



The Influence of Teachers' Understanding of PBL-Based LKPD on Classroom Management Effectiveness

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Abstract :

This study aims to analyze the influence of teachers' understanding of Project-Based Learning (PjBL)-based Student Worksheets (LKPD) on classroom management effectiveness in elementary schools. This research employed a quantitative approach using a survey design. Data were collected through questionnaires distributed to 40 elementary school teachers in Pontianak City and analyzed using descriptive statistics, Pearson correlation, and simple linear regression analysis. The results showed that teachers' understanding of PjBL-based LKPD was categorized as high ($M = 4.12$; $SD = 0.46$), while classroom management effectiveness was also in the high category ($M = 4.05$; $SD = 0.51$). The correlation analysis revealed a positive and significant relationship between the variables ($r = 0.682$, $p < 0.05$). Regression analysis indicated that teachers' understanding of PjBL-based LKPD significantly influenced classroom management effectiveness ($R^2 = 0.465$). The study concludes that PjBL-based LKPD serves not only as an instructional resource but also as a strategic tool for improving classroom management. The findings imply the importance of strengthening teacher competence through professional development programs focused on PjBL implementation.

INTRODUCTION

Elementary education plays a strategic role in developing high-quality human resources as the foundation for achieving Indonesia Emas 2045 (Pasaribu et al., 2024). The success of education at this level is determined not only by curriculum quality and learning facilities but also by teachers' ability to create effective, engaging, and student-centered learning environments (Sutarti & Ramli, 2025; Thaariq, 2026). Classroom management represents one of the most essential pedagogical competencies because it directly influences teachers' capacity to organize learning environments that support students' cognitive, social, and emotional development (Novaliendry et al., 2023). Previous studies have consistently demonstrated that effective classroom management enhances student engagement, learning motivation, and both academic and non-academic achievement (Chen et al., 2024; Gunersel et al., 2023). Therefore, strengthening teachers' classroom management competence is fundamental to improving the

quality of elementary education and preparing students with the competencies required to meet the challenges of the twenty-first century (Ki et al., 2025; W. Wang et al., 2025).

Despite its importance, classroom management remains a significant challenge for many elementary school teachers, particularly in implementing student-centered instructional approaches that require active student participation (Beahm & Deaton, 2026). Collaborative learning, group discussions, and project-based activities often promote meaningful interaction among students; however, they may also generate classroom disruptions when teachers lack effective management strategies (Munaf et al., 2025; Rosanawati et al., 2025). Such conditions can reduce instructional effectiveness, limit student participation, and hinder the achievement of intended learning outcomes. These challenges have become increasingly prominent following the implementation of the Merdeka Curriculum, which emphasizes active learning, differentiated instruction, and the development of twenty-first-century competencies (Cesbajar & Fauzan, 2026; Tanjung, 2023). Consequently, teachers are expected not only to possess strong subject-matter knowledge but also to master instructional tools and strategies that enable them to organize classroom activities systematically, maintain productive learning environments, and facilitate meaningful student engagement throughout the learning process.

One instructional resource with considerable potential to support effective classroom management is the Project-Based Learning (PjBL)-based Student Worksheet (LKPD) (Rehman et al., 2026). PjBL-based LKPD is designed to guide students through each phase of project implementation systematically, including problem identification, project planning, implementation, and evaluation (Poonputta, 2023; Rahmawati et al., 2026). This structured framework not only helps students understand the learning process but also enables teachers to organize group activities, allocate responsibilities, monitor learning progress, and minimize disruptive classroom behavior (Damaiyanti et al., 2024). Nevertheless, the effectiveness of PjBL-based LKPD largely depends on teachers' understanding of its underlying principles and implementation procedures. Teachers who possess comprehensive knowledge of designing and implementing PjBL-based LKPD are more likely to manage classroom dynamics effectively than those who merely use worksheets as task sheets (Al-Kamzari & Alias, 2025; Chistyakov et al., 2023). This phenomenon suggests that teachers' understanding of PjBL-based LKPD may constitute a critical factor influencing classroom management effectiveness in elementary schools and therefore deserves empirical investigation (Yusri et al., 2024).

