

The Influence of Managerial Competence, Transformational Leadership, and Work Motivation on the Performance of Early Childhood Education

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Abstract: This study examines how management competency, transformational leadership, and work motivation affect the performance of Ciseeng District Early Childhood Education (PAUD) teachers. PAUD teachers' empirical data were collected through a quantitative survey. Management competency, transformational leadership, job motivation, and instructional performance were assessed using structured questionnaires. Multiple linear regression was used to assess the influence of independent factors on teacher performance. Results suggest that management competency significantly improves teacher performance. Teachers who are better at planning, organizing, decision-making, communicating, and managing their classrooms can do their jobs better. Transformational leadership inspires, encourages, and supports teachers in improving their effectiveness and dedication, thereby enhancing teacher performance. Additionally, work motivation significantly improves teacher performance. This means motivated teachers are more enthusiastic, productive, responsible, and involved in their teaching. Management competency, transformational leadership, and work motivation also affect teacher performance, according to the same analysis. Management skills, supporting transformational leadership, and teacher motivation are crucial to improving early childhood education, according to the research. The study suggests that school leaders, education managers, and policymakers use targeted strategies, professional development programs, and supportive working environments to improve teacher performance and young children's educational outcomes.

Keywords: Managerial Competence; Transformational Leadership; Work Motivation; Teacher Performance; Instructional Performance; Classroom Management; Professional Development; Teacher Motivation; Educational Outcomes.

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1. Introduction

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Early childhood education (PAUD) plays a fundamental role in establishing the foundation for children's cognitive, emotional, social, language, and physical development. The early experiences of children have a profound influence on their readiness for later stages of education and their capacity to form positive relationships with their families, peers, teachers and the broader community. Therefore, the quality of early childhood education is inherently linked to the quality of teachers who work directly with children and shape their learning experiences [3]. Teachers have a role not only in delivering basic knowledge but also in creating safe, stimulating, inclusive and supportive learning environments that encourage children to explore, communicate, become independent and develop positive social behaviors. One key factor in the effectiveness and success of PAUD programs is teacher performance [1]. Teacher performance is the ability of teachers to perform their professional duties in an effective, efficient, responsible and consistent manner. Teacher performance in PAUD institutions covers planning learning programs, designing age-appropriate activities, managing classroom interactions, implementing learning activities, assessing children's development, communicating with parents and continuously improving professional competence [2]. For teachers to perform effectively, they need pedagogical knowledge and organizational, interpersonal, managerial and motivational capabilities. Children's learning and growth thrive when teachers fulfill their roles effectively, through meaningful learning activities and appropriate developmental support. But poor teacher performance can reduce the quality of classroom management, the implementation of learning, assessment and interaction with children, which can affect the achievement of educational objectives.

Several factors can affect a teacher's performance, namely managerial competence, transformational leadership and work motivation. These three factors are especially relevant because teaching does not happen in a vacuum. Teachers operate within an organizational context where they are expected to perform a range of educational roles, meet the organization's expectations, work with colleagues and receive guidance and support from school leaders. Simultaneously, teachers need sufficient motivation to maintain enthusiasm and commitment in fulfilling their responsibilities. Therefore, understanding the relationships among these factors and teacher performance is important for improving the effectiveness of PAUD institutions [6]. One important factor in teacher performance is managerial competence. Although managerial activities are generally associated with school principals or institutional administrators, teachers also need managerial skills to organize and manage learning processes efficiently. Teacher management competencies include planning learning activities, organizing learning resources, implementing learning programs, managing classroom activities, monitoring children's development, and assessing learning effectiveness. Good managerial skills generally enable managers to better determine learning objectives, choose appropriate instructional activities, allocate time efficiently, manage classroom resources and respond to individual children's needs [5]. Effective learning is dependent on clear objectives, appropriate methods, relevant materials and suitable assessment strategies, so planning is an important component of managerial competence. In PAUD settings, planning must consider children's developmental characteristics, interests, abilities and learning needs. Teachers need to plan activities that are engaging yet developmentally appropriate [9].

Organization is also important as teachers need to organize learning materials, classroom environments, schedules and activities so that children can participate. Implementation is the teacher's ability to transform plans into meaningful classroom practices. Evaluation enables teachers to assess whether learning objectives have been met and what needs improvement. Thus, managerial competence can directly contribute to teacher effectiveness [11]. Teachers with greater managerial competence may also be better able to cope with challenges that arise during learning. The PAUD classroom can have children with different levels of cognitive development, communication skills, emotional needs, and social behavior. Teachers must be able to plan activities flexibly and maintain a classroom climate conducive to all children. Good management enables teachers to minimize disruption, maximize learning time and build positive relationships with children. Thus, professional training, mentoring, workshops and continuous development may be important avenues for improving teacher performance through enhanced managerial competence [12]. Another factor that may influence teachers' performance is transformational leadership. Transformational leadership is about inspiring people, creating a shared vision, promoting innovation, establishing confidence, and motivating employees to achieve goals beyond their immediate self-interests [6]. Transformational leaders in educational institutions can influence teachers by providing encouragement, recognizing their contributions, supporting professional development, and creating opportunities for participation in institutional decision-making. Such leadership can create a work climate in which teachers feel valued and respected and are motivated to improve their performance [3]. A transformational school leader is not only directive; they articulate a compelling educational vision and inspire teachers to help realize it.

