Implementation of Case Method and Team-Based Project Learning Models in the Basic Concepts of PLS Course to Support the OBE Curriculum in the Community Education Department, Unimed

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Abstract. The purpose of this study is to describe the implementation of case method and team-based project in learning Basic Concepts of Community Education, to test the effectiveness of case method and team-based project learning models on improving 4 student literacies as contained in the Outcome Based Education (OBE) curriculum. This type of research is Mixed Method Research (MMR) which describes the implementation of learning models qualitatively and describes the effectiveness of learning models quantitatively. The implementation of the Case Method and Team Based Project Learning Models has been successfully applied to the Basic Concepts of PLS Course in the Community Education Department of Unimed to support the OBE Curriculum. The results of the normality test showed that the pretest data were normally distributed according to both the Kolmogorov-Smirnov and Shapiro-Wilk tests, while the posttest data showed slightly different results but could still be considered normal for further analysis. The paired T-test showed a significant increase between the pretest scores (average 65.9333) and posttest (average 82.2333), with a significance value of 0.000 (<0.05).

Keywords: Case Method, Team-based Project, OBE.

1 Introduction

With the advancement of Industry 4.0, which has subsequently given rise to Education 4.0, outcome-based education (OBE) has become a fundamental requirement in contemporary education management. The government has mandated that higher education institutions implement curricula based on the principles of Outcome-Based Education. OBE is inherently achievement-oriented, shifting the educational focus beyond merely covering content to emphasizing the attainment of clearly defined learning outcomes. In essence, this curriculum underscores the continuity of the learning process in an innovative, effective, and interactive manner, enabling students to develop new competencies that prepare them for success in a global context.

Outcome-Based Education (OBE) is a pedagogical framework that forms the foundation of educational systems aiming to achieve specific educational objectives or outputs. As such,

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graduates are expected to attain predetermined competencies upon completion of their studies. In contrast to previous curricula that primarily emphasized inputs and processes, OBE also prioritizes the assessment of established learning outcomes and achievements [1].

Learning itself is conceptualized as an interactive process between lecturers and students during instructional activities. The approaches adopted by lecturers significantly influence students' engagement and learning outcomes. Among the various elements that can support effective learning, the selection and application of appropriate learning models play a crucial role. The successful implementation of learning strategies is highly dependent on the methods and models employed by lecturers, as instructional strategies are typically operationalized through specific learning models [2][3][4].

The implementation of the case method and team-based projects represents a novel approach within university learning processes. The adoption of these methods is formally articulated in the Decree of the Minister of Education and Culture of the Republic of Indonesia Number 3/M/2021, which addresses the Key Performance Indicators (KPIs) for State Universities and Higher Education Service Institutions under the Ministry of Education and Culture. These KPIs are designed to enhance the quality of education and produce graduates who are highly competent and able to compete effectively in the workforce and industry.

Both the case method and team-based project approaches are explicitly included under Key Performance Indicator Number 7 (IKU-7). The primary objective of implementing these two methods is to develop students' critical thinking and practical skills, while simultaneously requiring educators to possess and demonstrate advanced competencies [5].

A preliminary study was conducted by the proposer in the Department of Community Education at the State University of Medan. The proposer carried out interviews with several lecturers and students and observed the implementation of teaching and learning processes in the introductory courses on Community Education (PLS). The findings revealed that the learning models currently employed do not sufficiently stimulate students' critical thinking as envisioned by the Outcome-Based Education (OBE) framework. Students also reported that lecturers have not yet fully implemented the case method and team-based project models in their teaching.

Further observations of the learning evaluation sheets prepared by lecturers indicated that these assessments do not yet reflect the achievement of learning outcomes aligned with OBE standards. The proposer also analyzed students' academic performance by reviewing final exam answer sheets and conducting additional interviews to assess learning outcomes. The results showed that students' critical thinking skills had not developed adequately, rendering them unable to provide concrete solutions to issues related to the fundamentals of non-formal education.

According to Ali Nurman et al., the case method and team-based learning are intended to enhance students' critical thinking abilities, enabling them to solve concrete problems, identify solutions, and develop both skills and communication competence. In other words, if the case method and team-based project learning models are properly implemented, students' academic outcomes can be expected to align with the achievement standards set by OBE [6].