Previous studies have extensively examined the contribution of Project-Based Learning (PjBL) to improving students' learning outcomes, critical thinking, collaboration, creativity, and problem-solving skills (Nagamalla et al., 2025; Yang & Chen, 2026). Numerous empirical findings indicate that PjBL encourages active student participation by engaging learners in authentic tasks that require inquiry, teamwork, and self-directed learning (J. Zhang et al., 2023). Likewise, studies on Student Worksheets (LKPD) have demonstrated that well-designed instructional worksheets can enhance learning organization, facilitate student independence, and improve instructional effectiveness by providing structured learning activities and clear performance indicators (Mana et al., 2025;

Muho et al., 2025). Other researchers have also emphasized that classroom management significantly influences the success of student-centered learning because teachers are required to coordinate learning activities, monitor group interactions, and maintain productive classroom environments (L. Zhang & Ma, 2023). Collectively, these studies confirm the educational value of PjBL, LKPD, and classroom management as independent constructs that contribute positively to teaching and learning quality.

Despite these important contributions, the existing literature remains fragmented in explaining how these variables interact from the teachers' perspective. Most previous studies have focused on the effectiveness of PjBL in improving student achievement or on the quality of LKPD as a learning resource, while relatively few have investigated whether teachers' understanding of PjBL-based LKPD influences the effectiveness of classroom management (Alisawi et al., 2025). Furthermore, previous research has predominantly examined student outcomes rather than teachers' pedagogical competencies that determine successful classroom implementation (Boardman et al., 2024; Ilan et al., 2025). This limitation is particularly evident in elementary school settings, where teachers play multiple instructional roles and classroom dynamics are more complex. Consequently, empirical evidence explaining the relationship between teachers' understanding of PjBL-based LKPD and classroom management effectiveness remains limited (Long et al., 2025; Yunita et al., 2022). Addressing this research gap is essential because understanding this relationship may provide valuable insights for strengthening teachers' pedagogical competence and optimizing the implementation of project-based learning in elementary education.

Building upon these limitations, the present study offers a novel perspective by positioning teachers' understanding of PjBL-based Student Worksheets (LKPD) as a predictor of classroom management effectiveness in elementary schools. Unlike previous studies that primarily emphasized student learning outcomes or the instructional quality of PjBL and LKPD, this research investigates the pedagogical competence underlying successful implementation of project-based learning (Ukobizaba et al., 2025). Specifically, it examines how teachers' understanding of the principles, procedures, and classroom application of PjBL-based LKPD contributes to their ability to organize learning activities, facilitate collaborative work, manage classroom interactions, and maintain a productive learning environment. This perspective extends the current body of knowledge by integrating instructional design and classroom management within a single quantitative framework. The findings are expected to enrich the literature on teacher competence while providing empirical evidence to support professional development programs aimed at strengthening the implementation of project-based learning in elementary education.

Based on the identified research gap, this study seeks to answer the following research question: To what extent does teachers' understanding of PjBL-based LKPD influence classroom management effectiveness in elementary schools? It is argued that teachers who possess a comprehensive understanding of the design and implementation of PjBL-based LKPD are more capable of organizing project activities systematically, monitoring student participation, coordinating collaborative learning, and minimizing classroom disruptions.

Consequently, they are more likely to establish an orderly, engaging, and student-centered learning environment that supports the achievement of instructional objectives. Accordingly, this study hypothesizes that teachers' understanding of PjBL-based LKPD has a positive and significant effect on classroom management effectiveness. The findings are expected to provide empirical evidence for policymakers, school leaders, and teacher educators in designing professional development initiatives that enhance teachers' pedagogical competence and improve the quality of project-based learning implementation in elementary schools.

