBL) in the Physics Department, Faculty of Mathematics and Natural Sciences, Makassar State University. The type of research is descriptive survey research to obtain quantitative data. The population in this research were all students in the Physics Department of the 2024/2025 class who are currently in the 2nd semester consisting of 4 classes with a total of 100 students. The total sample in this research was 49 people. The sampling technique in this research used purposive sampling. The variable in this research was student learning outcomes. The data obtained showed that the value of student learning outcomes in terms of the implementation of Project Based Learning (PjBL) in the Physics Department, Faculty of Mathematics and Natural Sciences, Makassar State University was mostly in the very high category with a percentage reaching 75.51%. The factor of the very high value of student learning outcomes is because PjBL encourages students to learn actively, solve problems, and produce real products, all of which contribute to deeper understanding and better learning outcomes.

Keywords: Learning Outcomes, Basic Physics Practicum, Project Based Learning

Introduction

The Education in Indonesia is crucial because it plays a crucial role in individual development and national progress. Education not only provides knowledge and skills but also shapes character, increases employment opportunities, and fosters innovation. Science education is crucial because it helps us understand the world around us, develop critical thinking skills, and prepare for the future. Science provides knowledge about the universe, natural phenomena, and the fundamental principles that govern it. Furthermore, science also fosters the development of critical thinking skills, which are crucial in a complex and information-saturated world. Through specially designed science activities, children can learn to observe, ask questions, and find their own answers to all essential aspects of critical thinking (Churiyah, 2024).

In response to the dynamics of education, a learning model that supports the learning process is needed. Various innovations in learning are needed considering increasingly creative learning and the constantly changing needs in learning strategies (Syahrial, 2024). One learning innovation that can be used is the implementation of the Project-Based Learning (PjBL) model. Project-based learning models are a major focus in curriculum renewal. Project-based learning has become a major focus in today's educational development, particularly in efforts to improve students' critical thinking skills (Syamsul, 2024). The Project-Based Learning (PjBL) model is very important in science learning because it encourages students to learn actively, develop critical thinking and problem-solving skills, and connect scientific concepts to the real world. PjBL helps students not only memorize facts but also understand scientific concepts through direct experience and projects relevant to their lives.

Based on **the researchs of observations** conducted by the author, it shows that the average value of student learning outcomes in the Physics Department, Faculty of mathematics and natural science, Makassar State University for the basic physics practicum 2 course is still in the moderate category. This less-than-optimal learning outcome can be caused by various factors, both internal and external. Internal factors include a lack of interest, motivation, and understanding of basic concepts, as well as a lack of concentration and discipline in doing

assignments. External factors include a lack of family support, an uncondusive learning environment, ineffective teaching methods, and a lack of availability and utilization of learning resources. According to Nugraha (2021), the cause of low learning outcomes is due to the teacher's aspect, namely teachers rarely ask basic questions to students at the beginning of learning, so that students' thinking is not stimulated to think at the beginning of the learning process. In addition, teachers rarely use project-based learning models in the learning process so that students' creativity is lacking and teachers only rely on the ability to memorize facts and concepts. In addition, according to Fauziah (2022), a factor that influences low student learning outcomes is the existence of learning barriers that occur because students do not understand the learning objectives and content of the material well.

The urgency of this research is that if this research is not conducted, it will impact the students' learning outcomes. In this case, there is no information related to the analysis of the learning outcomes of physics students for the basic physics practicum 2 course, so that educators will find it difficult to further map the causes of the less-than-optimal learning outcomes. Low learning outcomes can have a negative impact on various aspects, including understanding of subsequent material, learning motivation, and even overall student behavior. This impact can be short-term or long-term. Low learning outcomes can cause students to feel frustrated and lose interest in certain courses or even in learning activities in general (Syamsul, 2025)

The novelty of this research compared to other studies is that in this research, the learning outcomes were analyzed in terms of the implementation of Project Based Learning (PjBL) while the research conducted by (Nurhaida, 2024) analyzed the difficulties of students in solving physics problems in class XI students of SMA Negeri 2 Makassar. In addition, there is also research conducted by (Dewi, 2024) which analyzed the physics learning outcomes of class XI at SMA Negeri 10 Makassar

Based on these assumptions, it is necessary to conduct an analysis of learning outcomes in terms of the application of Project Based Learning (PjBL) in the basic physics practicum course 2 in order to provide an in-depth picture of the extent to which learning outcomes have been formed in students of the

Physics Department, Faculty of Mathematics and Natural Sciences, Makassar State University.

Formulation of The Problem

Based on the background above, the problem formulation in this research is as follows: “How is the learning outcomes of students according to the application of Project Based Learning (PjBL)?”

The Aims of This Research

The aims of this reseach is describing the learning outcomes of students according to the application of Project Based Learning (PjBL).

Method

This research is descriptive and uses a survey method to obtain quantitative data. The researcher did not administer any treatment to the respondents, so this research only provides a picture of student learning outcomes in terms of the implementation of Project-Based Learning (PjBL) without linking it to other variables.

This research was conducted in the Department of Physics, Faculty of Mathematics and Natural Sciences, Makassar State University, during the even semester of the 2024/2025 academic year.

The population in this research were all students in the Physics Department of the 2024/2025 class who are currently in the 2nd semester consisting of 4 classes with a total of 100 students. The sampling technique in this research used purposive sampling, namely a sampling technique with certain considerations. The reason for using purposive sampling was because the lecturers who conducted this research did not all teach the basic physics practicum 2 course in all classes in the 2024/2025 class but only taught in 2 classes, namely the ICP class and the science class, so from the 4 classes that became the population, only 2 classes could be used as samples, namely the ICP class (19 students) and the science class (30 students), so the total sample in this research was 49 people.

