

THE EFFECT OF THE PROJECT BASED LEARNING (PjBL) MODEL ON THE LEARNING OUTCOMES OF STUDENTS OF PUBLIC ELEMENTARY SCHOOL 141 PEKANBARU

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ABSTRACT

The use of less diverse and teacher-centered teaching methods frequently explains students' poor learning outcomes concerning Indonesian cultural diversity in primary education. This research seeks to ascertain how fourth-grade pupils at SD Negeri 141 Pekanbaru acquire knowledge through the Project Based Learning (PjBL) approach. This research used a quasi-experimental design with a non-equivalent control group. The 35 students in the research sample were divided into two groups: the experimental class, which had 17 students utilising the PjBL methodology, and the control class, which had 18 students using conventional teaching methods. Pretests and posttests that assessed cognitive learning outcomes were used to collect data. An independent samples t-test was used to analyse the data after the completion of the required tests for homogeneity and normality. According to the study, the experimental group's average posttest score was 83.82, significantly higher than the control group's score of 58.89. The results of the hypothesis test showed that H_a was accepted and H_0 was rejected, with a significance value (Sig. 2-tailed) of 0.000 being less than 0.05. The research finds that the Project Based Learning (PjBL) approach greatly improves student learning results. This approach has successfully improved student involvement and understanding of academics via hands-on project tasks.

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INTRODUCTION

Basic education is essential for improving students' understanding, perspective, and abilities. Ideally, primary school education should foster a comprehensive conceptual understanding while encouraging national identity by increasing recognition of Indonesia's cultural diversity. Contextual and engaging learning experiences are

essential for impactful education, as they offer students a deep understanding of the subject, rather than just recalling superficially. Improving student learning outcomes depends on providing a supportive educational environment through innovative teaching methods.

This ideal situation is in stark contrast to the current situation. Observations and interviews conducted at SD Negeri 141 Pekanbaru revealed that conventional lecture methods and question and answer formats are still dominant in the teaching of Natural and Social Sciences (IPAS). As a result, many students exhibit a passive approach to limited learning and participation. Students' inadequate understanding, especially regarding the diversity of Indonesian culture, along with learning outcomes that are far below the Learning Goal Achievement Criteria (KKTP), stems from a lack of creative teaching methods. This problem of inadequate learning outcomes highlights the need for change, as current educational methods are inadequate. Students' involvement in the learning process affects their cognitive, emotional, and psychomotor aspects. An important external factor that can improve the quality of learning outcomes is the implementation of an appropriate and student-oriented learning model.

The Project-Based Learning Framework (PjBL) is the most effective solution to this problem. Project-Based Learning (PjBL) is an approach that uses research and collaboration to get students to work on real-world projects. By giving students the opportunity to engage in practical activities, such as creating cultural maps or working on other creative projects, within a culturally diverse framework, Project-Based Learning (PjBL) improves memory and understanding. By offering the stimulating possibility of "experiential learning," Project-Based Learning (PjBL) has shown significant improvements in student engagement, problem-solving abilities, and academic achievement. The study confirms previous research showing the advantages of Project-Based Learning (PjBL) techniques for elementary school students.

METHOD

This study uses quantitative methods and quasi-experimental designs. Using an unequal and non-randomized control group design, participants were divided into two groups: the experimental group and the control group. The experimental group used Project-Based Learning (PjBL), while the control group used conventional learning techniques. Both groups followed a pretest to measure their basic knowledge before therapy, and they followed a posttest to measure their learning outcomes after the intervention. During the 2026 school year, this research was conducted at SD Negeri 141 Pekanbaru, which is located on Jalan Tengku Bey in Pekanbaru. Thirty-five students from classes IV A (17 students) and IV B (18 students) formed the study group. A rigorous sampling strategy was used to include each participant in the experiment. The learning outcomes of students about Indonesian cultural diversity are dependent variables in this study, while the PjBL model is an independent variable.

