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A COMPARATIVE STUDY ON THE EFFECTIVENESS OF CASE-BASED AND PROJECT-BASED LEARNING IN ENHANCING STUDENT LEARNING OUTCOMES

Abstract
This study aims to compare the effectiveness of Case-Based Learning (CBL) and Project-Based Learning (PBL) in improving student learning outcomes. The study was carried out on 60 sixth-semester students of the Educational Technology program at Universitas Negeri Makassar, divided into two groups: CBL and PBL. A quasi-experimental method with a pre-test and post-test design was employed. The results indicate that both methods positively contributed to students' learning outcomes, but with varying degrees of effectiveness. The average pre-test score for the CBL group was 66, while the PBL group scored 64, showing relatively equal initial abilities. After the learning intervention, the CBL group improved by 18.2%, achieving an average post-test score of 78, whereas the PBL group showed a more significant improvement of 31.3%, reaching an average score of 84. Statistical analysis using the t-test revealed a significant difference in learning outcomes between the two groups ($p < 0.05$), indicating that PBL was more effective than CBL. These findings suggest that PBL is superior in enhancing student comprehension through active engagement in real-world projects. Therefore, PBL is recommended as a more effective instructional strategy, particularly for courses requiring applied skills. Future research should explore factors that maximize PBL effectiveness and its application across various disciplines.
Keywords: Learning Effectiveness, Case-Based Learning, Project-Based Learning.

Abstrak
Penelitian ini bertujuan untuk membandingkan efektivitas Pembelajaran Berbasis Kasus (Case-Based Learning/CBL) dan Pembelajaran Berbasis Proyek (Project-Based Learning/PBL) dalam meningkatkan pencapaian belajar mahasiswa. Penelitian dilakukan pada 60 mahasiswa semester 6 Program Studi Teknologi Pendidikan di Universitas Negeri Makassar, yang dibagi menjadi dua kelompok: CBL dan PBL. Metode penelitian yang digunakan adalah eksperimen semu dengan desain pre-test dan post-test. Hasil penelitian menunjukkan bahwa kedua metode berkontribusi positif terhadap peningkatan hasil belajar mahasiswa, tetapi dengan efektivitas yang berbeda. Rata-rata skor pre-test kelompok CBL adalah 66, sedangkan kelompok PBL adalah 64, menunjukkan kemampuan awal yang relatif setara. Setelah pembelajaran, kelompok CBL mengalami peningkatan hasil belajar sebesar 18,2% dengan skor rata-rata post-test 78, sedangkan kelompok PBL mengalami peningkatan yang lebih signifikan sebesar 31,3% dengan skor rata-rata 84. Analisis statistik menggunakan uji t menunjukkan bahwa perbedaan hasil belajar antara kedua kelompok signifikan ($p < 0,05$), dengan metode PBL lebih efektif dibandingkan CBL. Hasil ini mengindikasikan bahwa PBL lebih unggul dalam meningkatkan pemahaman mahasiswa melalui keterlibatan aktif dalam proyek nyata. Oleh karena itu, PBL direkomendasikan sebagai strategi pembelajaran yang lebih efektif, terutama dalam mata kuliah yang menuntut keterampilan aplikatif. Penelitian selanjutnya disarankan untuk mengeksplorasi faktor-faktor yang dapat memaksimalkan efektivitas PBL serta penerapannya di berbagai disiplin ilmu.

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Kata Kunci: Efektivitas Pembelajaran, Pembelajaran Berbasis Kasus, Pembelajaran Berbasis Proyek.

INTRODUCTION

In the era of modern education, innovation in learning methods has become a necessity to enhance the quality of student learning outcomes. According to Utomo (2023), innovation in interactive learning media plays a crucial role in improving learning effectiveness in the digital age. Therefore, more interactive approaches such as Case-Based Learning (CBL) and Project-Based Learning (PBL) are increasingly being implemented to address these challenges. CBL encourages students to analyze real-life situations, while PBL provides hands-on experience in solving problem-based projects. Both approaches strive to foster active student participation in learning and equip them for an evolving job market. Thus, innovation in learning methods not only improves educational effectiveness but also shapes students to be more adaptive and competitive. The rapid development of technology and the increasing demands of the job market require more applicable and problem-solving-based learning methods. Khofifah et al. (2024) stated that "the role of technology in education is crucial because technology can enhance learning effectiveness by providing wider access and more interactive teaching methods." Traditional learning methods that rely on one-way instruction are becoming less relevant in preparing students for professional challenges. According to Yandi, Putri, and Putri (2023), student learning outcomes are influenced by various factors, including motivation, learning environment, teaching methods, and support from family and school.