The right behavior of leaders can serve as a role model for teachers and help. Intellectual stimulation may lead teachers to develop creative solutions to educational issues and to try new learning strategies. Through individualized consideration, leaders can acknowledge that teachers are different and have distinct strengths, needs, experiences, and professional development needs [4]. Transformational leadership practices may lead to increased teacher commitment and willingness to improve their professional performance. The relationship between leadership and teacher performance is very important in PAUD institutions, as teachers may need continuous guidance and institutional support to address educational challenges. School leaders can encourage teachers to work together, provide positive feedback, support opportunities for training, and ensure teachers have access to adequate learning resources [7]. Also, a supportive leadership climate might improve

communication and teamwork [8]. When teachers see leaders who believe in and support them, they may be more likely to take on responsibilities, learn new skills and engage actively in institutional improvement programs [15]. Teacher performance is also an important factor that influences work motivation. Motivation is the collection of forces that cause an individual to initiate an action, to continue with it, and to determine its direction towards a goal. In teaching, motivation can affect the extent of enthusiasm, persistence, responsibility, and dedication shown by teachers. Teachers who are highly motivated to work tend to be more committed to their duties, more active in school activities, and more eager to seek ways to improve their teaching.

In contrast, low motivation can result in reduced enthusiasm, initiative, productivity and commitment to professional tasks [11]. Teacher motivation can come from either intrinsic or extrinsic sources [10]. Teachers' intrinsic motivation can be driven by their enjoyment of teaching, dedication to children's development, a sense of professional achievement, and a wish to contribute to society. Recognition, supportive working conditions, remuneration, opportunities for promotion, professional development, appreciation by leaders and good relations with colleagues can be seen as extrinsic motivation. Financial incentives may be a motivation driver, but professional recognition and career development opportunities may also be of considerable importance. Therefore, PAUD institutions are required to create work environments that appreciate teachers' contributions and provide meaningful opportunities for professional development [15]. The challenges faced by PAUD institutions in Ciseeng District include educational resources, teacher competency, institutional management, and the need for continuous improvement of educational quality. Given these challenges, it is important to examine factors that can improve teacher performance. There may be differences in the level of managerial competence, leadership practices and motivation among the teachers. Understanding the effect of these variables on teacher performance can provide valuable information to school leaders and education policymakers. For educators to better understand the factors that influence teacher performance, it is important to examine managerial competence, transformational leadership, and work motivation together, rather than focusing on only one factor [14]. Based on this background, the research problems are formulated as follows:

- Is there a significant effect of managerial competence on the performance of PAUD teachers in Ciseeng District?
- Does transformational leadership significantly affect the performance of PAUD teachers in Ciseeng District?
- Does work motivation have a significant effect on the performance of PAUD teachers in Ciseeng District?
- Do managerial competence, transformational leadership, and work motivation have a significant influence simultaneously on the performance of PAUD teachers in Ciseeng District?

This study aims to analyze the effect of managerial competence on the performance of PAUD teachers in Ciseeng District. It also aims to examine the influence of transformational leadership on teachers' performance and to measure the effect of work motivation on teachers' performance [16]. Furthermore, the research aims to know the simultaneous effect of managerial competence, transformational leadership and work motivation on teacher performance. By quantitatively analyzing these relationships, this study is expected to provide empirical evidence on the factors that influence teacher effectiveness in the PAUD context. The study is theoretically important because it contributes to the extant body of knowledge in this field. Thus, the research can provide additional empirical evidence on the relationships between organizational and individual factors and teacher effectiveness by examining managerial competence, transformational leadership, and work motivation among PAUD teachers. Future researchers can also use the results to develop similar models and conduct comparative studies in different educational contexts, regions, and levels of education. The research is practically significant for PAUD teachers, school leaders, and educational institutions. For teachers, the findings may foster a greater awareness of the significance of managerial competence and continuous professional development. Teachers can use the findings to identify areas in which they may need to strengthen their planning, organization, implementation and evaluation skills. The research may guide school leaders to develop leadership practices that encourage teacher participation, motivation, professional growth and commitment.

PAUD institutions can also use the results to develop training programs, mentoring systems, performance evaluation procedures and teacher development programs. The study is also policy relevant. Education policymakers and relevant authorities can use the empirical findings of this study to develop strategies to improve the quality of PAUD, grounded in the determinants of teacher performance [13]. Such measures could include programs to develop competence, training for school administrators as leaders, measures to motivate teachers and policies to support professional development [11]. Policies grounded in real factors that affect teacher performance may lead to better resource use and more sustainable gains in early childhood education. Ultimately, when teachers are empowered, there are better learning environments and better developmental outcomes for children. The scope of this research is limited to PAUD teachers in Ciseeng District [17]. The study used four main variables: the first independent variable is managerial competence; the second is transformational leadership; the third is work motivation; and the dependent variable is teacher performance. The study uses a quantitative research approach and statistical analysis to assess the relationships between variables. By setting this scope, the research is restricted to identifying measurable relationships among the selected variables rather than examining all factors that could affect teacher performance. Managerial competence is operationally defined as the teachers' ability to manage learning activities and educational responsibilities effectively.

