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Impact of Project Based Learning (PjBL) on Enhancing Student Self-Confidence

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ABSTRACT

This study focuses on the issue of students' lack of self-confidence. Many students are hesitant to voice their opinions or ask questions during class, unsure of their abilities, likely to copy answers from peers, afraid of tests, and nervous when performing in front of others. The study employed a quasi-experimental design with two fifth-grade classes: 20 students from MI Sultan Agung and 20 students from Caturtunggal State Elementary School 4 in Yogyakarta. Descriptive statistics and hypothesis testing (independent sample test and paired sample test) were used to analyze the data. The findings show that the Project Based Learning (PjBL) paradigm significantly improves primary school students' self-confidence. The paired t-test results showed a t-value of 17.888 and a significance level of 0.000 ($p < 0.05$), suggesting that the alternative hypothesis (Ha) is accepted and the null hypothesis (Ho) is rejected. This suggests that PjBL is more effective than conventional learning methods in boosting students' self-confidence.

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1. INTRODUCTION

Education aims to establish an educational setting that enables pupils to develop their potential in various domains, including spiritual, personal, intellectual, and social skills (The 2003 Law No. 20 pertaining to SISDIKNAS). Education plays a fundamental role in shaping individuals by providing them with opportunities to realize their full potential across multiple domains. According to the 2003 Law No. 20 pertaining to the National Education System (SISDIKNAS), education serves as a means to foster the development of spiritual, personal, intellectual, and social skills. By creating an environment that supports holistic growth, education equips students with the necessary tools to navigate various aspects of life, enabling them to become well-rounded individuals who can contribute meaningfully to society. In addition, education is crucial for growth and sustainability of a country (Wati et al., 2022). Beyond the personal development of individuals, education is critical for the overall growth and

sustainability of a country. Wati et al. (2022) argue that a strong educational foundation not only enhances the intellectual capital of a nation but also ensures the continuous improvement of its social and economic structures. As citizens acquire more knowledge and skills, they become more capable of driving innovation, improving productivity, and addressing the challenges that their country faces. Therefore, the quality and accessibility of education directly influence a nation's ability to achieve long-term development goals.

Furthermore, the level of education in a country often serves as an indicator of its advancement. (Afifah et al., 2019) highlight that countries with strong educational systems tend to demonstrate higher levels of economic, technological, and social progress. In contrast, nations that struggle to provide quality education typically face issues such as poverty, unemployment, and limited access to basic services. The educational framework of a country serves as a mirror of its current status and a predictor of its future potential for growth and prosperity. Education is a cornerstone of both individual and national development, fostering personal growth while simultaneously driving broader societal progress. By strategically investing in education, nations can secure sustainable development, advance social equity, and enhance the overall well-being of their citizens. This investment is not only underscored by existing legal frameworks but also reinforced by extensive scholarly research, which consistently highlights education as a pivotal factor in shaping the trajectories of individuals and the future success of nations. Consequently, the role of education extends beyond mere academic instruction to encompass a transformative influence on the social and economic fabric of societies, affirming its indispensable role in fostering long-term prosperity and stability.

In the 21st century, education must adapt to rapid changes in technology, globalization, and social dynamics. Students need skills such as creativity, innovation, problem-solving, critical thinking, teamwork, communication, and various forms of literacy (Angga, 2022). For education in the twenty-first century to be able overcome obstacles in the field, it has a significant role and obligation. The "4C" skills—critical thinking, innovative problem solving, communication, and teamwork are the four abilities that make up 21st-century talents (Rusminati & Juniarso, 2023). In addition, according to Khalishah & Mahmudah (2022) Students must possess four talents in order to learn in the twenty-first century: collaboration, communication, critical thinking, and creative thinking.

A fresh viewpoint derived from the 2018 PISA research results released by the Indonesian Ministry of Culture and Education (Kemendikbud RI) states that optimism with students' own abilities is not high (Wanti & Chastanti, 2023). This situation underscores a profound issue within the educational system, where a significant number of students struggle with a lack of belief in their own capacity to succeed. This deficit in self-confidence not only affects their academic performance but also impedes their long-term personal development. When students do not fully trust their abilities, they may be less likely to engage actively in the learning process, which can prevent them from reaching their full potential. Such low levels of confidence can create a barrier to academic achievement and personal growth, limiting opportunities for intellectual exploration and self-improvement. Addressing this issue is crucial, as fostering a stronger belief in students' capabilities is essential for unlocking their true potential and ensuring their success both within and beyond the educational environment.