Improving student learning outcomes is a primary goal in education, but its achievement often faces various challenges. One of the main obstacles is the lack of active student engagement in the learning process, especially in conventional methods that are still widely implemented. One-way learning tends to make students passive, less motivated, and struggle to develop critical thinking and problem-solving skills. Additionally, differences in learning styles, limited facilities, and instructors' readiness to adapt innovative methods also affect learning effectiveness. The implementation of more interactive methods, such as CBL and PBL, is expected to address these challenges by providing a more contextual, applicable, and engaging learning experience. However, its application also requires the right strategy to optimize student learning outcomes effectively. Students often struggle to deeply understand concepts when learning is solely focused on lectures or passive approaches. One-way learning processes frequently result in low student engagement, limiting their comprehension of the material.

Case-Based Learning (CBL) is an approach that places students in real-life situations through case studies relevant to the learning material. Asep et al. (2023) stated that "the application of the case method in geography learning can enhance student interaction and participation, as well as deepen their understanding of anthropological concepts through real-world situation analysis." CBL plays a crucial role in increasing student engagement by encouraging them to think critically, engage in discussions, and evaluate various perspectives in solving a problem. Additionally, CBL strengthens collaboration and communication among students as it is often implemented in group discussions. This approach not only deepens students' understanding of the material but also fosters social and teamwork skills that are essential in the workplace. Therefore, the effective implementation of CBL can significantly contribute to improving student learning outcomes. Through this approach, students do not only understand concepts theoretically but also learn to apply them in real-world contexts. CBL has been widely used in fields such as law, medicine, and business due to its effectiveness in training analytical and decision-making skills. However, its implementation in other disciplines still requires further study to determine the extent to which this method can improve student learning outcomes across various fields of study.

Project-Based Learning (PBL) is an approach that positions students as the main actors in the learning process through the completion of projects relevant to real-world scenarios. PBL is designed to enhance both conceptual understanding and practical skills by encouraging students to apply theory in real-life contexts. Susanti (2023) stated that "project-based learning methods can have a positive impact on students' academic achievement, allowing them to engage more actively and understand material in a more contextual way." One of the primary roles of PBL is

to increase student engagement by providing challenges that require independent and collaborative problem-solving. Amelia and Aisya (2021) noted that the project-based learning model can enhance students' critical thinking and creativity. In this process, students not only gain a deeper understanding of the material but also develop critical thinking, creativity, communication, and time management skills. Additionally, PBL helps students build teamwork and leadership skills, as projects are often carried out in groups. This approach is also more flexible and adaptive to industry needs, making students better prepared to face the dynamic professional world. PBL is a teaching method that involves students in long-term projects that require them to design and develop real solutions to a given problem. This approach not only helps students gain a deeper understanding of concepts but also encourages them to apply knowledge in practical contexts. Furthermore, PBL develops collaborative skills, creativity, and critical thinking abilities—essential competencies in the workplace. According to Widiyanti and Toin (2021), project-based learning has been proven effective in enhancing students' creativity, particularly in learning environments that require adaptability. By working in teams and facing real-world challenges, students become better equipped to handle complex problems in their respective fields of expertise.

Although many studies have discussed the effectiveness of various learning methods, there remains a gap in understanding the direct comparison between CBL and PBL in improving student learning outcomes. Most previous studies have focused more on the implementation of each method separately, without highlighting the strengths and limitations of both within the same research framework. This gap creates the need for a comparative study that can provide a clearer picture of which method is more effective in enhancing students' understanding, analytical skills, and engagement in learning. By comparing CBL and PBL within a single study, this research aims to identify the more optimal method for improving learning outcomes while providing evidence-based recommendations for educators and educational institutions in selecting the most suitable teaching strategies for students' needs. Irawati, Ilhamdi, and Nasruddin (2021) stated that "learning styles have a significant influence on learning outcomes; thus, by understanding students' learning styles, educators can design more effective and student-centered teaching strategies." Through this comparative study, it is expected that deeper insights will be gained on how both methods contribute to academic learning and how certain factors—such as engagement levels, problem-solving, and the application of theory to practice—can serve as indicators of success in experience-based learning.