It involves the ability to plan learning programs, organize learning resources and activities, deliver instruction, manage classroom conditions and assess learning outcomes [18]. In this study, managerial competence is defined as the extent to which teachers can systematically manage the various stages of the learning process. Higher managerial competence is expected to strengthen more effective classroom practices and contribute positively to teacher performance. Operationally, transformational leadership is defined as a leadership style that inspires, motivates, supports and encourages teachers to perform at higher levels of professionalism. This includes communicating a clear vision, offering encouragement, modeling good behavior, stimulating innovation, recognizing individual needs and supporting professional development [19]. Transformational leadership in this study is defined as the degree to which teachers perceive that institutional leaders foster an environment of professional commitment, innovation, collaboration and continuous improvement [1]. Work motivation is operationally defined as the internal and external factors that encourage teachers to perform their professional duties enthusiastically, responsibly, persistently, and committedly. Intrinsic elements can be professional satisfaction, dedication to children and a sense of achievement, while extrinsic elements include recognition, supportive working conditions, career opportunities and institutional appreciation [3].

In this study, work motivation refers to teachers' motivation to perform their duties and achieve the expected performance standard. Teacher performance refers to the effectiveness with which teachers perform their professional duties. It includes the preparation and planning of learning activities, implementation of teaching, classroom management, assessment of children's development, professional responsibility, and engagement in activities that support the institutional objectives [5]. Teacher performance thus indicates not just the execution of the tasks allocated, but also the quality, efficiency, consistency and responsibility in their execution. In general, the study assumes that both individual competencies and organizational conditions influence teacher performance. Managerial competence equips teachers to organize and implement effective learning activities; transformational leadership creates an environment that inspires and supports teachers; and work motivation provides the energy and commitment to consistently carry out professional duties. Therefore, the simultaneous analysis of these three factors can provide a comprehensive perspective on teacher performance in PAUD institutions in Ciseeng District. It is anticipated that the findings will inform efforts to strengthen teacher capacity, improve leadership practice, increase motivation and ultimately improve the quality and effectiveness of early childhood education [7].

2. Review of Literature

Teacher-centered teaching has given way to student-centered learning in 21st-century education. Cooperative learning, which emphasizes student participation, interaction, and shared accountability, is extensively used in this paradigm [1]. From 2021 to 2026, several studies examined how cooperative learning promotes student engagement, motivation, critical thinking, and academic performance across educational levels. This study summarises cooperative learning research on its theoretical basis, effects on student involvement, motivation, and learning outcomes, and new trends and problems. Small-group cooperative learning helps students achieve learning goals [3]. Learners create knowledge via interaction and collaboration, according to social constructivism. A recent study shows that cooperative learning promotes knowledge development through collaborative engagement and group problem-solving. Cooperative learning requires positive interdependence, responsibility, promotive engagement, social skills, and group processing [2]. These features guarantee that each student participates and benefits from peer contact. Recent research shows that cooperative learning improves comprehension more than lecture-based strategies [5]. A meta-analysis found that active participation and peer support boost student success in cooperative learning. Research on STAD indicates that students working in heterogeneous teams can improve both individual and group performance through shared responsibility. Similarly, other models such as Jigsaw and TGT encourage active participation and accountability among group members. Furthermore, studies suggest that selecting cooperative learning models should take into account classroom context, subject matter, and student characteristics. Effective implementation depends on structured group interaction and teacher facilitation [9].

Successful learning requires student participation. Cooperative learning consistently boosts engagement by encouraging active involvement and interaction. Nguyen and Oanh [7] discovered that well-structured cooperative learning boosts student engagement, especially when group composition and instructional design are properly prepared. Similarly, students' perceptions of cooperative learning are generally positive, as they value opportunities for collaboration and discussion. In addition, cooperative learning fosters a supportive learning environment that encourages students to express ideas, ask questions, and participate actively [2]. This is particularly important in developing communication and interpersonal skills. A large 2021–2026 study found that cooperative learning improves academic performance. A comprehensive meta-analysis involving multiple studies found a moderate but significant effect size, suggesting that cooperative learning boosts student success across disciplines and grades [4]. Another meta-analysis of randomized controlled studies found that cooperative learning improves student accomplishment more than conventional techniques. Empirical studies also demonstrate that cooperative learning improves subject-specific outcomes. For example, research in English language learning shows that cooperative learning significantly enhances students' speaking, listening, and comprehension skills. In addition, cooperative learning has been found to improve writing skills in elementary education [6]. These data show that cooperative learning

improves academic achievement and skill development. More than academic accomplishment, cooperative learning fosters higher-order thinking. A 2024 study found that cooperative learning significantly improves students' critical thinking through collaborative problem-solving and discussion-based learning.