The Case Method Learning Model is an instructional approach that prioritizes the use of case studies as a means to develop students' critical thinking and problem-solving abilities. In this model, students are presented with real-world or complex simulated scenarios that mirror challenges they may encounter in their future professional environments. The primary objective of this method is to cultivate students' analytical skills, decision-making capabilities, and critical thinking in situations characterized by ambiguity and the absence of definitive answers.

Throughout the learning process, students engage not only with theoretical knowledge but also actively participate in discussions, debates, and group collaborations to explore diverse perspectives and formulate solutions to the problems posed in the case studies. This approach is particularly effective in fostering higher-order thinking skills, such as synthesizing information, evaluating arguments, and formulating practical solutions. Moreover, by increasing their active participation in group discussions, students also enhance their teamwork, communication, and interpersonal skills.

In the context of higher education, the application of the case method is highly relevant to the Outcome-Based Education (OBE) curriculum model, as it emphasizes the achievement of learning outcomes focused on practical skills and real-world application of knowledge [7].

The Team-Based Project (TBP) model, on the other hand, emphasizes collaboration among students working in groups to complete complex tasks or projects. In this approach, students collaborate to plan, develop, and execute projects that are often grounded in real-world contexts or problems. Each team member assumes specific roles, enabling the distribution of responsibilities and the optimization of individual strengths to achieve collective objectives. The principal advantages of this learning model include the development of collaboration, communication, and managerial skills. Through the experience of working in teams, students learn to integrate multiple perspectives, resolve conflicts, and manage both time and resources effectively [8].

The central concept of Outcome-Based Education (OBE) is the focus on learning outcomes. These outcomes refer to the knowledge, skills, and attitudes that learners are expected to master or demonstrate upon completing a particular unit, course, or study program. OBE systematically aligns various educational elements to facilitate the attainment of these outcomes by learners. These elements include the learning outcomes themselves, curriculum design, instructional methods, assessment strategies, continuous quality improvement, and all supporting resources, such as faculty, physical facilities, information systems, governance structures, and institutional management [9].

Based on the introduction and literature review conducted, the proposer argues that it is necessary to study the implementation of the case method and team-based project learning models within the instructional process. This investigation should not be limited solely to teaching and learning activities, but should also encompass students' learning attitudes, the use of learning media, and the evaluation of learning outcomes—all of which are essential to achieving the objectives outlined by OBE. Accordingly, the proposed research is entitled, "Implementation of Case Method and Team-Based Project Learning Models in the Basic Concepts of the PLS Course to Support the OBE Curriculum in the Community Education Department at Unimed."

2 Research Method

The research approach employed in this study is Mixed Method Research (MMR). The MMR design adopted is the exploratory design. According to Creswell (2015), an exploratory design is implemented in two sequential phases: the first phase involves the collection of qualitative data, which is subsequently followed by the collection of quantitative data in the second phase. The findings from the qualitative analysis in the initial phase are utilized to guide the focus, type, and instruments for quantitative data collection. This design is particularly

advantageous when researchers need to explore a phenomenon in depth through qualitative inquiry before confirming and validating the findings with quantitative analysis [10].

In accordance with the principles of MMR, this study seeks to obtain a deeper and more comprehensive understanding of the phenomenon under investigation by first utilizing qualitative data to explore the context in detail, followed by quantitative data to test and confirm the findings. This approach is consistent with the objectives of exploratory design, which enables researchers to develop initial theories or hypotheses that can be systematically tested during the quantitative phase [11].

3 Results and Discussion

3.1 Implementation Case Method and Team Based Project Learning Models in the Basic Concepts of PLS Course to Support the OBE Curriculum

In the initial meeting, the lecturer provided a comprehensive introduction to the Basic Concepts of PLS course. It was explained that the course would employ the Case Method and Team-Based Project approaches, both of which are aligned with the Outcome-Based Education (OBE) curriculum. The lecturer outlined the learning objectives as specified in the course syllabus (RPS), emphasizing that by the end of the semester, students are expected to be able to describe the development and evolution of PLS in Indonesia, analyze the underlying philosophy and principles of PLS, and formulate solutions to issues related to PLS in the Indonesian context.

The assessment system is explained in detail, encompassing components such as participation in discussions, case analyses, mini-research projects, idea development, and a final project. The lecturer underscores the importance of regular attendance and active participation in every lecture session. Students are then assigned to small groups that will collaborate throughout the semester on both case analyses and team-based projects. The formation of these groups takes into account the diversity of students' backgrounds and abilities, thereby ensuring productive and dynamic teamwork.

