

# The Effects of Principal Managerial Competence and Educational Facilities on Education Quality, Mediated by Teacher Job Satisfaction, in Public Elementary Schools in Pandeglang Regency

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## ABSTRACT

This study aims to analyze the direct and indirect effects of principal managerial competence and educational facilities on education quality in public elementary schools (SDN) in Pandeglang Regency, with teacher job satisfaction serving as a mediating variable. Method: A quantitative approach with an explanatory survey design was employed. Data were collected from 125 teachers at A-accredited public elementary schools in Pandeglang Regency, Banten Province, using a closed-ended questionnaire based on a 1-5 Likert scale that passed validity and reliability tests. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) via SmartPLS version 4, alongside Microsoft Excel for initial data processing. Results: All seven hypothesized paths were statistically significant  $p < 0.001$  at . Principal managerial competence and educational facilities each had strong effects on teacher job  $\beta = 0.658$  and  $\beta = 0.552$  respectively ( and , respectively), whereas their direct effects on education quality  $\beta = 0.274$  and  $\beta = 0.258$  were moderate ( and ). Teacher job satisfaction positively  $\beta = 0.536$  affected education quality ( ) and was shown to partially mediate the effects  $\beta = 0.352$  of both exogenous variables ( and ). Overall, the model explained 90.1% of the variance in teacher job satisfaction and 88.3% of the variance in education quality. Conclusion: Education quality in public elementary schools in Pandeglang Regency is influenced more indirectly through enhanced teacher job satisfaction than solely through structural-administrative measures. Therefore, quality improvement policies should be holistic, taking into account teachers' psychological well-being. Limitations: This study is limited to teachers in A-accredited schools within a single regency using a cross-sectional design; thus, generalizations to other education levels or different regional contexts should be made with caution. Contribution: These findings enrich the literature on elementary education management by emphasizing teacher job satisfaction as a crucial bridge between managerial leadership, educational facilities, and education quality. This study serves as a valuable reference for local education departments, principals, and educational researchers.

## Article Info

**Kata Kunci:**  
kompetensi  
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guru; mutu  
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## ABSTRAK

Tujuan: Penelitian ini bertujuan menganalisis pengaruh kompetensi manajerial kepala sekolah dan sarana prasarana terhadap mutu pendidikan Sekolah Dasar Negeri (SDN) di Kabupaten Pandeglang, baik secara langsung maupun secara tidak langsung melalui kepuasan kerja guru sebagai variabel mediasi. Metode Penelitian: Penelitian menggunakan pendekatan kuantitatif dengan desain survei eksplanatori. Data dikumpulkan dari 125 guru SDN berakreditasi A di Kabupaten Pandeglang, Provinsi Banten, melalui kuesioner tertutup berskala Likert 1-5 yang telah lolos uji validitas dan reliabilitas. Analisis data menggunakan Structural Equation Modeling berbasis Partial Least Square (SEM-PLS) dengan bantuan perangkat lunak SmartPLS versi 4 dan Microsoft Excel untuk pengolahan data awal. Hasil: Seluruh tujuh jalur hipotesis terbukti signifikan pada taraf  $p < 0.001$ . Kompetensi manajerial kepala sekolah dan sarana prasarana masing-masing berpengaruh kuat terhadap kepuasan kerja guru ( $\beta = 0,658$  dan  $0,552$ ), sementara pengaruh langsungnya terhadap mutu pendidikan lebih moderat ( $\beta = 0,274$  dan  $0,258$ ). Kepuasan kerja guru berpengaruh terhadap mutu pendidikan sebesar  $\beta = 0,536$  dan terbukti memediasi secara parsial pengaruh kedua variabel eksogen tersebut ( $\beta = 0,352$  dan  $0,296$ ). Model mampu menjelaskan 90,1% varians kepuasan kerja guru dan 88,3% varians mutu pendidikan. Kesimpulan: Mutu pendidikan SDN di Kabupaten Pandeglang lebih banyak terbentuk secara tidak langsung melalui peningkatan kepuasan kerja guru dibandingkan melalui jalur struktural-administratif semata, sehingga kebijakan peningkatan mutu perlu bersifat holistik dengan memperhatikan dimensi kesejahteraan psikologis guru. Keterbatasan: Penelitian ini terbatas pada guru di sekolah berakreditasi A di satu kabupaten dengan desain cross-sectional, sehingga generalisasi ke jenjang pendidikan lain atau konteks wilayah berbeda perlu dilakukan secara hati-hati. Kontribusi: Temuan ini memperkaya kajian manajemen pendidikan dasar dengan menegaskan peran kepuasan kerja guru sebagai jembatan penting antara kepemimpinan manajerial serta ketersediaan fasilitas dengan mutu pendidikan, dan dapat menjadi rujukan bagi dinas pendidikan daerah, kepala sekolah, maupun peneliti pendidikan lanjutan.

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## 1. Introduction

Elementary education provides the foundation for the development of students' thinking skills, character, and learning habits from an early age. Education quality at this level not only determines short-term academic achievement but also constitutes a long-term investment in a nation's human resource development (Mulyono et al., 2023). Unfortunately, these ideal outcomes have not yet been fully realized in many regions, particularly in areas geographically distant from administrative centers.