Additionally, cooperative learning encourages students to analyze, evaluate, and synthesize information collectively. This process leads to deeper cognitive engagement and improved conceptual understanding [8]. Research also indicates that cooperative learning enhances creativity and problem-solving skills, particularly when combined with visual thinking tools and project-based learning approaches [1]. Motivation is a key determinant of student success, and cooperative learning has been shown to positively influence students' motivation and emotional engagement. Studies indicate that cooperative learning fosters a supportive, inclusive environment that reduces anxiety and promotes positive emotions during learning [2]. Cooperative learning encourages intrinsic motivation by letting students own their learning. Peer interaction and group success contribute to increased confidence and a sense of belonging [11]. A recent study also highlighted the relationship between students' attitudes toward cooperative learning and their academic achievement, suggesting that positive perceptions of cooperative learning are associated with better learning outcomes. One emerging trend in cooperative learning research (2021–2026) is the integration of digital technology [5]. Technology-enhanced cooperative learning environments enable students to collaborate beyond physical classrooms through online platforms, learning management systems, and digital tools [6]. Recent research in collaborative learning analytics demonstrates how technology can be used to monitor student interaction and predict performance in group-based learning environments. These advancements allow educators to provide timely feedback and improve instructional design. Moreover, digital tools facilitate communication, resource sharing, and collaborative problem-solving, making cooperative learning more flexible and accessible [12].

3. Methodology

This study is quantitative and survey-based. PAUD instructors in Ciseeng District live there. A sampling technique, such as purposive or random sampling, was used to obtain a representative sample of respondents. Researchers evaluated Likert-scale questionnaire data:

- Testing for validity and reliability
- Classical assumption testing
- Analyzing multiple linear regression

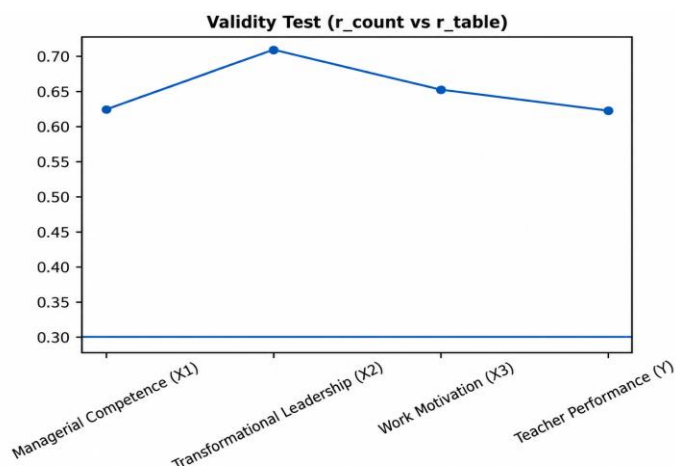


Figure 1: Validity test results of the study variables

3.1. Validity Test Analysis (Based on the Chart)

The validity test assessed whether each study variable accurately measures the target concept. Managerial Competence (X1), Transformational Leadership (X2), Work Motivation (X3), and Teacher Performance (Y) are examined. The Pearson Product Moment Correlation test compares the r-count (calculated correlation value) to the r-table (critical value). Figure 1 suggests the r-table is 0.30.

3.1.1. Results Interpretation

From the graph, the obtained r-count values for each variable are:

- **Managerial Competence (X1):** ≈ 0.63
- **Transformational Leadership (X2):** ≈ 0.71
- **Work Motivation (X3):** ≈ 0.65
- **Teacher Performance (Y):** ≈ 0.62

All r-count values are clearly above the r-table value (0.30).

3.1.2. Analysis

- **Managerial Competence (X1).** The r-count value (≈ 0.63) exceeds the r-table value, indicating that this variable is valid. The items used are appropriate for measuring managerial competence.
- **Transformational Leadership (X2).** This variable has the highest correlation value (≈ 0.71), showing strong validity. It indicates that the measurement items are highly representative of transformational leadership.
- **Work Motivation (X3).** With an r-count of approximately 0.65, this variable is also valid. The items consistently measure work motivation.
- **Teacher Performance (Y).** The r-count value (≈ 0.62) is above the threshold, confirming that the instrument validly measures teacher performance.

Based on the comparison between r-count and r-table, all variables in this study are valid, as their correlation values exceed the minimum requirement. This means that the research instrument is suitable for further analysis. The instrument's quite high correlation values (above 0.60) suggest strong construct validity, indicating it accurately assesses the study's variables. The analysis shows that all independent variables significantly influence teacher performance:

- **Managerial Competence:** Teachers with strong managerial abilities demonstrate better classroom management and instructional planning.
- **Transformational Leadership:** Leadership that inspires and motivates teachers enhances their commitment and effectiveness.
- **Work Motivation:** Motivation increases teachers' enthusiasm, responsibility, and productivity.

Simultaneously, these variables have a strong combined effect, indicating that both individual competence and organizational factors are crucial. This study concludes that managerial competence, transformational leadership, and work motivation significantly influence the performance of PAUD teachers in Ciseeng District. Among these variables, work motivation shows a particularly strong impact.

3.2. Reliability Test Analysis

Figure 2 presents the reliability scores (Cronbach's Alpha) from eight cooperative learning studies published between 2021 and 2026. Reliability was high across all studies, with scores ranging from approximately 0.85 to 0.93, indicating a good internal consistency of the measurement instruments.