Several studies indicate that CBL is more effective in developing analytical and decision-making skills, while PBL is better suited for enhancing practical and collaborative abilities. However, the effectiveness of these methods may vary depending on the academic context and students' characteristics. Mea (2024) stated that "the effectiveness of learning can be improved through teachers' creativity and innovation in creating dynamic classrooms, allowing students to be more engaged and actively participate in the learning process." Therefore, a more in-depth comparative study is needed to evaluate the strengths and weaknesses of each method across different disciplines. This study aims to compare the effectiveness of CBL and PBL in improving student learning outcomes. It seeks to address the challenges of conventional teaching methods, which are often less interactive and ineffective in fostering critical thinking and problem-solving skills. Furthermore, this study seeks to evaluate the effects of both approaches on student engagement and motivation throughout the learning process. The results are anticipated to offer valuable recommendations for educators and academic institutions in choosing more effective instructional strategies and preparing students for a highly competitive job market.

METHOD

This study aims to compare the effectiveness of Case-Based Learning (CBL) and Project-Based Learning (PBL) in improving students' learning outcomes. The research employs both quantitative and qualitative approaches. This study adopts a quasi-experimental design with pre-tests and post-tests conducted on two student groups. The research subjects consist of 60 sixth-semester students from the Educational Technology Study Program at Universitas Negeri Makassar, divided into two groups: the CBL group (30 students) and the PBL group (30

students). Quantitative data is collected through pre-test and post-test assessments, which include questions focusing on conceptual understanding and theoretical application. Meanwhile, qualitative data is gathered through observations and semi-structured interviews to explore students' engagement and experiences during the learning process.

Before the main data collection, the research instruments were tested for validity and reliability. Content validity was assessed through expert judgment, while construct validity was examined using exploratory factor analysis (EFA). Reliability testing was conducted using Cronbach's Alpha (≥ 0.7) and split-half reliability to measure the internal consistency of the instruments. Quantitative data were analyzed using descriptive and inferential statistics, including an independent sample t-test to determine whether there was a significant difference in students' learning outcomes between the CBL and PBL methods. Meanwhile, qualitative data were analyzed using thematic analysis techniques to identify key patterns in students' responses regarding the effectiveness of each learning method. The findings of this study are expected to provide empirical insights into the advantages and challenges of implementing CBL and PBL, serving as recommendations for lecturers in selecting more effective teaching strategies. Research results are presented in tables and graphs to facilitate interpretation and provide more accurate conclusions regarding the effectiveness of both learning methods in enhancing students' learning outcomes.

RESULT AND DISCUSSION

This study was conducted to compare the effectiveness of Case-Based Learning (CBL) and Project-Based Learning (PBL) in improving students' learning outcomes. The data analysis results indicate that both methods positively impact learning outcomes, albeit with different levels of effectiveness. During the pre-test stage, both student groups had similar average scores, with a mean score of 66 for the CBL group and 64 for the PBL group. This indicates that the initial abilities of students in both groups were relatively equivalent before the instructional intervention. After implementing each method for one semester, a post-test was conducted to measure the improvement in learning outcomes. The results showed that students taught using the CBL method achieved an average score of 78, while those in the PBL group attained an average score of 84. This difference suggests that students who learned through PBL experienced a more significant improvement in learning outcomes compared to those in the CBL group. Statistical analysis using an independent sample t-test revealed a p-value < 0.05, indicating a significant difference between the learning outcomes of both groups. This finding suggests that the PBL method is more effective than CBL in enhancing student learning outcomes.

Students who engaged in Case-Based Learning (CBL) felt that this approach helped them sharpen their analytical and problem-solving skills through real-world case studies. They became more adept at linking theory to practice and gained confidence in constructing arguments based on data and concepts they had learned. However, some students expressed that discussions in CBL were sometimes less in-depth if they lacked sufficient prior understanding of the case material provided. On the other hand, students who participated in PBL demonstrated higher engagement in the learning process. They were more active in exploring the material, collaborating in teams, and applying the concepts they had learned to real-world projects. PBL also enhanced students' creativity and critical thinking skills, as they were required to develop concrete solutions to the problems they encountered. Ilmudinulloh (2022) stated that the implementation of project-based learning has the potential to improve critical thinking skills among students. Observations during the learning process revealed that students using the PBL method were more engaged in group discussions, showed greater initiative in completing tasks, and exhibited higher enthusiasm in applying theoretical knowledge to real-life practice.