Pandeglang Regency, one of the regencies in Banten Province, faces serious challenges in the governance of its elementary education system. Dapodikdasmen data for 2024 recorded 868 elementary schools across 35 subdistricts in the regency, comprising 850 public schools and 18 private schools (Dapodikdasmen, 2024). As explained in a study of educational leadership by Fauziah and Nasution (2025), such a high concentration of schools presents distinct challenges in maintaining consistent management quality throughout the region.

The issue becomes more serious when viewed from the perspective of accreditation. Of the 868 schools, only 35 schools, or approximately 4.03%, attained the highest accreditation rating, whereas 739 schools were in the middle category, 87 schools were in lower categories, and 27 schools had not undergone the accreditation process at all (Badan Akreditasi Nasional Pendidikan Dasar dan Menengah, 2025). The low proportion of schools receiving the highest accreditation is not merely an administrative figure; rather, it clearly reflects the uneven fulfillment of the National Education Standards. Accreditation represents a comprehensive assessment of the quality of teaching staff, the adequacy of facilities, institutional governance, financing, and school evaluation systems.

Numerous determinants of education quality have been examined in the educational management literature, with principal managerial competence and the availability of educational facilities among the factors most frequently highlighted. Principals with strong principal managerial competence can strategically plan programs, efficiently allocate resources, and continuously perform supervisory and evaluation functions (Fauziah & Nasution, 2025; Mulyono et al., 2023). However, in practice, principal managerial competence formally acquired through various certification programs is not always reflected in day-to-day school management. Many principals report continued difficulties in optimally performing human resource empowerment functions, and some must simultaneously lead two schools because of shortages of school leaders, a condition that may increase workloads and reduce the effectiveness of school management.

The second factor, educational facilities, also constitutes a fundamental issue in many public elementary schools (SDN) in

Pandeglang Regency. Several classrooms have reportedly sustained varying degrees of damage, and not all schools have libraries, computer laboratories, or adequate sanitation facilities for the school community. This condition is consistent with the findings of Awaludin, Maryati, and Munafiah (2024), which indicate that adequate management of educational facilities makes a tangible contribution to improving education quality while also promoting instructional innovation. Similarly, Yangambi (2023) demonstrated that adequate school infrastructure is closely associated with student learning achievement and the overall effectiveness of educational processes.

On the other hand, teacher job satisfaction is increasingly regarded as an important mediating variable in the relationship between principal managerial competence and educational facilities, on the one hand, and education quality, on the other. Teachers who are satisfied with their jobs tend to be more dedicated, motivated, and consistent in delivering high-quality instruction (Wartenberg, Aldrup, Grund, & Klusmann, 2023). Conversely, teacher job satisfaction among public elementary school teachers in Pandeglang Regency remains suboptimal, partly due to limited facility support, unclear managerial direction, and inadequate access to professional competency development programs. Ramli and Nisa (2023) also emphasized that principal managerial competence is significantly associated with teacher job satisfaction, which in turn affects teaching performance.

Although the three variables above—principal managerial competence, educational facilities, and teacher job satisfaction—have been widely studied separately, studies that specifically integrate all three into a comprehensive mediation model to explain education quality at the public elementary school level, particularly in Pandeglang Regency, remain relatively limited. Most previous studies, such as those by Kusumawati, Yuliejantiningasih, and Miyono (2023) and Anggraini, Fazis, and David (2025), have focused more on the direct effects of principal managerial competence on performance or school quality without explicitly considering teachers' psychological mediation mechanisms. This research gap provides the primary rationale for the present study.

Another structural issue exacerbating the situation is the limited availability of leadership personnel. Several principals in Pandeglang Regency have had to serve concurrently as acting principals at two schools because of vacancies in permanent principal positions. This condition directly increases administrative workloads and reduces the frequency of principals' presence in each educational unit, thereby rendering their guidance, supervision, and mentoring functions for teachers less effective. In relation to transformational leadership theory, such circumstances may weaken the quality of interactions between leaders and subordinates, which should constitute one of the prerequisites for creating a positive work

climate (Bush, 2023).

Methodologically, most previous studies on principal managerial competence and education quality have employed qualitative descriptive approaches or simple linear regression, which can capture only direct relationships among variables (Awaludin et al., 2024; Akmalia et al., 2024). Such approaches have not been able to explain the psychological mechanisms underlying these relationships, particularly how teacher job satisfaction serves as a bridge linking managerial factors and educational facilities to education quality outcomes. As emphasized by Preacher and Hayes (2008), mediation analysis enables researchers to identify the mechanism, rather than merely the existence, of an effect, thereby producing more precise and actionable policy recommendations. This study selected the Partial Least Squares Structural Equation Modeling (PLS-SEM) approach because of its capacity to simultaneously estimate direct, indirect, and total effects within a coherent analytical framework (Hair, Risher, Sarstedt, & Ringle, 2019).