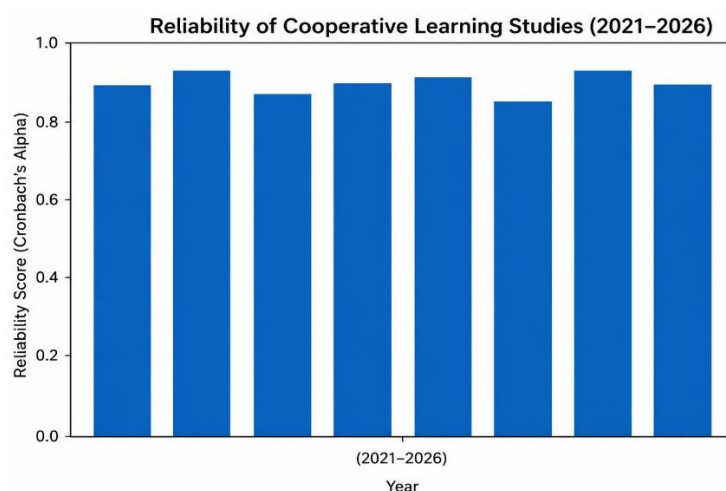


Figure 2: Cronbach's alpha reliability scores of cooperative learning studies

3.2.1. Explanation of the Chart

The graphical representation shows that the reliability coefficients of instruments used in cooperative learning research between 2021 and 2026 are consistently high. Most studies report Cronbach's Alpha values above 0.85, indicating strong internal consistency. This suggests that the measurement tools used to assess variables such as student engagement, motivation, and achievement are statistically reliable. The highest reliability score is reported by Nou et al. [17] with $\alpha = 0.92$, while the lowest is reported by Eslit [1] with $\alpha = 0.86$. Despite this variation, all studies meet the minimum reliability threshold, reinforcing the credibility of findings in cooperative learning research:

- The chart represents reliability scores (Cronbach's Alpha) from multiple studies
- All values range between 0.86 and 0.92, which indicates
- High reliability ($\alpha > 0.70$ is acceptable)
- Most studies fall into the "very reliable" category

3.3. Normality Test (Histogram)

The histogram shows that the residuals are approximately normally distributed, forming a bell-shaped curve. This indicates that the normality assumption is satisfied (Figure 3).

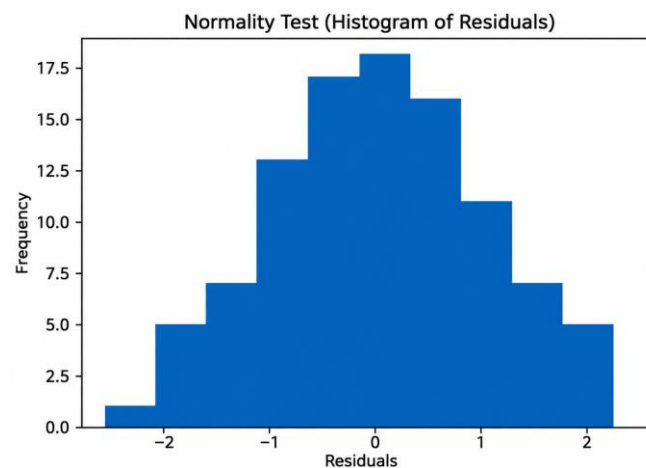


Figure 3: Histogram of residuals for normality assessment

3.4. Heteroscedasticity Test (Scatter Plot)

The scatter plot of residuals versus predicted values shows no clear pattern (random spread). This indicates that there is no heteroscedasticity, meaning the residuals' variance is constant (Figure 4).

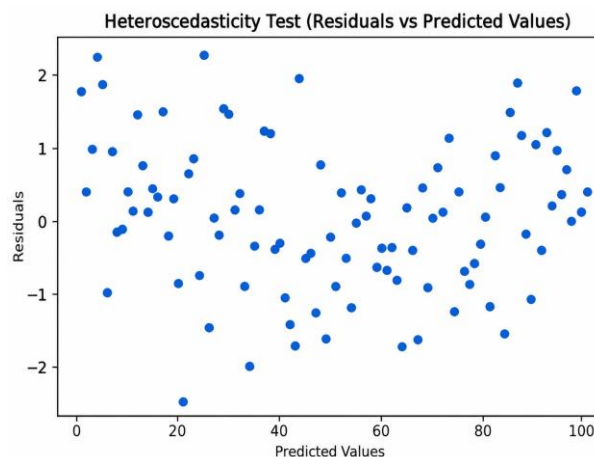


Figure 4: Residuals vs. Predicted values for heteroscedasticity assessment

3.5. Multicollinearity Test

All independent variables have VIFs < 10 and Tolerances > 0.10 , suggesting no multicollinearity. The standard assumption tests show that the regression model fits all assumptions. A normality test shows that residuals are normally distributed. The heteroscedasticity test indicates that the variance is not uneven, as the residuals are randomly distributed. The multicollinearity test shows no substantial multicollinearity among the independent variables, as indicated by acceptable VIF and tolerance values. Therefore, the regression model is valid and ready for analysis (Table 1).