RESEARCH METHODS

This study employed a quantitative research approach using a survey design. The quantitative approach was selected because the research aimed to empirically examine the relationship and influence between teachers' understanding of Project-Based Learning (PjBL)-based Student Worksheets (LKPD) and classroom management effectiveness. A survey design was considered appropriate because it enables researchers to collect measurable data from a relatively large number of respondents through standardized instruments and analyze the patterns of relationships among variables statistically. In this study, teachers' understanding of PjBL-based LKPD was positioned as the independent variable, while classroom management effectiveness was treated as the dependent variable. The research design allowed the researchers to test the proposed hypothesis regarding the extent to which teachers' understanding of PjBL-based LKPD contributes to effective classroom management in elementary schools.

This research was conducted in elementary schools located in Pontianak City, Indonesia. The research location was selected because elementary schools in this area have implemented learning approaches that emphasize student-centered activities, including project-based learning aligned with the principles of the Merdeka Curriculum. Furthermore, teachers in these schools have experience utilizing various instructional media, including LKPD, to support active learning processes. The population of this study consisted of 58 elementary school teachers in Pontianak City. The sample was selected using purposive sampling based on specific criteria, namely teachers who had experience implementing or understanding the use of Project-Based Learning-based LKPD in classroom activities. Based on these criteria, 40 teachers were selected as research respondents.

Data were collected using a structured questionnaire as the primary research instrument. The questionnaire was developed based on theoretical indicators of teachers' understanding of Project-Based Learning (PjBL)-based LKPD and classroom management effectiveness. The respondents consisted of 40 elementary school teachers in Pontianak City who were selected through purposive sampling based on their experience and understanding of implementing PjBL-based LKPD. Data collection was conducted directly at the selected elementary schools during the research period after obtaining institutional permission. The questionnaire employed a Likert scale to measure both research variables. Before the main data collection, the instrument was

tested for validity and reliability to ensure that each item accurately represented the intended constructs. The collected data were then analyzed through descriptive and inferential statistical procedures. Data preparation involved screening and checking response completeness, followed by descriptive analysis using mean scores, standard deviations, frequency distributions, and percentages. Hypothesis testing was performed using correlation analysis and simple linear regression to examine the influence of teachers' understanding of PjBL-based LKPD on classroom management effectiveness.

The validity and reliability of the research instruments were assessed before conducting the main statistical analysis. Content validity was established through theoretical alignment between questionnaire items and the conceptual dimensions of each variable, while construct validity was examined through item validity testing. The reliability of the instrument was evaluated using Cronbach's Alpha coefficient to determine internal consistency. The results indicated that all questionnaire items met the validity criteria with a significance value below 0.05, and the reliability coefficient reached 0.872, demonstrating a very high level of reliability. Furthermore, the robustness of the findings was ensured through statistical verification procedures, including normality and linearity tests, followed by the interpretation of regression coefficients, significance values, and determination coefficients. These analytical procedures confirmed the statistical validity of the findings and provided empirical evidence regarding the contribution of teachers' understanding of PjBL-based LKPD to classroom management effectiveness in elementary schools.

RESULTS AND DISCUSSION

Results

Teachers Understanding of PjBL-Based LKPD and Classroom Management

Teachers' understanding of Project-Based Learning (PjBL)-based LKPD in this study refers to teachers' cognitive and practical abilities in understanding the concepts, components, implementation stages, and utilization of project-based worksheets to support learning activities. This understanding includes teachers' ability to design project activities, organize student tasks, provide clear learning instructions, monitor project progress, and evaluate student outcomes. Meanwhile, classroom management effectiveness refers to teachers' ability to create an organized, conducive, and participatory learning environment through classroom regulation, student engagement management, and learning activity coordination. Based on the quantitative findings, teachers demonstrated a high level of understanding of PjBL-based LKPD ($M = 4.12$; $SD = 0.46$) and classroom management effectiveness ($M = 4.05$; $SD = 0.51$). The significant correlation between the two variables ($r = 0.682$; $p < 0.05$) indicates that teachers' understanding of PjBL-based LKPD is closely associated with their ability to manage classroom activities effectively.