To assess students' initial understanding, the lecturer administered a pre-test containing questions on the basic concepts of PLS, the history of its development in Indonesia, and contemporary issues related to PLS. The pre-test also included items regarding students' expectations for the course and their prior experiences with PLS. Additionally, the lecturer conducted a survey to identify students' interests and to determine specific areas within PLS that they find particularly engaging.

The cases utilized reflect various aspects of PLS as outlined in the course syllabus (RPS), ranging from the implementation of literacy programs to community empowerment initiatives. These cases are specifically designed to challenge students to apply the theoretical concepts they have learned to real-world situations. The team-based projects require students to implement fundamental PLS concepts within the context of local communities. Students are encouraged to engage directly with the community, identify educational needs, and design solutions based on PLS principles.

3.2 Ability Student Before Follow Case Method and Team Based Project Learning Models in the Basic Concepts of PLS Course for Support OBE Curriculum

The pre-test results from 30 students revealed a highest score of 84, a lowest score of 48, an average score (M) of 64.13, and a standard deviation (SD) of 10.05. The frequency distribution of pre-test scores is presented in Table 1 below.

Table 1. Frequency Distribution of Pre-test Scores

Class	Class Interval	Absolute Frequency	Frequency Relative (%)
1	48 -- 54	4	13.33
2	55 -- 60	5	16.67
3	61 -- 66	8	26.67
4	67 -- 72	4	13.33
5	73 -- 78	5	16.67
6	79 -- 84	4	13.33
		30	100

The pre-test frequency distribution data for the experimental class (Table 1) can be described based on the predetermined interval classes and the observation frequencies obtained from the research are shown in Figure 1 below.

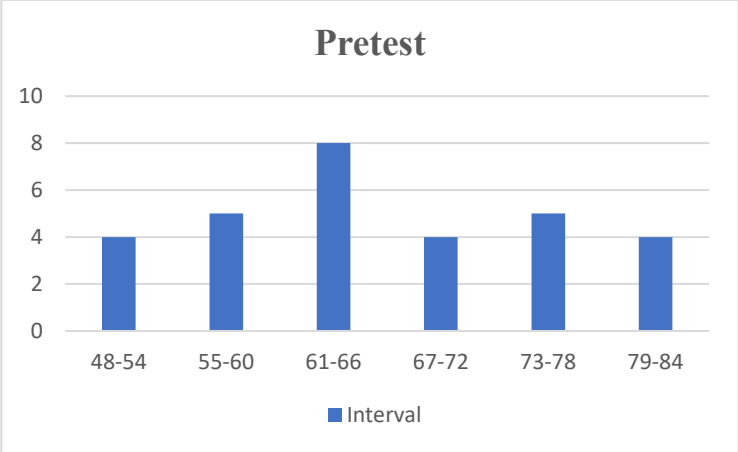

Fig. 1. Frequency distribution data diagram of the experimental class pre-test

The frequency distribution shows that there are 6 classes of Student value intervals. There are 4 students who get the minimum score, namely in the class range of 48-54, then in the middle value, namely the range of 61-66, there are 8 students and there are 4 students who are in the interval of 79-84 which is the highest value range in the pre-test in this study.

3.3 Student Abilities After Following the Case Method and Team Based Project Learning Models in the Basic Concepts of PLS Course to Support the OBE Curriculum.

Post-test results on 30 people Student obtained mark highest = 92, value lowest = 60, average value (M) = 79.2, and Standard Deviation (SD) = 9.15.

Table 2. Frequency Distribution of Students' Post-test Scores

Class	Class Interval	Absolute Frequency	Frequency Relative (%)
1	60 -- 65	1	3.33
2	66 -- 71	1	3.33
3	72 -- 77	7	23.33
4	78 -- 83	6	20
5	84 -- 89	5	16.67
6	90 -- 95	10	33.33
		30	100

The distribution of post-test frequencies of the experimental class can be described based on the predetermined interval classes and the observation frequencies obtained from the research are shown in Figure 2 below.