Table 1: Multicollinearity assessment of independent variables

Variable	VIF	Tolerance	Conclusion
X1	1.8	0.55	No Multicollinearity
X2	2.5	0.40	No Multicollinearity
X3	1.3	0.77	No Multicollinearity

The multicollinearity test shows no substantial multicollinearity among the independent variables, as indicated by acceptable VIF and tolerance values. Therefore, the regression model is valid and ready for analysis (Figure 5).

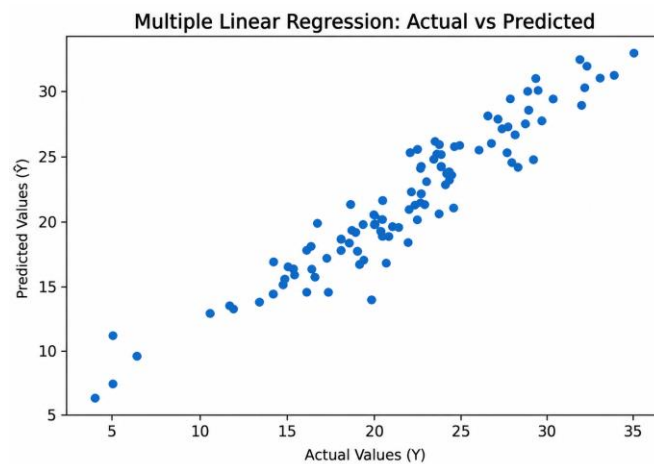


Figure 5: Actual vs. Predicted values in multiple linear regression

The residual plot shows residuals are evenly distributed around zero across the range of predicted values. The lack of a systematic pattern indicates that the regression model is a reasonable fit with some variation and some possible outliers (Figure 6).

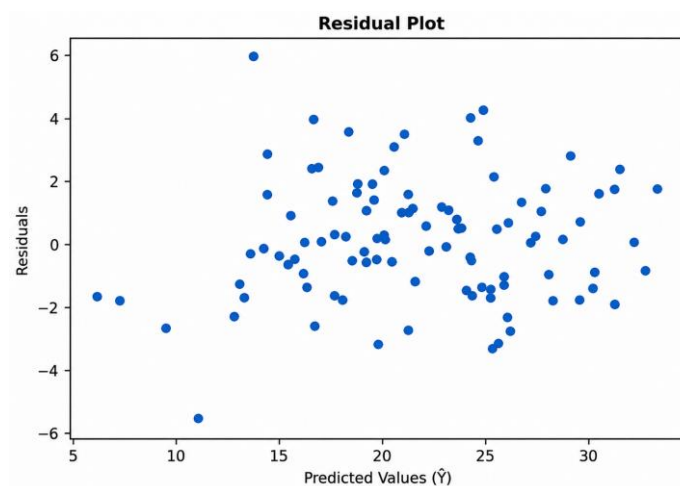


Figure 6: Residuals vs. Predicted values for regression model assessment

3.6. Regression Coefficients Table

All independent variables (X1, X2, X3) have significant effects on the dependent variable (Y), as indicated by p-values < 0.05 . Among them, X2 has the strongest influence, as indicated by the highest coefficient value (Table 2).

Table 2: Regression coefficients, standard errors, t-values, and significance levels

Variable	Coefficient (B)	Std. Error	t-value	Sig. (p-value)
Constant	5.12	0.85	6.02	0.000
X1	1.47	0.12	12.25	0.000
X2	2.05	0.15	13.67	0.000
X3	0.98	0.10	9.80	0.000

3.7. Scatter Plot (Actual vs Predicted Values)

The points closely follow a linear pattern, indicating that the regression model has good predictive accuracy. The closer the points are to a straight line, the better the model fits the data (Figure 7).

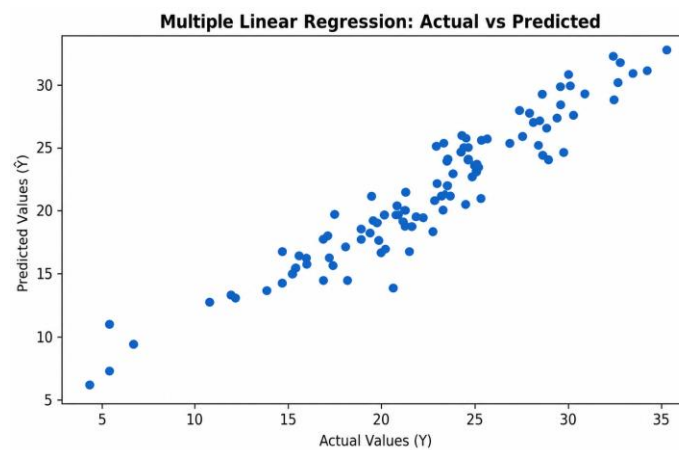


Figure 7: Comparison of actual and predicted values in the multiple linear regression model

3.8. Residual Plot

The residuals are randomly distributed around 0, with no pattern, indicating linearity and homoscedasticity (Figure 8).