The variable in this research is learning outcomes. Learning outcomes are students' ability to achieve cognitive aspects in Bloom's revised taxonomy of material after participating

in the learning process for a certain period, including remembering, understanding, applying, analyzing, evaluating, and creating, according to the indicators in the learning module. These learning outcomes will be demonstrated through written test research in the form of essays.

The data collection technique used in this research was to administer a learning outcome test to a predetermined sample. The instrument was structured in the form of essay questions covering the indicators of remembering (C1), understanding (C2), applying (C3), analyzing (C4), assessing (C5), and creating (C6). Based on the learning outcome test data, student learning outcome values were categorized through the implementation of Project Based Learning (PjBL).

Result and Discussion

This research presents descriptive statistical data on student learning outcomes from the perspective of Project-Based Learning (PjBL) implementation. Descriptive statistical analysis was used to determine the learning outcome values of students in the Physics Department, Faculty of Mathematics and Natural Sciences, Makassar State University. The research are described as follows.

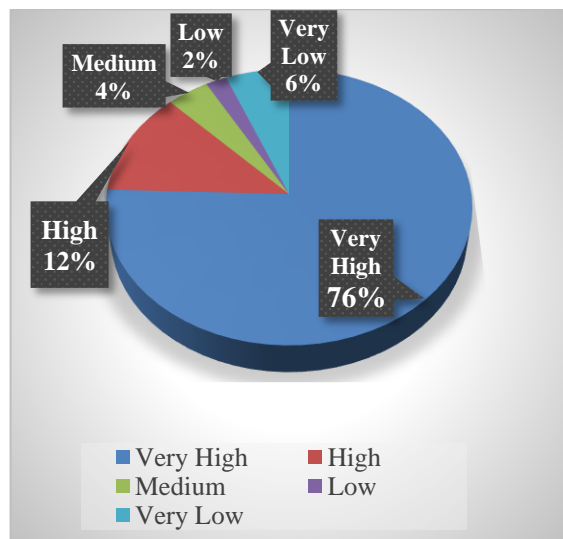
The general description of student learning outcomes from the perspective of Project-Based Learning (PjBL) implementation in the Physics Department, Faculty of Mathematics and Natural Sciences, Makassar State University, is as follows.

Table 1. *Frequency Distribution of Learning Outcome values*

Interval of value	Category	Σ Earned Value	
		Frequency	Percentage
81 - 100	Very High	37	75,51%
61 - 80	High	6	12,24%
41 - 60	Medium	2	4,08%
21 - 40	Low	1	2,04%
0 - 20	Very Low	3	6,13%

Based on Table 4.1, the student learning outcomes based on the implementation of

Project-Based Learning (PjBL) in the Physics Department are classified as very high, with a percentage reaching 75.51%. This is clearly seen in Figure 4.1 below:



Picture 1. *Pie Chart of Student Learning Outcomes*

Based on the data obtained, it shows that student learning outcomes reviewed from the implementation of Project Based Learning (PjBL) in the Physics Department, FMIPA UNM, the majority are in the very high category with a range of 80 - 100. Most student values in the very high category are in the range of 81.57 - 90.86. This can occur because PjBL encourages students to learn actively, solve problems, and produce real products, all of which contribute to deeper understanding and better learning outcomes. This is in line with research conducted by Made (2022) which concluded that the use of the Project Based Learning model can help students in increasing their activeness and learning outcomes in machine tool and production courses where the results of the research showed that student learning outcomes increased by 58.33% in the cognitive aspect, 66.7% in the affective aspect and 91.65% in the psychomotor aspect after following the learning process by implementing the Project Based Learning (PjBL) learning model. Likewise, research conducted by Agusdianita (2023) concluded that the PjBL method can help improve student learning outcomes because the PjBL method aims to: 1) provide broad insight to students when facing problems directly; 2) develop critical thinking skills and expertise in facing problems received directly.

Conclusion

Based on the research conducted, it can be concluded that student learning outcomes, in terms of the implementation of Project-Based Learning (PjBL) in the Physics Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Malang (FMIPA UNM), are in the very high category, with a percentage reaching 75.51%, covering the indicators of remembering (C1), understanding (C2), applying (C3), analyzing (C4), assessing (C5), and creating (C6).

Based on the research conducted, the researcher recommends several things, including the following: (1) It is hoped that the student learning outcomes obtained from the implementation of Project-Based Learning (PjBL) in the Physics Department, Faculty of Mathematics and Natural Sciences, Universitas Negeri Malang (FMIPA UNM) will be maintained. (2) It is hoped that these learning outcomes will also be achieved in other courses.

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Curriculum Vitae

Syamsul Wahid S was born in Kalimbua on November 27, 1989. The author is the third of three children, the son of Syamsuddin, BA and Djumaria. The author began his education at MIS Kalimbua then continued his education at MTS Negeri 1 Baraka. After graduating, the author continued his education at SMA Negeri 1 Baraka and graduated in 2008. In 2008, the author was accepted as a student majoring in physics by taking the International Class Program (ICP) class in the Physics Education study program, Faculty of Mathematics and Natural Sciences (MIPA), Makassar State University (UNM). In 2015, the author continued his educational studies at the Postgraduate Program of Makassar State University, Physics Education Study Program. Currently, the author is one of the lecturers in the Physics Department, Faculty of Mathematics and Natural Sciences (FMIPA), Makassar State University (UNM).