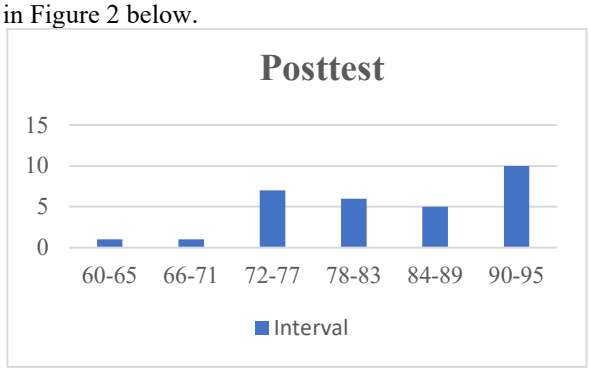

Fig. 2. Post-test Frequency Distribution Data Diagram of Experimental Class

The highest concentration of post-test scores falls within the 90–95 interval, indicating that this range contains the largest number of students (10 individuals). The corresponding frequency distribution diagram visualizes the spread of post-test scores, demonstrating a significant improvement compared to the pre-test results, with the majority of scores now falling within the upper range (90–95).

The distribution diagram shows that there are six score interval classes among the students. One student achieved the minimum post-test score, which falls within the 60–65 interval. In the mid-range, specifically within the 78–83 interval, there are six students, while the highest interval, 90–95, comprises ten students—the largest group in the post-test results for this study.

When comparing pre-test and post-test scores, a clear improvement is observed. The lowest pre-test score was 48, while the lowest post-test score increased to 60. Similarly, the highest pre-test score was 84, whereas the highest post-test score reached 92.

3.4 Normality Test

A normality test was conducted on two groups of data: the pretest and posttest, each consisting of 30 samples. To assess data normality, both the Kolmogorov-Smirnov and Shapiro-Wilk methods were employed. The Kolmogorov-Smirnov test results indicated that both the pretest and posttest data were normally distributed, with significance values of 0.200 for the pretest and 0.103 for the posttest—both greater than the 0.05 threshold. This suggests that the data distributions do not significantly deviate from normality.

However, the Shapiro-Wilk test produced slightly different results. While the pretest data continued to show normal distribution with a significance value of 0.484 (> 0.05), the posttest data yielded a significance value of 0.013 (< 0.05), indicating a departure from normality. The discrepancy between the two tests may be attributed to differences in their sensitivity, as the Shapiro-Wilk test is generally more sensitive for smaller sample sizes.

Despite this minor inconsistency, the results are still considered adequate for proceeding with parametric analysis, particularly since the paired t-test is robust against mild violations of normality assumptions. The detailed results of the normality tests are presented in Table 3 below.

Table 3. Normality Results

Case Processing Summary

	Class	Cases					
		Valid		Missing		Total	
		N	Percent	N	Percent	N	Percent
Results	Pretest A	30	100.0%	0	0.0%	30	100.0%
	Posttest A	30	100.0%	0	0.0%	30	100.0%

Tests of Normality

	Class	Kolmogorov-Smirnov [a]			Shapiro Wilk		
		Statistics	df	Sig.	Statistics	df	Sig.
Results	Pretest A	,122	30	,200 *	,968	30	,484
	Posttest A	,146	30	,103	,908	30	,013

*. This is a lower bound of the true significance.
a. Lilliefors Significance Correction

Normal QQ Plot graph is used to visually assess the normality of data. In the given data , there are two Normal QQ Plot graphs , one for pretest data and one for posttest data.

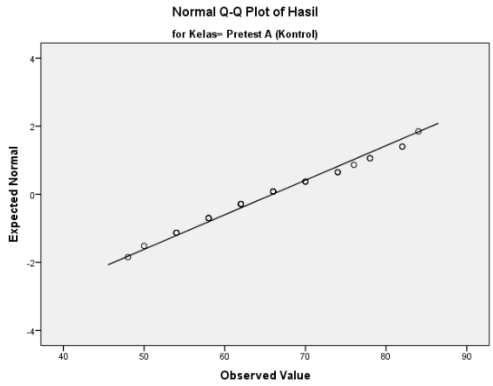

Fig. 3. Chart Normality Pretest

This chart illustrates a distribution of data points that closely follow the diagonal line, indicating a general adherence to the pattern expected under normality. The data points are distributed fairly close to the straight diagonal line running from the lower left to the upper right, suggesting that the pretest data are approximately normally distributed. While a few points deviate slightly from the diagonal—particularly near the center of the graph—these deviations are not substantial. Overall, the pattern demonstrates good linearity and further supports the assumption of normality for the pretest data.