This can be backed by study findings Wiguna et al., (2022) revealed that low student confidence can be seen from students who do not dare to express opinions or ask questions during learning, are not confident in their abilities, when doing homework tend to follow their friends' answers, are afraid when appointed by the teacher when given a problem, are afraid of facing tests, and are nervous when performing in front of their friends. The research highlighted that students are often reluctant to express their opinions or ask questions during class discussions. This reluctance is not merely a sign of shyness but points to a deeper lack of self-assurance in their intellectual capabilities. As a result, these students miss out on valuable opportunities to clarify their understanding and actively participate in the learning environment. Building student confidence is crucial for fostering an environment where learners feel empowered to take risks, ask questions, and develop critical thinking skills. Teachers and educators play a key role in creating supportive classrooms that encourage student participation and self-expression without fear of judgment. By addressing these confidence gaps, schools can help students not only

succeed academically but also develop the resilience and self-assuredness necessary for future challenges.

A pre-study analysis utilizing a Likert scale self-confidence questionnaire provided valuable insights into the varying levels of self-confidence among students. The results indicated that only a small portion, 3.7%, of the students exhibited very high self-confidence, while 29.62% demonstrated high levels of confidence. The majority of the students, 59.25%, fell into the moderate category, showing that although they possess some degree of self-assurance, there is still room for improvement. Additionally, 7.4% of the students reported having low self-confidence, but none registered very low self-confidence. These findings highlight the varying degrees of confidence that exist within the student population and suggest that many students may still struggle to fully believe in their abilities.

Further qualitative insights were gathered through observations and interviews with fifth-grade teachers, which revealed more detailed behaviors related to students' self-confidence, particularly in classroom settings. Teachers noted that during presentations, students frequently exhibited signs of discomfort and hesitation. Many students appeared nervous when speaking in front of their peers, suggesting that even those with moderate confidence may lack the ability to project it when under pressure. This lack of confidence during presentations not only affects students' communication skills but may also hinder their ability to fully engage in the learning material, as they shy away from active participation.

Moreover, teachers observed that students tend to show minimal interaction during group activities and hesitate to ask questions. This reluctance to participate fully in collaborative tasks may indicate that students are not confident enough to contribute their ideas or opinions, which can limit their development in teamwork and critical thinking. Similarly, the hesitation to ask questions during lessons points to a fear of judgment or failure, which can stifle curiosity and deeper learning. These observations underscore the need for interventions that boost students' confidence, helping them become more active participants in their education and better prepared for future challenges.

Given these findings, there is a need for effective teaching strategies to enhance students' self-confidence, a learning model must be implemented in order to assess its efficacy in raising students' self-confidence. One promising approach is Project Based Learning (PjBL), which emphasizes learning through the creation of products or projects (Rati et al., 2017). PjBL promotes scientific and technological literacy, responsibility, and multidisciplinary learning (Suseno et al., 2022). It also aims to boost student motivation and conceptual understanding (Feng, 2014).

This research aims to explore how this pedagogical approach can address the challenge of low student self-confidence in educational settings. Previous studies have emphasized the importance of fostering self-confidence in students, yet there remains a gap in identifying specific teaching models that directly influence this emotional and social dimension. By focusing on PjBL, which is known for promoting scientific literacy, responsibility, and multidisciplinary learning (Suseno et al., 2022), this study takes a step forward in examining its potential to boost students' self-assurance.

While PjBL has been traditionally associated with improving motivation and conceptual understanding (Rati et al., 2017; Feng, 2014), its effects on emotional factors like self-confidence have not been widely explored. This research seeks to address a significant gap by exploring how the hands-on, collaborative, and product-oriented activities inherent in Project-Based Learning (PjBL) can effectively boost students' self-efficacy. By focusing on this aspect, the study seeks to offer fresh perspectives on the broader impacts of PjBL, highlighting not only its contributions to cognitive development but also its potential to foster emotional and social growth. Through this investigation, the research will shed light on how engaging in practical, teamwork-driven projects can enhance students' belief in their own abilities, thereby expanding the understanding of PjBL's benefits beyond traditional academic achievements to include vital aspects of personal and social development.