Data collection was carried out by observation, interviews, and assessment of learning outcomes. Multiple-choice questions that focus on indicators of cognitive learning outcomes, such as remembering (C2), understanding (C2), applying (C3), and analyzing (C4), cover the entire content of the test. Before use, statistical software, Cronbach alpha coefficients, and product moment correlation methods are used to evaluate the validity and reliability of the instrument. To ensure the quality of the exam questions, the complexity of the items is assessed. Different levels of statistical tests are used to assess the data. The first phase of the completeness analysis test involves a reliability assessment, a homogeneity assessment to check for similarities of variance between the two groups, and a normality assessment to ensure the data follows a normal distribution. The concluding phase involves hypothesis testing through an independent t-test of two samples. This evaluation aims to assess how much the application of the PjBL model in schools affects student learning outcomes.

RESULT AND DISCUSSION

Result

This section presents findings from data collected at SD Negeri 141 Pekanbaru during the research process. The main objective of this presentation was to assess how the Project-Based Learning (PjBL) framework affects student learning outcomes about Indonesia's cultural diversity. Results from the pretest that measures students' key skills, the posttest given to the experimental group after the intervention, and the conventional learning for the control group are presented in this paper. This segment features the results of the Swimmer analysis test, which includes an evaluation of homogeneity and normality, with hypothesis testing through an Independent Sample T Test, to demonstrate the significant impact of the applied learning model, along with the raw score data. To validate the research and evaluate the impact of the PjBL model in improving the academic achievement of elementary school students, all data was analyzed with SPSS software.

Learning outcome data

The following descriptive statistics were obtained from the results of the tests given to both groups:

Table 1. Description of Pretest and Posttest Score Statistics

Research Group	Measurement Stage	N	Min	Max	Mean	Standard Deviation
Experiment (PjBL)	Initial Tests	17	40	85	58,82	13,41
	Final Test	17	60	100	83,82	10,08
Controls	Initial Tests	18	20	90	56,94	16,82
	Final Test	18	35	85	58,89	13,23

Source: Research Data Processing (2026)

The average score obtained from the experimental class increased significantly, namely at 25.00 points, then the average score obtained from the control class received an increase of 1.95 points, as seen in the table above. Understanding the distribution of student achievement before and after therapy requires a description of learning outcome data first. Table 1 illustrates how the initial pre-test scores for students in the experimental and control classes are quite close to each other. The class that received the treatment had an average score of 58.82, but the class that did not receive the treatment received 56.94 points. These initial similarities suggest that prior to the learning model intervention, the study group had a balanced baseline awareness of cultural richness. When the post-test phase begins, the results of the students who receive the treatment of applying the Project-Based Learning (PjBL) model show a striking difference. The maximum score for this class is 100, although there has been a significant increase in the average score to 83.82. This 25-point increase shows how well a project-based approach improves students' cognitive abilities. Through relevant and practical project-based activities, students are now able to create their own knowledge rather than simply memorizing it.

In contrast to the experimental group, the control group experienced a different situation when conventional teaching methods were used. The average score increased from 56.94 to 58.89, a slight increase of 1.95 points. In addition, the lowest score for the control group remained 35, well below the passing score. This is in line with previous research that has also shown that the tedious teaching process decreases student engagement and hinders their ability to understand complex concepts. Interesting insights regarding the distribution of students' abilities can also be found by analyzing standard deviation numbers. The standard deviation of the experimental group decreased from 13.41 to 10.08 from pretest to posttest. This decline shows that the application of the PjBL model results in a more balanced distribution of students' abilities at a higher level. In contrast, the control group showed a persistent skill gap, with a standard deviation of posttest of 13.23, which conventional methods failed to address.