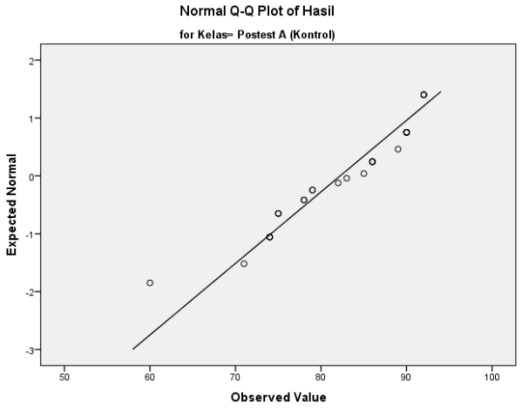

Fig. 4. Chart Normality Posts

In the posttest Q-Q plot, the distribution of points also tends to follow the diagonal line, although the spread appears slightly greater compared to the pretest graph. Most data points remain close to the diagonal, particularly in the middle of the graph; however, a few points at the upper and lower extremes deviate somewhat from the diagonal line. This deviation is more pronounced than in the pretest graph, which may account for the differing results observed in the Shapiro-Wilk test for the posttest data.

Overall, both Normal Q-Q Plots support the assumption of normality, especially for the pretest data. While the posttest graph exhibits minor deviations, it still aligns closely enough with the expected pattern to be considered sufficiently normal for the purposes of parametric

statistical analysis. This visual interpretation is consistent with the results of the Kolmogorov-Smirnov test, which indicated normality for both data sets. Although the posttest graph shows some deviation, it is not substantial enough to warrant outright rejection of the normality assumption.

Thus, the combination of visual and statistical evidence provides a solid foundation for proceeding with parametric analysis, such as the paired t-test. However, it remains important to consider these minor deviations in interpreting the final results, and the use of non-parametric tests may be considered as a supplementary analysis if necessary.

Based on the research findings, several key points can be discussed to evaluate the effectiveness of implementing the Case Method and Team-Based Project learning models in supporting the Outcome-Based Education (OBE) curriculum within the Basic Concepts of PLS course at the Community Education Department, Unimed.

The implementation of these learning models was successfully carried out and aligned well with the objectives of the OBE curriculum, which emphasizes the achievement of student learning outcomes. The findings indicate that integrating case-based and team project approaches effectively supports the development of students' practical skills, which are essential in outcome-based education. The use of these methods fosters a more hands-on, interactive, and collaborative learning environment, consistent with the goals of OBE to ensure that students not only master the material but also develop problem-solving skills that can be applied in real-world contexts [12][13].

However, although the implementation of these learning models was largely successful, the normality test results indicate some differences in the distribution of the posttest data, even though these remain within acceptable limits for further statistical analysis. This suggests that, while the data are suitable for statistical evaluation, there may be external factors or other variables influencing the distribution of student learning outcomes. These factors could include variations in students' understanding of the material, as well as differences in how lecturers implement these learning methods [14].

A significant improvement was observed between the pretest and posttest scores, with a significance value of 0.000 (< 0.05), indicating that the implementation of the Case Method and Team-Based Project learning models had a positive impact on students' learning outcomes. This improvement is particularly important as it demonstrates the effectiveness of these methods in enhancing students' ability to understand and apply the concepts taught in the Basic Concepts of PLS course. Although the improvement is statistically significant, the average posttest score (82.23) still indicates that there is room for further enhancement, especially in striving to achieve the optimal goals of OBE [15].

Additionally, the N-Gain test results indicated an improvement of 43.65%, suggesting that while there was a substantial increase, the effectiveness of the learning models can still be further enhanced. The improvement, which falls within the "medium" category, demonstrates that although the models are reasonably effective, there remain aspects that require attention and refinement. These include the implementation of the learning models, the quality of the instructional materials, and the methods by which students interact within project teams and case studies. For instance, it may be necessary to further strengthen team collaboration or provide more structured feedback from lecturers to help students better understand and overcome the challenges they encounter during the learning process [16].

Overall, although the Case Method and Team-Based Project learning models have demonstrated strong potential in supporting the OBE curriculum, there remains room for further refinement. Improvements could include enhancing lecturers' teaching techniques, selecting more relevant and in-depth case studies, and further optimizing evaluation methods that focus

on students' skill attainment. With ongoing improvements and development, these learning models are expected to become even more effective in preparing students to meet the challenges of the global workforce and industry, in line with the primary objectives of the OBE curriculum [17].