Through the practical application of Project-Based Learning (PjBL) in classroom settings, this study seeks to evaluate its effectiveness not only in enhancing academic performance but also in cultivating students' confidence to actively engage, participate, and articulate their ideas. By focusing on these dimensions, the research aims to deepen the current understanding of how experiential learning methods like PjBL contribute to a more holistic student development process, addressing both intellectual and

emotional growth. This approach offers a novel perspective on how PjBL can function as a powerful tool in fostering self-confidence among students, an often-overlooked but crucial element for their future success. By highlighting these benefits, the study underscores the importance of incorporating PjBL into educational practices to support and develop students comprehensively, thereby enhancing their readiness for future challenges and opportunities.

The research will address the following questions: To what extent does PjBL influence students' self-confidence during classroom activities? How does the implementation of PjBL affect students' willingness to participate in discussions, presentations, and group tasks? Additionally, what specific aspects of PjBL contribute to enhancing or inhibiting students' self-assurance in their academic performance? By exploring these questions, the study seeks to provide a comprehensive understanding of the relationship between PjBL and student confidence in the learning process.

This research holds significant implications for the field of education, particularly in promoting teaching approaches that address both academic achievement and the emotional and social development of students. The findings suggest that educators can benefit from adopting PjBL as an effective method to foster self-confidence, encouraging students to actively participate, express their ideas, and face challenges with greater assurance through project-based learning. For policymakers, this research provides a foundation for implementing policies that support the widespread integration of PjBL in curricula, with the aim of enhancing students' confidence and preparing them for real-world challenges. Moreover, this study opens avenues for further research into the relationship between pedagogical models and students' psychological well-being, emphasizing the need for holistic educational strategies that nurture both intellectual and emotional growth.

The purpose of this study is to show how PjBL affects elementary school students' self-confidence. In addition, this study examines the comparison of PjBL and traditional knowledge gained in terms of increasing students' self-confidence. Research conducted by Kamilah and Allanta, showed that the utilization of the PjBL had positive effect and could increase student confidence. However, the study only used the literature review method and used a sample of high school students, not directly applied to elementary school students. Therefore, this study was carried out in order to find out how the application of PjBL affects the self-confidence of elementary school students.

2. METHODS

This research uses a quasi-experimental research design with a quantitative approach to ascertain how the Project-Based Learning (PjBL) paradigm affects self-confidence of fifth- pupils in elementary school. This study will employ Its research design was a pretest-posttest non-equivalent control group design. Its research design was a pretest-posttest non-equivalent control group design.

Table 1. Pretest-posttest control group design

Group A	O_1	X_t	O_2
Group B	O_3	X_c	O_4

Creswell (2015)

Description:

Group A	:	Experiment Class
Group B	:	Control Class
O_1	:	Experiment Class *Pretest*
O_2	:	Experiment Class *Posttest*
O_3	:	Control Class *Pretest*
O_4	:	Control Class *Posttest*
X_t	:	Experimental class treatment
X_c		Control class treatment

The research was conducted from December 2023 to February 2024, over five meetings: three learning sessions, one initial ability test, and one final ability test at each school. Purposive sampling was used to select control and experimental classes. Information was gathered using questionnaires, interviews, and observations. A Likert scale was used to measure students' self-confidence, with responses ranging from (STS) strongly disagree to (SS) strongly agree. The scale consisted of 22 items. Self-confidence scale scoring criteria are detailed in Table 2. This scale consists of 22 question items and will be filled in by students themselves by placing a *checklist* on the alternative answers for each question item.

The following are the criteria for scoring the *self-confidence* scale.

Table 2. Scoring of Questionnaire Items

	Options			
Nature	SS	S	TS	STS
Positive	4	3	2	1

The instruments were validated for construct and content validity. Validity test confirmed the instrument's accuracy, while the reliability test ensured consistency in measurement results. Data analysis was performed using SPSS software. Descriptive statistics and hypothesis testing, including paired sample tests and independent sample tests, were used.

3. FINDINGS AND DISCUSSION

The implementation of *pretest* to measure students' *self-confidence* was carried out before treatment. The *pretest* aims to see students' initial understanding before being given treatment. In addition, the *posttest* was conducted to obtain data after the treatment carried out. The objective of final questionnaire and posttest is to determine whether there has been any variation in the impact of the treatment on students' self-confidence. The presentation of research results uses several steps, namely: testing instruments and prerequisite analysis, presenting data descriptions and testing hypotheses.