Nevertheless, several challenges were encountered in the implementation of PBL. Some students struggled with time management and team coordination, especially in projects that required intensive collaboration. Additionally, students who were less accustomed to self-directed learning faced difficulties in effectively finding supplementary information. Overall, PBL tended to enhance student engagement and understanding in a more applied context,

whereas CBL was more effective in strengthening analytical and problem-solving skills. These findings support the quantitative results, which indicate that students in the PBL group experienced a more significant improvement in learning outcomes compared to those in the CBL group.

1: Comparison of Learning Outcomes Between CBL and PBL Methods

Group	**Number of Students (N)**	**Pre-Test Mean (SD)**	**Post-Test Mean (SD)**	**Improvement (%)**	**Significance (p-value)**
CBL	30	66.00 (4.0)	78.00 (3.8)	18.2%	0.004*
PBL	30	64.00 (4.2)	84.00 (3.5)	31.3%	0.001*

Notes:
N = Number of students in the group
SD = Standard Deviation
p-value < 0.05 indicates a significant difference
Interpretasi Tabel:

1. The PBL group experienced a higher learning improvement (31.3%) compared to the CBL group (18.2%).
2. The post-test scores of students in the PBL group (84.00 ± 3.5) were higher than those in the CBL group (78.00 ± 3.8).
3. The t-test results indicated a notable distinction between the two learning methods (p = 0.001 for PBL and p = 0.004 for CBL).
4. These results indicate that while both PBL and CBL contribute significantly to enhancing student learning outcomes, PBL proves to be the more effective approach.
5. Interview and observation results support the quantitative data, showing that students in the PBL group were more active in exploring materials, engaging in discussions, and applying theories in real-world contexts.

This table provides a quantitative overview of the effectiveness of both learning methods and serves as a foundation for recommending more optimal teaching strategies to enhance student learning outcomes.

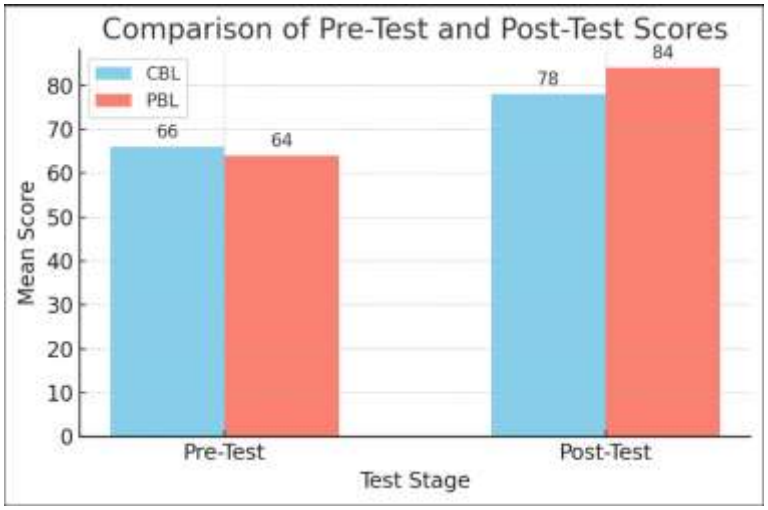

Figure 1: Comparison of Pre-Test and Post-Test Scores Between CBL and PBL Methods

Both CBL and PBL contribute positively to the improvement of students' learning outcomes, but with different levels of effectiveness. In the pre-test stage, the average scores of students in the CBL and PBL groups were not significantly different, at 66.00 and 64.00, respectively. This indicates that the initial abilities of both groups were relatively equal before the learning treatments were applied. After one semester of implementing the learning methods, the post-test results showed that students who learned using the PBL method experienced a

higher improvement in learning outcomes compared to the CBL group. The average post-test score for the CBL group was 78.00, with an increase of 18.2%, while the PBL group achieved an average score of 84.00, with an increase of 31.3%. Statistical analysis using the independent sample t-test showed a p-value of < 0.05, indicating a significant difference between the learning outcomes of students using the PBL and CBL methods.