Table 1. Correlation Test		
Variables	Teachers Understanding of PjBL-Based LKPD	Classroom Management Effectiveness

Teachers' Understanding of PjBL-Based LKPD	1	0.682
Classroom Management Effectiveness	0.682	1
Sig. (2-tailed)	—	0.000
N (Sample Size)	40	40

Table 1 shows that teachers' understanding of PjBL-based worksheets (LKPD) has a positive and significant relationship with classroom management effectiveness ($r = 0.682$, $p = 0.000$). The correlation coefficient indicates a strong relationship between the two variables, indicating that increased teacher understanding of PjBL-based worksheets is associated with higher levels of classroom management effectiveness. This finding implies that teachers with a better understanding of the principles, procedures, and implementation strategies of PjBL-based worksheets are better able to organize learning activities, manage student interactions, and maintain a structured classroom environment.

The correlation results further confirm that PjBL-based worksheets are not only instructional resources but also serve as a supporting mechanism for classroom management. The structured stages in the worksheets, including project planning, task distribution, activity monitoring, and evaluation, provide a systematic framework for teachers to control classroom dynamics. Therefore, strengthening teachers' competencies in developing and implementing PjBL-based worksheets can be an important strategy for improving classroom management practices in elementary schools.

Based on the results of the Pearson correlation test, the correlation coefficient value of $r = 0.682$ indicates that the relationship between teachers' understanding of Project-Based Learning-based Student Worksheets (LKPD) and the effectiveness of classroom management is in the strong category (strong correlation). This correlation category refers to the range of 0.60–0.79 which indicates a significant positive relationship between variables. These findings indicate that the better the teacher's understanding in designing and implementing Project-Based Learning-based Student Worksheets, the more effective the teacher's ability to manage learning activities in the classroom.

PjBL-Based LKPD for Effective Classroom Management

PjBL-based LKPD as an instrument for effective classroom management refers to the extent to which project-based worksheets assist teachers in organizing, directing, and controlling learning activities through systematic instructional procedures. In this study, PjBL-based LKPD is operationalized through several indicators, including the clarity of project instructions, organization of student tasks, facilitation of collaboration, monitoring of learning activities, and evaluation of project outcomes. Meanwhile, classroom management effectiveness is measured through indicators related to classroom organization, student engagement, learning discipline, interaction management, and the creation of a conducive learning environment. The regression analysis revealed that teachers' understanding of PjBL-based LKPD significantly influenced classroom management effectiveness ($F = 32.418$, $p < 0.001$), with an R^2 value of 0.465, indicating that 46.5% of classroom management effectiveness

was explained by teachers' understanding of PjBL-based LKPD.

Table 2. Simple Linear Regression Analysis

Regression Model	F-value	Sig. (p-value)	R Square (R ²)
Teachers' Understanding of PjBL-Based LKPD → Classroom Management Effectiveness	32.418	0.000	0.465

$$\text{Regression Equation: } Y = a + bX$$

(Classroom Management Effectiveness = constant + coefficient × Teachers' Understanding of PjBL-Based LKPD)

Table 2 shows that teachers' understanding of PjBL-based LKPD has a significant influence on the effectiveness of classroom management ($F = 32.418$, $p < 0.001$). The coefficient of determination ($R^2 = 0.465$) indicates that 46.5% of the variation in classroom management effectiveness can be explained by teachers' understanding of PjBL-based LKPD, while the remaining 53.5% is influenced by other factors, such as teaching experience, student characteristics, school environment, and instructional support. This finding confirms that teachers' mastery of PjBL-based LKPD is not only related to instructional preparation but also contributes substantially to teachers' ability to organize classroom activities, regulate student interactions, and maintain a productive learning environment.

From a pedagogical perspective, the regression findings imply that improving teachers' competence in developing and implementing PjBL-based LKPD can become an effective strategy for strengthening classroom management practices. Teachers who understand the stages of project planning, task allocation, learning monitoring, and project evaluation are more capable of designing structured learning experiences that encourage student independence and collaboration. Therefore, professional development programs should not only focus on introducing project-based learning concepts but also emphasize practical skills in designing and utilizing PjBL-based LKPD as a classroom management instrument. Through this approach, teachers can transform LKPD from merely a learning worksheet into a strategic tool for creating active, organized, and student-centered classrooms.