3.1 Instrument Testing Results and Prerequisites

Ascertain whether a questionnaire is appropriate for gathering data on the research topic, instrument testing is done. There are two types of tool testing: reliability testing and validity testing. Validity testing is done to evaluate the accuracy of questions and statements in a questionnaire and test. 40 people made up the entire sample to assess the validity of the questionnaire. To test the validity, researchers compared the Pearson correlation of each element with *r-product moment*. Statement elements and questions are valid if r count> r table 0.31 and vice versa. Below is the validity test on the questionnaire statement

Table 3. Validity Test Results of Self-Confidence Questionnaire

No. Item	R-Count	R-Table (N=40)	Sig.	Description
1	0.527	0.31	.000	Valid
2	0.665	0.31	.000	Valid
3	0.505	0.31	.001	Valid
4	0.446	0.31	.004	Valid
5	0.427	0.31	.006	Valid
6	0.456	0.31	.003	Valid
7	0.690	0.31	.000	Valid

8	0.558	0.31	.000	Valid
9	0.579	0.31	.000	Valid
10	0.558	0.31	.000	Valid
11	0.690	0.31	.000	Valid
12	0.637	0.31	.000	Valid
13	0.484	0.31	.002	Valid
14	0.781	0.31	.000	Valid
15	0.678	0.31	.000	Valid
16	0.691	0.31	.000	Valid
17	0.534	0.31	.000	Valid
18	0.763	0.31	.000	Valid
19	0.638	0.31	.000	Valid
20	0.783	0.31	.000	Valid
21	0.665	0.31	.000	Valid
22	0.537	0.31	.000	Valid
23	0.422	0.31	.007	Valid
24	0.523	0.31	.001	Valid

The reliability test in this study used SPSS version 22 to see *Cronbach's Alpha* the *correlated item* value is at least 0.60. Results of the student self-confidence reliability test are shown in the following table.

Table 4. Reliability results of *Self-Confidence* questionnaire

Reliability Statistics			
Variables	Cronbach's Alpha	N of Items	Description
Self Confidence	.920	24	High Reliability

Cronbach's Alpha 0.678> 0.60 shows that the variable is considered reliable based on the reliability test findings of the self-confidence questionnaire, as stated by the above table, while Cronbach's Alpha 0.920> 0.60 is indicated by the self-confidence questionnaire.

Table 5. Self-Confidence Normality Test Results

Variables	**Group**	**Significance**	**Category**
Self-Confidence	Control *Pretest*	0.071	Normal
	Control *Posttest*	0.063	Normal
	Experiment *Pretest*	0.361	Normal
	Experiment *Posttest*	0.64	Normal

The data for PjBL and PBL Are generally distributed based on the findings of Shapiro-Wilk normality test on student self-confidence because the experimental class and control class pretest values are 0.071 and 0.361, respectively, meaning that p>0.05, and their posttest values are 0.063 and 0.64, respectively, indicating that the data is normally distributed.

Table 6. Homogeneity Test Results of Student *Self-Confidence* Ability Data

Variables	Group	Significance	Category
Self-Confidence	Control	0.690	Normal
	Experiment	0.665	Normal

The changes in student self-confidence data are homogeneous, according to the results of the student self-confidence homogeneity test above, which shows that the experimental class's self-confidence significant values are 0.665> 0.05.

3.2 Description of Student Pretest and Posttest Self-Confidence Data

Self-confidence scores on pretests and posttests given to students in class groups utilizing the PjBL model at the start and conclusion of treatment. In conclusion, the data on student self-confidence is displayed in the table below.

Table 7. Descriptive Data of Student *Self-Confidence* Scale

Class	N	Min	Max	Mean	Std. Deviation
Control Class *Pretest*	40	73.00	79.00	76.4500	1.55167
Control Class *Posttest*	40	73.00	80.00	76.8250	1.69293
Experiment Class *Pretest*	40	73.00	82.00	77.0750	2.16484
Experiment Class *Posttest*	40	81.00	88.00	84.6250	1.98310
Valid N (listwise)	40				

The data displayed Table 7 shows that the control class has the highest pretest self-confidence score of 79.00, whereas The test group possessed the highest score of 82.00. Furthermore, experimental class had a pretest self-confidence level of 73.00, while the control class had a score of 73.00. Additionally, pupils in the trial course had average pretest self-confidence of 77.08, compared to 76.45 for those in the control class.