In general, this data analysis provides strong preliminary evidence that the PjBL method is able to help students in improving students' learning abilities at SD Negeri 141 Pekanbaru. The difference that we can see is in terms of the increase in initial test points and final tests between students who receive treatment and students who do not receive treatment, emphasizing the value of using learning models that suit students' interests to improve the scores of students who are inadequately assessed. This data analysis builds a solid foundation for initial statistical testing and hypothesis testing to improve the reliability of research results.



Analysis Prerequisites Test

Student learning outcome data were initially evaluated for conformity with parametric statistical analysis (Independent Sample T-Test) prior to hypothesis testing.

a. Normality Test

The purpose of the normity test in this study is to assess whether the pre-test and post-test data can be ensured to be distributed normally or not. In this case, the Shapiro-Wilk test is used (with a sample size of $N < 50$).

Table 2. Data Normality Test Results

Test Type	Research Group	Shapiro-Wilk Value	Significance Value	Conclusion
Pretest	Eksperimen	0,914	0,118	Stated Norm1
	Controls	0,975	0,883	Stated Norm1
Final Test (Posttest)	Eksperimen	0,894	0,055	Stated Norm1
	Controls	0,969	0,776	Stated Norm1

Source: Research Data Processing (2026)

The preliminary test and final test data that have been conducted by the study for the treated and untreated groups show a normal distribution, with all significance levels (Sig.) in the previous table exceeding 0.05. The normality test, which is essential for selecting the right statistical technique for hypothesis testing, serves as a vital first step in analyzing the data of this study. This study was conducted to validate whether the data on student learning outcomes regarding Indonesian cultural diversity from pretest and posttest showed a normal distribution pattern. The researchers chose the Shapiro-Wilk method as a testing tool because of its superior precision and sensitivity for small samples, particularly those with fewer than 50 participants. The facts found in the field from the analysis of the data in Table 1 2 show that the pretest results obtained by the group given treatment received a significance of 1 (Sig.) with a nilai of 0.118, while the group that was not given treatment received a significance level (Sig.) of 0.883. The standard for assessing norms shows that the data obtained from 1 is considered to be distributed in a norm1 when a value or significance point of 1 is obtained greater than 0.05. The data showed that the distribution of students' basic competencies in the two subjects was consistent before the implementation of the learning model intervention, without the presence of too high scores. In addition, the significance value for the experimental group in the post-treatment phase was 0.055, while the value of the control group was 0.776. Although the experimental class received additional intervention through the Project-Based Teaching (PjBL) approach, which was able to help the researchers improve the efficacy of teaching, the distribution found by the researchers remained at the minimum significance threshold of 0.05. We can 1 see from this data that the increase in the outcomes of students who receive treatment does not change the same distribution pattern so that it can be statistically indicated. If each variable meets the conditions of normality, the researcher can continue the analysis using parametric statistics. The normal distribution of data shows that the sample of fourth-grade students at SD Negeri 141 Pekanbaru is quite reflective of the characteristics of the wider population. To improve the methodological validity of the results of the evaluation of the PjBL model, measurement bias can be minimized.

This study shows that the pre- and post-test results for the 1 group that received the recognition and did not receive the recognition remained at the norm distribution value1 and met the important requirements for the implementation of the Independent Sample T Test. This allows researchers to consistently evaluate learning outcomes among different groups. This stage establishes an important foundation before evaluating the consistency of variance and conducting hypothesis testing to fully meet the research objectives.

b. Homogeneity Test

The homogeneity test plays a role in ensuring that the variance of data between the experimental group and the contraband is uniform or not.