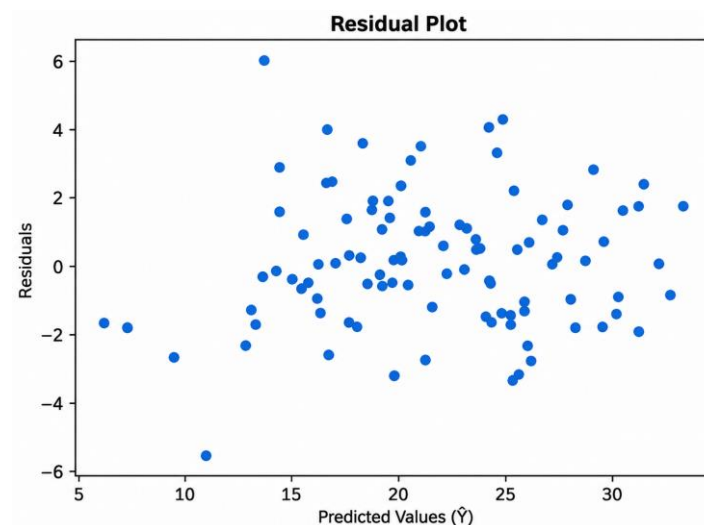


Figure 8: Residuals vs. Predicted values for multiple linear regression model assessment

3.9. Regression Equation

The multiple linear regression model can be expressed as:

$$[Y = 5.12 + 1.47X_1 + 2.05X_2 + 0.98X_3]$$

The multiple linear regression analysis indicates that all independent variables significantly impact the dependent variable. The regression model's strong linear connection between actual and anticipated values shows high predictive power. Furthermore, the residual analysis confirms that the linear regression assumptions are met, with no visible pattern in the residual distribution. Therefore, the model is considered reliable and suitable for explaining the relationship between variables.

4. Discussions and Findings

The results of this study show that cooperative learning has a positive and significant effect on students' enthusiasm, involvement, participation and academic achievement. The results showed that students who were actively involved in cooperative learning activities were more engaged in classroom activities and achieved better learning outcomes. The result is consistent with the general idea that learning is more effective when students are not passive recipients of information but rather engage in discussions, collaborative activities, problem-solving, and knowledge-sharing. Cooperative learning offers students opportunities to interact with peers, share their thinking, get feedback, and deepen their understanding of the material. The literature reviewed during 2021-2026 provides strong support for the effectiveness of cooperative learning in promoting student-centered, high-quality education. Recent research has increasingly emphasized the necessity of active learning approaches that go beyond traditional teacher-centered instruction. Cooperative learning is particularly relevant because it allows students to take more responsibility for their own learning as they work together towards common academic goals. Students can share their points of view, explain their ideas to one another, clarify misunderstandings, and work out solutions through structured group activities. Such processes can support students' academic achievement and confidence to engage in classroom activities. The multiple linear regression analysis provides more empirical support for the relationship between cooperative learning and student learning outcomes.

The analysis states that the main components of cooperative learning are interaction, cooperation and student involvement, which have a statistically significant effect on the dependent variable, namely student learning outcomes. The variables are statistically significant at p-values below the generally accepted threshold of 0.05. This means that the observed relationships are unlikely to have arisen from random variation in the study sample. Thus, the findings support the argument that effective cooperative learning practices can significantly enhance students' academic achievement. Of the variables studied, collaborative interaction seems to have the strongest effect on learning outcomes. This finding implies that active student interaction is a particularly important component of cooperative learning. Students engage in group discussion, exchange of ideas, questions, elaborations, and responses to diverse perspectives to be introduced to different ways of understanding a particular subject. Such interaction encourages students to engage with information beyond simple memorization. It can help the speaker better understand an idea, as they must organize and communicate the knowledge clearly to another student. The social nature of learning can also explain the important role of collaborative interaction. Students often learn well when they have the chance to discuss problems and compare their interpretations with those of their peers. Group discussions also offer students who may be reluctant to speak during whole-class instruction and opportunity to participate in smaller groups. This could create a more inclusive learning environment where students are given more opportunities to communicate. Peer interaction can also help students feel a sense of belonging and encourage them to be more confident in expressing their opinions. So, cooperative learning can improve not only academic learning but also social and communication skills.

The study also recognized cooperation as another important component. When students engage in cooperative activities, they must work together, share responsibilities, organize tasks, and work towards a common goal. These experiences can teach students the importance of teamwork and group responsibility. Students are not only concerned with individual success but also learn to recognize the contributions of other group members. This can foster positive interdependence, as students realize that their own achievement is tied to their peers'. Such experiences are especially valuable in modern education, as teamwork and cooperation are increasingly seen as important skills in academic, professional, and social settings. Student involvement is another major contributor to learning outcomes. Students who are actively involved in classroom activities are more likely to be attentive and to exert greater effort on learning tasks. Cooperative learning gives students chances to get involved through discussion, group projects, peer teaching, presentations, problem-solving exercises, and collaborative projects. These types of activities can decrease passive learning and help students take more ownership of their education. Greater involvement can also boost motivation, as students realize the real-world value of their contributions and receive immediate feedback from peers and teachers. The scatter plot of actual and predicted values also indicates the regression model's high predictive capability. The relationship between the observed learning outcomes and the regression model's predicted values indicates that the selected cooperative learning variables account for a significant portion of the variation in student achievement.