Additionally, according to the information in Table 7, it is known that students' posttest self-confidence in the experimental class has a maximum score of 88.00, whereas in the control class it is 80.00. Additionally, students' posttest self-confidence in the experimental group received the lowest rating at 81.00, while in the control class it was at 73.00. In the control group, the mean posttest self-confidence score of the students was 76.83, whereas in the experimental group, it was 84.63 years. The mean scores on the pretest and posttest for students' self-confidence in the experimental and control groups. The overall increase in pretest to posttest results of student confidence as observed in the experimental class Figure 1.

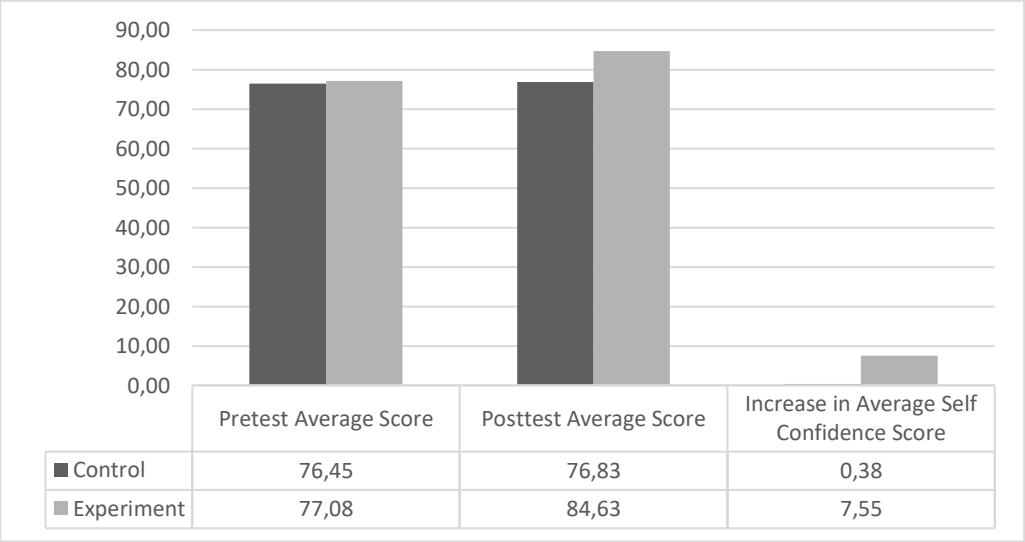

Figure 1. The rise in the mean results of the pretest and posttest of experimental class

Based on Figure 1, the average score increase from pre-test to post-test results of student confidence in the experimental class was 7.55.

3.3 The Effect of PjBL on Student Self-Confidence

Using findings of the pretest and posttest data, this hypothesis test was carried out to ascertain the impact of the PjBL on student self-confidence. Additionally, the computation is done with the SPSS 22 application utilizing a t-test analysis at a significance threshold of 0.05 or 5%. The table below summarizes the analysis results.

Table 8. Test Results of the Effect of PjBL on Students' *Self-Confidence* Ability

Variables	Class	t	Significance	Category
Self-Confidence	Experiment Class	17.888	0.000	There is a significant impact
	Control Class	1.152	0.256	No significant impact

According to the influence test results table, the paired sample test method's test results with a significance level of 0.05 or 5% yielded a significance value of sig. 0.256 in the control class indicates no significant impact, indicating that Self-confidence has no impact on the control class. While the experimental class's t test results using the paired test method were revealed With a significance level of 0.000, indicating that the sig. 0.000 < 0.005 suggests a noteworthy influence, it can be deduced that the use of the PjBL model in the experimental class affects the self-confidence of elementary school pupils. In addition, In the experimental class, the t value is 17.888 which shows that the treatment given to There is an in the experimental class greater influence than the control class.

To ascertain whether there existed a distinction in the average self-confidence score between the control class and the experimental class, the researcher first analyzed the paired sample t-test and then performed an independent sample t-test. The following table shows the findings of the examination of student self-confidence data calculations comparing classes applied to PBL models and PjBL model learning.

Table 9. Test results of differences in self-confidence of students using PjBL with PBL

Variables	Class	Significance	Category
Self-Confidence	Experimental Class - Control Class	0.000	There is a significant impact.

The above table shows the sig value that was produced from the calculation of student self-confidence data across classes utilizing the PjBL model and PBL model. The 2-tailed value is 0.00. These findings suggest that the significance value. 0.000 <0.05 (2-tailed) it may determine that there is a considerable difference in self-confidence of pupils who use the PBL learning model combined with PjBL learning model students, such that Ha is accepted and H0 is rejected.