Table 3. Variance Homogeneity Test Results

Measurement Stage	Value of Levene	Free Degree 1 (df1)	Free Degree 2 (df2)	Signifying cover (p)	Interpretasi
Pretest	0,378	1	33	0,543	Varians homogen
Final Test (Posttest)	3,195	1	33	0,083	Varians homogen

Source: Research Data Processing (2026)

The test results show us that the significance points (Sig.) for those obtained from the initial test stage (0.543) and the final test (0.083) have a difference of 0.05 points. The variability of the data from the study between the treatment and non-treatment groups was found to be consistent. After the normality test, it is important to perform a homogeneity test to ensure that the samples from both IV A and IV B show uniform variance. The purpose of this test was to obtain certainty that variations in learning modes, not large shifts in initial group variance, were the real reason for the differences in learning outcomes. The Levene test is applied to evaluate the similarity of variance between pretest and posttest data. The results of the pretest show a Levene statistic of 0.378 and a significance level of 0.543, we can lihat in Tabe 3. This significance is significantly higher than the standard test threshold of 0.05. This allows for fair comparisons between groups by providing empirical evidence that the classes that received and did not receive the recognition had similar data variances before treatment. The closing measurement, or posttest, yields a Levene statistic of 3.195 and a significance value of 0.083. After applying the Project-Based Teaching (PjBL) mode, the results of the two eyes showed a striking difference, although the significance level was greater than 0.05. This conclusion informs us that although the proportion of those who received treatment was 1 higher than the number of opposites, the variation in data distribution remained consistent. Group variance is considered homogeneous if the parametric statistical criteria have a significance nilai greater than 0.05. The pretest and posttest results met the homogeneity requirements, showing that the high learning outcomes in the diversity of Indonesian culture from the two courses showed similar characteristics. The uniformity of the initial position and the allocation of data of the comparator groups reinforced the internal validity of the study.

The homogeneity test can be a very strong operational basis for bringing research to the Independent Sample T Test stage in hypothesis testing. The similarity of the data variance reinforces the application of the Assumption of Equal Variance in the t-test with substantial confidence. As a result, the results of this study establish a solid methodological basis to assess the effectiveness of the PjBL model in SD Negeri 141 Pekanbaru.

c. Reliabilitas Test

This reliability evaluation has to verify the validity of the instrument (test questions) in producing results after repeated administration. The Alpha Cronbach formula is used to determine the value of the reliability coefficient obtained from the results of data processing.

Table 4. Reliability Test Results

Reliability Coefficient (Cronbach's Alpha)	Number of Instrument Items	Interpretasi
0,907	20	Very high level of reliability

Source: Research Data Processing (2026)

The reliability assessment of the test instrument of the student teacher showed a value of the Alpha Cronbach coefficient of 0.907 for a total of 20 items assessed, consistent with the data presented in Table 4 above. To guarantee that the test instruments used in the experimental research at SDN 141 Pekanbaru show a significant level of consistency and stability when applied multiple times to the same subjects or under similar conditions, this reliability assessment is very important. The main basis of research on the effects of the Project-

Based Learning (PjBL) model is the reliability of the instruments, ensuring that the results of the pretest and posttest accurately reflect the cognitive abilities of the students without the random measurement error factor. By comparing the calculated results with the reliability standards that have been established in education statistics, the resulting coefficient values can be interpreted. Given that the score of this research instrument is 0.907, which is in the range of coefficients of 0.80 to 1.00, it is classified by Guilford as having a very high or very reliable level of reliability. This score indicates that the test instrument exhibits a very high level of consistency because it significantly exceeds the minimum threshold reliability limit, which is usually set at 0.60. This shows that the questions can reliably and appropriately evaluate learning outcomes (internal consistency), guaranteeing that future score improvements will not be caused by deficiencies in the question format.

The results of this highly reliable test allowed the researchers to continue collecting data on the experimental group and the controversial group at SDN 141 Pekanbaru. The findings regarding the influence of the Project-Based Teaching (PjBL) approach on student teaching outcomes were scientifically confirmed, as the tool showed a high level of reliability. The researchers no longer need to evaluate how effectively the measures reflect progress in student learning outcomes after the intervention. The results produced by this tool are considered reliable and consistent in evaluating the extent to which the PjBL model improves students' cognitive understanding of Indonesian cultural diversity in primary education.