3.5 Hypothesis Testing

To examine the effect of implementing the Case Method and Team-Based Project models in the Basic Concepts of Non-Formal Education (PLS) course, a paired t-test was conducted. This test was used to compare the mean pretest and posttest scores in order to evaluate whether there was a significant difference following the implementation of these learning models. The results of the paired t-test are presented in Table 4 below.

Table 4. Results of paired t-test .

Paired Samples Statistics

		Mean	N	Std. Deviation	Std. Error Mean
Pair 1	Before given treatment	65,9333	30	9.84687	1.79778
	After given treatment	82.2333	30	8.09292	1.47756

Paired Samples Correlations

		N	Correlation	Sig.
Pair 1	Before given Treatment & After given treatment	30	,199	,291

Paired Samples Test

		Paired Differences					t	df	Sig. (2-tailed)
		Mean	Std. Deviation	Std. Error Mean	95% Confidence Interval of the Difference				
					Lower	Upper			
Pair 1	Before given treatment - After given treatment	-16,300	11,432	2,0872	-20,56893	-12,037	-7,809	29	,000

The analysis results reveal a highly significant difference between the pretest and posttest scores. The average pretest score was 65.93, while the average posttest score increased to 82.23. This improvement indicates a positive impact resulting from the implementation of the applied learning models. The t-value of -7.809, with a significance level of 0.000 (well below 0.05), provides strong statistical evidence that this difference is highly significant. These findings demonstrate that the implementation of the Case Method and Team-Based Project Learning Models has successfully enhanced students' understanding and performance in the Basic Concepts of PLS course. The increase in the average score by 16.3 points (from 65.93 to 82.23) further illustrates the effectiveness of these learning models in improving student learning outcomes. Moreover, this result indicates that the applied learning approaches have effectively

supported the achievement of learning objectives within the framework of the Outcome-Based Education (OBE) curriculum.

3.6 N Gain Test

To assess the effectiveness of the implementation of the Case Method and Team-Based Project Learning Models, the N-Gain test was conducted. This test provides an indication of the improvement in students' learning outcomes relative to the maximum possible score that could be achieved. The results of the N-Gain test are presented in Table 5 below.

Table 5. N-Gain test results

Descriptive Statistics					
	N	Minimum	Maximum	Mean	Std. Deviation
Gain_Score	30	-,61	,85	,4365	,32953
Gain_Percent	30	-61.11	84.62	43.6456	32.95327
Valid N (listwise)	30				

The results of the N-Gain test indicate an average N-Gain score of 0.4365, or 43.65%. According to Hake's classification, an N-Gain value between 0.3 and 0.7 falls within the moderate category. This suggests that the implementation of the learning models resulted in a substantial improvement in learning outcomes. An increase of 43.65% demonstrates that nearly half of the maximum potential improvement has been achieved. These findings indicate that the Case Method and Team-Based Project Learning Models are quite effective in enhancing students' understanding and skills in the Basic Concepts of PLS course.

Furthermore, this N-Gain value reflects the successful implementation of the OBE curriculum, which emphasizes the achievement of measurable learning outcomes. The moderate increase signifies that the applied learning models have effectively facilitated students in attaining the expected learning outcomes.

4 Conclusion

Based on the results of this study, the implementation of the Case Method and Team-Based Project Learning Models in the Basic Concepts of PLS course at the Unimed Community Education Department has proven effective in supporting the Outcome-Based Education (OBE) curriculum. The normality tests indicated that the pretest data were normally distributed according to both the Kolmogorov-Smirnov and Shapiro-Wilk tests, while the posttest data showed slight deviations but remained sufficiently normal for further analysis. The paired t-test revealed a significant increase in student performance, with average scores rising from 65.93 (pretest) to 82.23 (posttest), and a significance value of 0.000 (< 0.05), demonstrating a positive impact of the applied learning models on student outcomes.

Additionally, the N-Gain test showed an average increase of 43.65%, classified as "moderate," indicating that the learning models are reasonably effective in enhancing students' understanding and skills. Nonetheless, the Case Method and Team-Based Project learning

models still offer potential for further refinement to optimize their effectiveness in supporting the objectives of the OBE curriculum and improving overall learning quality.

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