Implementation Challenges of PjBL-Based LKPD

Implementation challenges of PjBL-based LKPD refer to the limitations faced by teachers in consistently applying project-based worksheets during classroom learning activities despite having adequate conceptual understanding. In this study, implementation challenges are measured through indicators including the frequency of using PjBL-based LKPD, consistency in applying project-based learning stages, teachers' ability to manage project activities, and the effectiveness of controlling classroom behavior during project implementation. The descriptive analysis shows that although teachers' understanding of PjBL-based LKPD was categorized as high ($M = 4.12$; $SD = 0.46$), several implementation indicators obtained relatively lower scores. The lowest indicator in the teachers' understanding variable was the routine use of PjBL-based LKPD ($M = 3.85$), while the lowest indicator in classroom management

effectiveness was the reduction of classroom disturbances ($M = 3.78$). These findings indicate that teachers' understanding does not automatically result in optimal implementation without continuous pedagogical support.

Table 3. Descriptive Analysis of Implementation Challenges of PjBL-Based LKPD

Variable Dimension	Mean Score	Standard Deviation	Category
Understanding of PjBL-based LKPD	4.12	0.46	High
Understanding of PjBL stages and procedures	4.18	0.42	High
Ability to design project activities	4.10	0.45	High
Routine use of PjBL-based LKPD	3.85	0.58	High (Lowest Indicator)
Classroom management effectiveness	4.05	0.51	High
Student responsibility during project activities	4.25	0.44	High
Student active participation	4.30	0.39	Very High
Reduction of classroom disturbances	3.78	0.62	High (Lowest Indicator)

Table 3 shows that teachers generally have a strong understanding of Project-Based Worksheets (LKPD); however, the frequency of their implementation remains a challenge. Although the overall understanding score reached a high category ($M = 4.12$), the indicator related to the routine use of Project-Based Worksheets received the lowest average score ($M = 3.85$). This finding suggests that teachers have sufficient theoretical knowledge regarding project-based worksheets but have not yet fully integrated them into regular teaching practices. The gap between understanding and implementation suggests that external factors, such as preparation time, availability of supporting materials, curriculum demands, and teacher confidence in managing project activities, may influence the consistency of the implementation of Project-Based Worksheets.

Furthermore, the findings indicate that Project-Based Worksheets positively contribute to student engagement and responsibility, as reflected in high scores for active student participation ($M = 4.30$) and student responsibility during project activities ($M = 4.25$). However, the indicator related to reducing classroom disruptions received the lowest score in the classroom management variable ($M = 3.78$). These results indicate that while project-based worksheets encourage students to be more engaged in learning, classroom control remains a complex aspect that requires additional management strategies. Therefore, teachers need to strengthen their classroom management competencies to optimize the implementation of project-based worksheets.

Discussion

The findings of this study demonstrate that teachers' understanding of PjBL-based LKPD has a significant relationship with classroom management effectiveness. This finding is consistent with previous studies emphasizing that project-based learning requires strong teacher competence in designing structured activities, facilitating collaboration, and managing student interactions (Chistyakov et al., 2023; Poonputta, 2023; Rahmawati et al., 2026).

Similar to Yuksel et al. (2025), this study confirms that well-designed project learning resources can increase student engagement and create a more organized learning environment (Diputra et al., 2025; Y.-F. Wang et al., 2026). However, previous research has mainly focused on the impact of PjBL on student outcomes, such as creativity, motivation, and problem-solving skills, whereas this study extends the discussion by highlighting teachers' understanding of PjBL-based LKPD as a determinant of classroom management effectiveness (Al-Kamzari & Alias, 2025; Damaiyanti et al., 2024; Nagamalla et al., 2025). Thus, this research provides a broader perspective on the pedagogical role of instructional design.