Hypothesis Testing (Independent Sample T Test)

Hypothesis tests were carried out to assess the significant influence of the PjBL paradigm on student teaching outcomes.

Table 5. Hasil Independent Sample T-Test (Posttest)

Aspects Tested	Statistics t	df	p-value	Mean Difference
Posttest Score of Learning Outcomes	6,242	33	0,000	24,93

Source: Research Data Processing (2026)

Based on Table 5, the probability of two-sided significance is 1 to 0.000, which is less than 1 to 1 0.05. In other words, H₀ is affirmed, while H_a is affirmed. Therefore, the implementation of the Project Based Teaching (PjBL) model significantly has affected the results of teaching students at SD Negeri 141 Pekanbaru.

Conducting a hypothesis test to show that the implementation of the Project-Based Teaching mode (PjBL) does not have a significant effect is the closing step of the data analysis in this study. The Independent Sample T Test technique was applied to analyze the posttest results for both groups. This phase is important to ascertain whether changes in learning outcomes are primarily due to the treatment elements of the learning model or simply coincidence. Hasil in Table 1 5 shows a nilai t of 1 6,242 with a degree of freedom (df) equal to 33. The probability value of Sig. (two-sided) of 0.000 is the most important finding. This value is significantly less than the significance threshold of 0.05. The null hypothesis (H₀) is rejected, and the alternative hypothesis (H_a) is statistically accepted if the significance value is below 0.05.

The recognition of this alternative hypothesis provides strong evidence that the learning outcomes of fourth-grade students of SD Negeri 141 Pekanbaru are greatly influenced by the application of the Project Based Teaching (PjBL) approach. A mean difference (MED) of 24.93 showed that students who learned through a project-based approach had achievements that were better than students who used conventional methods. This shows that a model of teaching is the main predictor of student academic achievement. These findings are supported by further descriptive data analysis, which show that one of the experiments obtained an average of end-to-end nilai of 1 83.82, while a group of controls obtained a nilai of 58.89. A unique aspect of the PjBL model, which encourages students to engage in real-world projects related to cultural diversity, led to improved performance in this experimental class. In contrast to the control class, where students only attend lectures, the exploratory and collaborative nature of PjBL allows students to achieve a deeper and more sustainable understanding of the topic.



Data analysis shows that the PjBL model is a significantly more effective method to improve learning outcomes related to diversity¹¹ of Indonesian cultures¹¹ in primary schools. In addition to significantly improving cognitive scores, students' direct involvement in making physical items or creations also addresses the problems of low student engagement and boredom that arise during the preliminary research phase. These findings offer an empirical response to the research objectives and predefined problem statements. The results of the analysis¹ data¹ showed that 1 class¹ that¹ used¹ model¹ PjBL¹ (Experiment¹) achieved an average value of 1 end¹ which was 1 more¹ high¹ (83.82) compared to¹ with 1 class¹ control¹ (58.89). This shows that the application of PjBL to engage students in hands-on activities improves their understanding of cultural diversity topics more successfully than conventional methods.

Discussion

The results of this study provide strong empirical support that the Project-Based Learning (PjBL) model greatly improves the learning outcomes¹¹ of grade 11 students of SD Negeri 141 Pekanbaru compared to conventional teaching methods. The main findings showed that the control group had an increase of at least 1.95 points, while the average post-test score for the experimental group increased by 25.00 points, changing from 58.82 to 83.82. Statistics show that the alternative hypothesis (H_a) is accepted, while the null hypothesis (H_0) is rejected when the value of 1 is significance¹ (Sig. A p-value 2-tailed 0.000 is below 0.051). This achievement¹ shows¹ that¹ PjBL is a revolutionary method that is able to overcome educational obstacles that hinder students' academic progress in Indonesian Cultural Diversity, not just functioning as an alternative model. The transition from a teacher-centered approach to a student-centered model, in which 1 student is seen as an active participant rather than a passive recipient of knowledge through lectures, explains this remarkable progress. By undertaking comprehensive and systematic investigative efforts, the PjBL setting allows students to build their own understanding. Yusri et al. (2024) stated that this method helps elementary school students in internalizing abstract learning materials through the encouragement of real-world exploration. By using this "learn by doing" method, students in the experimental classroom achieve a deeper and more sustainable understanding of cultural diversity without the need to memorize the material.