The subsequent therapy or treatments are administered using the PjBL model paradigm, which is based on the pretest's findings on students' self-confidence. The average student self-confidence score increased to 84.63 with a high category in the posttest findings following the intervention. Furthermore, computations pertaining to the impact of the PjBL learning model on student confidence indicate that the sig value is 0.000 <0.05, indicating that the PjBL learning model has an effect on elementary school students' self-confidence. This is consistent with studies carried out by Ayu et al. (2024) demonstrates how PjBL instruction can boost students' trust in the educational process. this is because PjBL education involves students actively in the process of learning. However, this research is only limited to analyzing the research conducted by applying the PjBL model in increasing student confidence using literature review. While this study compares the application of PjBL in the experimental class with conventional application in the control class.

Discussion

The comparison between project-based Learning (PjBL) and conventional teaching models is markedly demonstrated through the statistical analysis of the impact of self-confidence. In the control class, which employed a conventional teaching model, the paired sample test revealed a significance value of 0.256, indicating no significant effect on students' self-confidence ($p > 0.05$). This result implies that the traditional instructional methods used in the control class did not substantially alter or enhance students' self-confidence. In contrast, the experimental class, which utilized the PjBL model, showed a significance value of 0.000 in the paired sample test ($p < 0.05$), highlighting a significant impact on self-confidence. The t value of 17.888 in the experimental class underscores a substantial effect of PjBL on boosting students' self-confidence compared to the conventional model. Moreover, the 2-tailed significance value of 0.000 further confirms a considerable difference in self-confidence between students in the PjBL model and those in the conventional model. This significant finding supports the hypothesis that PjBL is more effective in enhancing elementary school students' self-confidence than traditional teaching methods, as evidenced by the higher impact observed in the experimental group.

The comparison between the control group and the experimental group in terms of self-confidence development highlights significant differences attributable to the teaching methods employed. In the control group, which was taught using conventional teaching methods, the data analysis revealed no substantial impact on students' self-confidence, as indicated by a significance value of 0.256 ($p > 0.05$) from the paired sample test. This result suggests that traditional instructional techniques did not effectively enhance students' self-assurance, resulting in limited growth in their confidence levels.

In stark contrast, the experimental group, which was exposed to the Project Based Learning (PjBL) model, demonstrated a notable improvement in self-confidence. The paired sample test for this group yielded a significance value of 0.000 ($p < 0.05$), indicating a significant positive effect on students' self-confidence. The high t value of 17.888 further underscores the effectiveness of PjBL, suggesting that students in this group experienced a considerable boost in their confidence compared to their peers in the control group. The PjBL model's emphasis on hands-on, project-based activities, collaboration, and active engagement appears to have been instrumental in fostering a more substantial increase in self-confidence. Overall, the data reveals a clear advantage of the PjBL model over conventional teaching

methods in promoting self-confidence among elementary school students. While the control group showed minimal progress in self-assurance, the experimental group benefited significantly from the PjBL approach, highlighting its effectiveness in enhancing students' emotional and psychological development.

PjBL learning centers on solving real-world problems and involves students in creating projects that are directly relevant to STEM, students' self-confidence has increased as a result of the program (Rahmat Kanigara et al., 2020). According to Mawaddah & Mahmudi (2021) in the PjBL learning process, students give opinions and design ideas in making solutions to problems to be solved. This will increase student confidence because students get direct experience in the learning process (Yenni, 2018). In addition, PjBL learning encourages students to be independent in exploring and investigating problems and improves students' collaboration skills in groups (Habibah, 2024). This is because students often work together in groups to complete projects that are made.

The application of the PjBL model to increase student confidence in the classroom begins with the selection of projects that are relevant to the curriculum and interesting to students. One of the specific strategies to increase students' confidence in this study is to provide tasks that are appropriate to the students' ability level so that they can feel early success. In addition, teachers provide constructive feedback at regular intervals, encourage collaboration between students, and provide opportunities for students to present work in front of the class. In this way, students can develop communication skills, critical thinking, and feel more confident in their ability to complete the project independently. Teachers also use reflection techniques, such as daily journals, to help students realize their progress and achievements so as to strengthen self-confidence.