The positive correlation between teachers' understanding of PjBL-based LKPD and classroom management effectiveness ($r = 0.682$) supports previous findings that teacher competence is a critical factor in successful implementation of innovative learning models. Research by Huang and Wang (2022) and Orzach et al. (2024) revealed that structured learning environments and systematic instructional strategies contribute significantly to improving student participation and learning quality (Amadi et al., 2026; Halman et al., 2025). The present study strengthens these arguments by empirically demonstrating that PjBL-based LKPD also functions as a classroom management mechanism (Candra et al., 2026). Theoretically, this finding contributes to the development of pedagogical knowledge by integrating instructional resource design with classroom management theory (Fajarwati & Dienda Saputri, 2026). It suggests that classroom management is not only related to behavioral control but also influenced by the quality of learning structures provided by teachers through instructional materials.

The regression results further indicate that teachers' understanding of PjBL-based LKPD explains 46.5% of the variance in classroom management effectiveness. This finding supports previous literature stating that project-based learning requires teachers to possess planning, monitoring, and facilitation skills to ensure successful implementation (Rahmawati et al., 2026). However, unlike studies that primarily emphasize student-centered outcomes, this research highlights the teacher-centered dimension by demonstrating how teachers' competence in utilizing LKPD affects classroom organization (Budiman & Abdurrahman, 2025; Purnomo et al., 2023). Theoretically, this finding expands the understanding of PjBL implementation by positioning LKPD as a bridge between instructional planning and classroom management practices (Darmawan et al., 2025). Practically, the result implies that teacher professional development programs should provide not only theoretical knowledge about project-based learning but also practical training in designing and applying LKPD to support effective classroom management (Hidayat & Aripin, 2023).

Although teachers demonstrated high understanding of PjBL-based LKPD, the findings reveal challenges related to implementation consistency and classroom control (Chen et al., 2024). The lower scores for routine LKPD use ($M = 3.85$) and reduction of classroom disturbances ($M = 3.78$) indicate that understanding alone is insufficient to guarantee optimal implementation. This finding aligns with previous studies showing that teachers often experience difficulties in implementing innovative learning approaches due to limited preparation time, resource availability, and classroom management complexity (Meera et al., 2025; Orobinskaya et al., 2025). Nevertheless, this study differs from

previous research by identifying a specific gap between teachers' conceptual understanding and practical implementation of PjBL-based LKPD (Awang et al., 2025). These findings highlight the importance of continuous mentoring, collaborative professional learning, and institutional support to ensure that project-based learning can be implemented effectively in elementary classrooms.

Overall, this study contributes to the literature by demonstrating that PjBL-based LKPD should be understood not merely as a learning worksheet but as a strategic pedagogical instrument that supports classroom management effectiveness. The findings complement previous research on project-based learning by showing that the success of PjBL implementation depends on the interaction between instructional resources, teacher competence, and classroom management strategies (Vidergor, 2022). Theoretically, this research proposes an integrated perspective in which learning materials serve both instructional and managerial functions. Practically, the findings encourage schools and policymakers to strengthen teacher capacity through targeted training focused on LKPD development, project management, and classroom regulation strategies. Therefore, optimizing PjBL-based LKPD implementation can contribute to creating more active, structured, and student-centered learning environments in elementary education.

CONCLUSION

This study concludes that teachers' understanding of Project-Based Learning (PjBL)-based LKPD plays an important role in strengthening classroom management effectiveness in elementary schools. The main lesson gained from this research is that well-designed learning resources do not only support instructional delivery but also function as strategic instruments for organizing student activities, increasing engagement, and creating a structured learning environment. The strength of this study lies in its contribution to educational management and pedagogy by empirically demonstrating the relationship between teachers' competence in utilizing PjBL-based LKPD and classroom management practices, an area that remains limited in previous research. However, this study has several limitations, including the limited sample size, the focus on one geographical area, and the reliance on self-reported questionnaire data. Future research is recommended to involve broader samples, different educational contexts, and mixed-method approaches to explore implementation processes more comprehensively.

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