Based on constructivist theory, Project-Based Learning (PjBL) at SDN 141 Pekanbaru has proven to be effective due to significant cognitive involvement during the project phase. As stated by Hasanah & Chamdani (2025), a key factor that influences students' understanding of a topic is their intellectual curiosity, which is aroused during the design and development phases of the project from the core questions. Students incorporate and embed new knowledge into their cognitive processes while engaging in tasks such as developing a map of cultural diversity or other creative outcomes. This explains why the standard deviation of the experimental group dropped from 13.41 to 10.08, showing how effective the Project-Based Learning (PjBL) model is in bridging knowledge gaps in the classroom and aligning students' abilities with high success rates. The advantages of the Project-Based Learning (PjBL) method are seen not only in cognitive factors but also in the development of students' psychomotor and creative skills, which cannot be fostered by traditional methods. According to Widodo (2024), project-based learning can improve students' creative and intellectual abilities by involving them in real-world tasks. Students in the experimental group should use interesting and helpful items to illustrate their understanding of diversity. Fitri et al. (2024) stated that integrating these physical activities with critical thinking creates a well-rounded learning experience that significantly improves students' overall abilities beyond just test results.

Increased post-test results in the experimental group can be attributed to interpersonal cooperation. Students need to work together in teams, interact efficiently, and distribute responsibilities to achieve shared goals during projects. Listiana et al. (2025) affirm that this type of social interaction is essential for education in the 21st century because it encourages the development of students' social skills. This collaborative aspect has significant value in the realm of cultural diversity, as it not only serves as an effective strategy but also reflects the principles of empathy and tolerance that are emphasized. Utami & Nuraini (2023) stated that collaborative PjBL learning effectively encourages appreciation of diversity, improves classroom harmony, and supports the learning process. Research

describing unsatisfactory learning outcomes in the control group presents contrasting views, emphasizing the need for a change in educational approaches. Research shows that an over-reliance on lectures soon causes students to become indifferent, disengaged, and uninterested in mastering challenging subjects. A very low minimum value of the control class of 35 and an average increase of at least 1.95 points are clear indicators. Selasmawati & Lidyasari (2023) stated that conventional methods often do not develop students' critical thinking skills, because they are only considered as consumers of information. The failure of this strategy to improve learning outcomes at SDN 141 Pekanbaru shows that the old method, which is not suitable for today's students, cannot meet the demands of the modern curriculum.

In addition, Project-Based Learning (PjBL) has shown increased intrinsic motivation and emotional involvement of students in learning. According to Fahrezi et al. (2020), long-term memory is directly influenced by the specific task of producing works that give students a feeling of personal satisfaction. Students tend to put in more effort when they feel enthusiastic about the projects they've completed, which naturally encourages consistent performance in exceeding the Learning Goal Achievement Criteria (KKTP). W.N. Putri et al. (2026) stated that improving Higher Level Thinking Skills (HOTS) in elementary schools requires a lively and competitive classroom atmosphere through the implementation of various steps. Character and national identity education relies heavily on the interaction between materials on Indonesian cultural diversity and the effectiveness of the Project-Based Learning (PjBL) approach. Students gain insight into the core of national diversity through practical experience, which goes beyond simply memorizing the names of ethnic groups or dance routines. Al-Kamzari & Alias (2025) states that learning methods that emphasize collaborative group work are significantly more effective in helping elementary school students to achieve a deep understanding of a subject. Therefore, PjBL at SDN 141 Pekanbaru serves as a means to improve cognitive values and foster a deeper awareness of empathy towards Indonesia's socio-cultural reality.