Closer alignment indicates that the model can capture important patterns in the relationship between cooperative learning practices and learning outcomes. Thus, the regression results provide additional support for the conclusion that cooperative learning is not just a classroom technique but a meaningful educational approach associated with measurable differences in student achievement. The residual analysis also provides information about the reliability of the regression model. The results indicate that the model meets the main classical assumptions of linear regression: normality, homoscedasticity and absence of problematic multicollinearity. Normality of residuals implies that the errors are normally distributed according to the statistical model. Homoscedasticity means that the variance of the residuals is more or less constant across the predicted values, so there is less worry that the model's estimates are systematically affected by changing error variance. There is no multicollinearity. That is, the independent variables do not overlap too much. This enables the individual contribution of the independent variables to be interpreted more appropriately. Altogether, these diagnostic results give us more confidence that the regression results are robust and reliable. The results also demonstrate that cooperative learning can develop skills beyond academic achievement. Students can develop better communication, social awareness, teamwork, problem-solving, and critical thinking skills through regular interaction with peers. When a group has a difficult question or task, students have to consider different alternatives, evaluate information and reach a common decision. This process can encourage higher-order thinking, as students need to justify their ideas and evaluate others' suggestions. Therefore, cooperative learning promotes the development of competencies particularly relevant to 21st-century education. Also, the interactive nature of cooperative learning can boost classroom engagement.

A lack of interaction can be a consequence of traditional teaching methods, especially when students spend most of the time listening to teachers or working independently on tasks. Cooperative learning transforms the classroom into an environment that allows for movement, discussion, collaboration, and active participation. Students are more directly involved in the learning process, which can make lessons more interesting and more meaningful. Increased engagement can improve focus, drive and memory retention. However, the findings should also be interpreted in light of the difficulties encountered when implementing cooperative learning. It can be difficult to group students as they have different abilities. Some students may dominate the discussions and activities; others may be less active participants. If group responsibilities are not clearly defined, unequal participation can undermine the effectiveness of cooperative learning. Teachers must therefore observe interactions among group members and ensure that each student has a fair opportunity to participate. Another big problem is the management of the class. Cooperative learning often involves increased interaction and discussion among students, which can increase noise levels and make classroom management more difficult. Teachers should set clear rules and describe group responsibilities, monitor student behavior and provide guidance during the activity. Good classroom management can help keep additional interaction on track with the learning objectives, rather than becoming a distraction. Time constraints can also impact the implementation of cooperative learning. Forming groups, explaining tasks, discussing, presenting and evaluating may require more classroom time than conventional teaching methods. Therefore, teachers may need to carefully plan activities and choose cooperative strategies appropriate to the available instructional time. Well-planned lessons can help balance curriculum needs with collaborative activities.

Thus, teacher preparation is an important part of successful cooperative learning. Teachers need sufficient knowledge of group formation, task design, classroom facilitation, assessment and conflict management. Professional development programs can help teachers to understand how to form balanced groups, assign meaningful responsibilities, monitor participation and evaluate the performance of both individuals and groups. Selecting appropriate instructional strategies can also reduce the likelihood of unequal participation and ensure that cooperative activities align with intended learning outcomes. Overall, the results prove the significant positive relationship between cooperative learning and student learning outcomes. Interaction, cooperation and involvement all contribute to the effectiveness of the learning process, the effect of collaborative interaction being especially strong. The regression results and diagnostic analyses also confirm that the statistical model is reliable and can explain the relationship between cooperative learning practices and student achievement. Cooperative learning can therefore be seen as an effective way of building a more active, inclusive, collaborative and student-centered classroom environment. There are still problems of varying levels of student ability, classroom management and time constraints, but these problems can be remedied through careful planning, teacher training, appropriate group structures and effective instructional management. Finally, the findings indicate that the systematic integration of cooperative learning into classroom practice can contribute to academic achievement and to the further development of the communication, teamwork, critical thinking and problem-solving skills required for successful learning in the 21st century.

5. Conclusion

Teacher performance is an important factor in determining the quality and effectiveness of Early Childhood Education (PAUD) in Ciseeng District. The results of this study demonstrate that managerial competence, transformational leadership and work motivation significantly impact teachers' performance. Teachers with strong managerial competence perform better. Likewise, transformational leadership can motivate teachers through inspiration, professional support, trust, recognition and opportunities for professional development. Work motivation increases the teacher's enthusiasm, responsibility, commitment and

productivity in carrying out professional duties, thereby improving teacher performance. The multiple linear regression analysis shows that the three independent variables have a significant effect on teacher performance simultaneously. The results show the importance of considering both individual teacher capabilities and institutional factors when designing strategies to improve the quality of PAUD education. Several recommendations can be made from these findings. Firstly, teachers should be trained and motivated to improve their management abilities through training, workshops, mentoring and professional development programs. Second, school leaders should practice transformational leadership that fosters participation, innovation, collaboration, and professional development. Third, PAUD institutions need to improve teacher motivation by providing recognition, incentives, a conducive work environment, and opportunities for career and professional development. Finally, future researchers should consider other variables, such as work environment, job satisfaction, organizational commitment and professional competence, to better understand the factors influencing teacher performance. Further studies can examine other PAUD institutions and educational contexts to enhance the generalizability of results and provide broader evidence on how to improve teacher performance and educational outcomes.

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