PBL allows students to be more actively engaged in exploring real-world problems, applying theoretical concepts in practice, and collaborating to find solutions. On the other hand, although CBL has also been proven to improve students' learning outcomes, its effectiveness is lower compared to PBL. This may be due to the nature of CBL, which still relies on analyzing pre-provided cases, leading students to focus on problem-solving within a more limited scope. Conversely, PBL gives students greater freedom to explore various possible solutions, making them more actively involved in the learning process. However, there are several challenges in implementing PBL, such as the need for more intensive guidance from lecturers and a longer time allocation to complete projects. These factors should be considered by educational institutions when designing a PBL-based curriculum to ensure its effectiveness and efficiency.

CONCLUSION

The results of this study indicate that both Case-Based Learning (CBL) and Project-Based Learning (PBL) can improve student learning outcomes, but with different levels of effectiveness. PBL has been proven to be more effective, with a learning outcome increase of 31.3%, compared to CBL, which only showed an 18.2% improvement. Statistical analysis reveals a significant difference between the two methods, where students who learned through PBL achieved higher results than those who learned through CBL. These findings suggest that PBL is more effective in enhancing critical thinking skills, problem-solving abilities, and student engagement in the learning process. Therefore, the implementation of PBL in courses that require applied skills is recommended to be further optimized. The implications of this study highlight the need for more innovative learning strategies to maximize student learning outcomes. Educational institutions may consider integrating PBL more broadly into the curriculum while ensuring that both students and lecturers are adequately prepared to implement this method effectively. Future research could further explore factors influencing PBL effectiveness, such as the role of lecturer facilitation, project complexity levels, and its long-term impact on students' skills in the workforce. Additionally, further studies could compare the effectiveness of PBL across different disciplines to gain more comprehensive findings.

REFERENCES

Amelia, N., & Aisya, N. (2021). Project-Based Learning Model and Its Application for Early Childhood Education at TK IT Al-Farabi. Buhuts Al-Athfal: Journal of Early Childhood Education, 1(2). https://doi.org/10.24952/alathfal.v1i2.3912

Asep, A., Helmi, D., Ansiska, P., & Sohilait, D. (2023). Learning Activities Based on Case Method in Geography Learning in Anthropology Course. Jurnal Ilmiah Profesi Pendidikan, 8(1b), 515–522. https://doi.org/10.29303/jipp.v8i1b.1216

Ilmudinulloh, R. (2022). Project-Based Learning Model to Develop Students' Critical Thinking Skills. Jurnal Riset Jurnalistik dan Media Digital (JRJMD), 2(2). https://doi.org/10.29313/jrjmd.v2i2.1366

Irawati, I., Ilhamdi, M. L., & Nasruddin, N. (2021). The Effect of Learning Styles on Science Learning Outcomes. Jurnal Pijar Mipa, 16(1), 44–48. https://doi.org/10.29303/jpm.v16i1.2202

Khofifah, K., Putri, N. R., Jannah, F., & Astuti, N. Y. (2024). The Role of Technology in Enhancing the Effectiveness of Islamic Education Learning. Jurnal Pendidikan Islam Al-Affan, 4(2). https://doi.org/10.69775/jpia.v4i2.215

Mea, F. (2024). Enhancing Learning Effectiveness through Teacher Creativity and Innovation in Creating a Dynamic Classroom. Inculco Journal of Christian Education, 4(3). https://doi.org/10.59404/ijce.v4i3.190

Susanti, R. (2023). The Effect of Project-Based Learning Method on Mathematics Achievement of Elementary School Students. Jurnal Review Pendidikan Dan Pengajaran, 6(4), 3997–

4007. https://doi.org/10.31004/jrpp.v6i4.23266

Utomo, F. T. S. (2023). Innovation in Interactive Learning Media to Enhance Learning Effectiveness in the Digital Era in Elementary Schools. Pendas: Jurnal Ilmiah Pendidikan Dasar, 8(2). https://doi.org/10.23969/jp.v8i2.10066

Widiyanti, S., & Toin, D. R. Y. (2021). The Effectiveness of Project-Based Learning in Enhancing Student Creativity During the COVID-19 Pandemic. Jurnal Ilmiah IT Cida: Diseminasi Teknologi Informasi, 7(1). https://dx.doi.org/10.55635/jic.v7i1.135

Yandi, A., Nathania Kani Putri, A., & Syaza Kani Putri, Y. (2023). Factors Influencing Student Learning Outcomes: A Literature Review. Jurnal Pendidikan Siber Nusantara, 1(1), 13–24. https://doi.org/10.38035/jpsn.v1i1.14