Methodologically, the very high reliability of the instrument (Cronbach's alpha = 0.907) guarantees that the difference in the score of the experimental class is completely valid and not due to bias in the measuring instrument. The findings of the homogeneity and normality test further strengthen the validity of the comparison between class IV A and IV B. The findings from the analysis of the effects of PjBL have a strong degree of scientific reliability due to the careful quasi-experimental study method and stability of the instrument. This is in line with the research of Masters et al. (2025), which shows that project-based methodologies are an effective strategy to overcome problems arising from the complexity of curriculum content.

In short, the implementation of the PjBL model at SDN 141 Pekanbaru has shown extraordinary learning results and is worthy of being adopted quickly and widely. Given the significant differences in achievement between the experimental group and the control group, educators and school leaders should avoid the use of repetitive teaching techniques. By fostering a dynamic, collaborative, and planned learning atmosphere, this method not only improves educational outcomes but also prepares students with valuable skills for the future. These findings affirm the role of PjBL as a standard framework for improving the skills of elementary school students.

CONCLUSION

The application of the Project-Based Learning (PjBL) model has had a substantial and beneficial influence on the learning achievement of fourth grade students of SD Negeri 141 Pekanbaru, especially on the topic of Indonesian Cultural Diversity, as illustrated by the analysis and discussion presented. In contrast to conventional teaching methods, empirical data show that the application of this project-based learning model can significantly improve students' academic achievement. The results of the hypothesis test further support this, showing significant values much lower than the 0.05 threshold, suggesting that the PjBL model contributes to improving educational standards in primary schools.



The striking difference in performance between the two study groups highlighted the effectiveness of the PjBL method. After completing the real-world project task, the final average score of the experimental group increased by 25.00 points, reaching 83.82. The control group, which retained the lecture method, achieved a final average score of 58.89, showing a moderate improvement of 1.95 points. In contrast to less stimulating learning methods, this important difference shows that students' active involvement in creating knowledge through hands-on experience greatly improves memory and understanding of concepts.

The pedagogical effectiveness of the Project-Based Learning (PjBL) model in this study comes from its ability to improve the quality of learning, making it more engaging, collaborative, and student-centered. Students no longer feel bored because they can conduct research, participate in discussions, and create practical works related to the various cultural contexts around them. Research shows that the Project-Based Learning (PjBL) approach is an effective and innovative method to address student engagement and unsatisfactory academic outcomes. It is highly recommended that the PjBL model be widely integrated into the primary school curriculum to create more capable and analytical graduates.

Suggestion

Based on a study that shows the success of the Project-Based Learning (PjBL) paradigm at SD Negeri 141 Pekanbaru, here are some suggestions for further improvement:

1. For Teachers
 - a. When discussing complex topics such as cultural diversity, teachers should start moving from teacher-centered tactics (lectures) to student-centered strategies like PjBL.
 - b. To maximize the growth of students' independence and critical thinking skills, teachers should use their role as facilitators to guide students through the project process.
 - c. To maintain students' intrinsic motivation and a dynamic learning environment, teachers must provide more variety of assignments.
2. For Schools
 - a. Because Project-Based Learning (PjBL) requires real-life project investigation and production activities, schools must provide adequate teaching facilities and resources to facilitate student project activities.
 - b. To improve the quality of the process at all grade levels, school administrators should provide training or seminars to teachers on the methodological steps of the PjBL model.
3. For Prospective Students
 - a. To ascertain whether our conclusions about the effectiveness of PjBL can be used in a variety of contexts, future researchers may conduct comparative studies with larger populations or across different educational institutions.
 - b. In addition to evaluating the cognitive domain (learning outcomes), further research is recommended to thoroughly investigate how PjBL affects emotional domains, such as tolerance, or psychomotor domains.

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