PjBL implementation has the power to boost student engagement and motivation during the learning process. Pupils gain self-assurance and a persistent belief in their ability to study (Mirfaka & Kumala, 2023). Pupils with strong self-esteem will contribute significantly to the educational process (Hasbullah et al., 2020). Students tend to be more open to challenges and have confidence that they can overcome obstacles and problems encountered (Allanta & Puspita, 2021). In addition, high self-confidence allows students to more actively participate in class, put forward ideas, and ask questions without fear of making mistakes (Anggraini & Wulandari, 2020). This solid self-confidence creates a positive classroom environment, motivates classmates and has a positive impact on academic achievement. Therefore, according to Bana et al., (2021) nurturing students' self-confidence is not only about the end result of learning but also shaping them into active and confident participants in dealing with every aspect of the educational journey.

Reflection techniques play a crucial role in enhancing confidence across various fields, particularly in educational and professional settings. The process of reflection allows individuals to critically analyze their experiences, leading to greater self-awareness and improved self-efficacy. For instance, reflective practice in training programs, such as the 'Healthy Conversation Skills' initiative, fosters a positive feedback loop where individuals who engage in reflection and practice of new skills experience growth in their confidence levels (Black et al., 2012). This aligns with the findings of Chooha et al. (2022), who assert that reflection is integral to the learning process for nursing students, enabling them to develop personal skills and self-belief, which are essential for innovation and effective practice. Moreover, the importance of self-reflection is echoed in the work of Boutry (2023), who notes that self-application and reflection are vital for implementing training in psychological skills, thereby enhancing self-confidence and self-efficacy among healthcare professionals. This theme is further supported by the meta-synthesis conducted by Gale and Schröder (2014), which indicates that self-practice and reflection in cognitive behavioral therapy not only improve therapeutic skills but also increase empathy and confidence in practitioners. Such reflective practices are not limited to healthcare; they extend to various educational contexts, as evidenced by the work of Hope et al. (2021), which shows that experiential learning through simulations enhances students' confidence and professional identity.

In addition to reflection techniques, the depth of practical application of the Project-Based Learning (PjBL) model significantly contributes to confidence building. PjBL emphasizes active learning through real-world projects, which requires students to engage deeply with the material and collaborate with peers. This model fosters an environment where learners can reflect on their experiences, leading to

enhanced self-efficacy. For example, Turi et al. (2023) discuss how primary care providers' confidence in addressing complex issues, such as opioid use disorder, is closely linked to their practical experiences and the depth of their training. Similarly, Jamous et al. (2014) found that increased practice time and targeted education significantly correlate with improved confidence in clinical skills among optometrists.

Furthermore, the integration of reflective practices within PjBL can amplify the benefits of this educational approach. As illustrated by Kadji-Beltrán (2024), the use of living labs in teacher education not only enhances content knowledge but also fosters a sense of purpose and motivation, which are critical for building confidence. The collaborative nature of PjBL, combined with reflective practices, creates a supportive learning environment that encourages risk-taking and innovation, ultimately leading to greater confidence among learners. Reflection techniques are essential for increasing confidence across various domains, as they promote self-awareness and skill development. When integrated with the PjBL model, these techniques further enhance the depth of learning and practical application, leading to a more confident and competent workforce.

This research is limited to analyzing the effect of PjBL learning on students' self-confidence, while other variables such as creativity, learning motivation, learning interest, and collaboration skills are not involved due to the limited ability of researchers. In addition, the research implementation process was carried out only in a short time, namely one month, so that student project work was not carried out optimally. Therefore, further research on other variables with a longer research period will increase understanding of the effect of PjBL learning on student abilities.

4. CONCLUSION

This research compared the effectiveness of Project-Based Learning (PjBL) with traditional teaching methods in enhancing students' self-confidence. The findings showed that the PjBL model significantly improved self-confidence, as evidenced by a significance value of 0.000 ($p < 0.05$) and a high t-value of 17.888, whereas the conventional model had no significant impact ($p > 0.05$). This suggests that PjBL's emphasis on active engagement, collaboration, and hands-on projects is more effective in fostering self-confidence in elementary school students. However, the study had limitations, including a focus solely on self-confidence without considering other factors like creativity or motivation. Additionally, the research was conducted over a brief period of just one month, which may have limited the depth of the project work. Future research should explore the impact of PjBL on a broader range of skills and extend the duration of the study to gain a deeper understanding of its long-term effects on student learning.

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