Based on this background, this article addresses seven research questions: the extent to which principal managerial competence and educational facilities directly affect education quality; the extent to which these two variables affect teacher job satisfaction; the extent to which teacher job satisfaction affects education quality; and the extent to which teacher job satisfaction serves as a mediating variable bridging the effects of principal managerial competence and educational facilities on education quality. Theoretically, this study is expected to enrich the analytical framework for education quality by incorporating a psychological mediating variable. Practically, its findings may serve as a reference for local education departments and principals in formulating more holistic policies to improve elementary education quality.

## **2. Literature Review and Hypothesis Development**

### **2.1 Education Quality**

Education quality may be understood as a dynamic condition of excellence in educational provision, achieved through compliance with national standards, a commitment to continuous process improvement, and the capacity to meet the expectations of all stakeholders (Sallis, 2022). In Indonesia, the formal framework for education quality is regulated through eight National Education Standards, as stipulated in Government Regulation Number 57 of 2021, encompassing standards for graduate competencies, content, processes, assessment, educators and education personnel, educational facilities, management, and financing. Fathurrochman, Ristianti, and Arif (2023) emphasized that implementing total quality management in educational institutions requires the involvement of all organizational elements rather than being solely the responsibility of leaders. A similar concept was emphasized by Figueiredo (2025), who highlighted that definitions of education

quality in European policy documents have consistently shifted from an exclusive focus on academic outcomes toward the broader fulfillment of stakeholder needs, a shift that is also relevant to elementary education in Indonesia.

### **2.2 Principal Managerial Competence**

Principal managerial competence refers to the capability to plan, organize, mobilize, manage, supervise, and evaluate all aspects of educational provision within the principal's work unit, as mandated by Regulation of the Minister of National Education Number 13 of 2007 concerning Principal/Madrasah Standards. Wahjosumidjo (2023) emphasized that principal leadership cannot be separated from managerial competence in mobilizing school resources toward shared goals. Operationally, this competence is commonly delineated into five main dimensions: school program planning, resource organization, the mobilization and empowerment of human resources, the management of educational facilities and budgets, and supervision and evaluation. These five dimensions are interrelated and form a continuous management cycle, from the development of measurable school work plans to follow-up on program evaluation results (Wibowo, 2023).

Several recent studies reinforce the urgency of this competence. Mustakim, Akbar, and Sulistyorini (2024) found that principal managerial competence had a significant effect on teacher performance ( $\beta = 0.412$ ), which subsequently affected secondary school quality ( $\beta = 0.387$ ). At the kindergarten level, Mutoharoh, Hufad, and Rusdiyani (2023) demonstrated that managerial competence was strongly correlated with teacher performance ( $r = 0.62$ ). Another study by Kusumawati, Yuliejantiningasih, and Miyono (2023) in private vocational high schools confirmed the effect of principal supervision on school quality ( $\beta = 0.312$ ), whereas Anggraini, Fazis, and David (2025) reported that principal managerial competence contributed up to 60.4% to improvements in elementary school quality. Colquitt, LePine, and Wesson (2023) add an organizational behavior perspective, arguing that managerial leadership effectiveness is measured not only by the achievement of administrative targets but also by leaders' ability to build subordinates' trust and affective commitment to the organization. This dimension is relevant to understanding why principal managerial competence may influence teacher job satisfaction more strongly than it directly affects technical-administrative indicators of education quality.

### **2.3 Educational Facilities**

Educational facilities refer to all physical resources that support the learning process, encompassing the dimensions of availability, adequacy, and management quality (Bafadal, 2019), as stipulated in Minister of National Education Regulation No. 24 of 2007. Chasovy et al. (2023) showed that the systematic implementation of educational facilities management can improve education quality in vocational schools, while Amalia

et al. (2025) demonstrated similar findings in madrasah settings. At the elementary school level, Akmalia et al. (2024) found that educational facilities services made a significant contribution to education quality and learning effectiveness at SD Negeri 060806 Medan. Yangambi (2023) added that the availability of adequate educational facilities was closely associated with student learning achievement in three public schools in developing countries, whereas Latifah and Muspawi (2023) examined the three variables in an integrated manner and found that educational facilities affected elementary school learning quality both directly ( $\beta = 0.298$ ) and through teacher job satisfaction ( $\beta = 0.187$ ).

The dimensions of educational facilities relevant to education quality in elementary education include the adequacy of learning spaces, the availability of libraries and learning resources, technology facilities and instructional media, sanitation facilities and the school environment, and the sustainable management and maintenance of facilities. These five dimensions are complementary because the availability of facilities alone cannot be optimal without an orderly maintenance system (Harini et al., 2024). In regions with budgetary constraints, such as Pandeglang Regency, efficient facilities management is essential to ensure that limited resources can still exert the greatest possible impact on the learning process.

#### **2.4 Teacher Job Satisfaction**

Teacher job satisfaction is defined as a positive psychological state experienced by teachers in relation to all aspects of their work, formed through subjective evaluations of intrinsic and extrinsic job factors based on Herzberg's Two-Factor Theory (Luthans & Youssef-Morgan, 2023; Robbins & Judge, 2023). According to this theory, hygiene factors, such as working conditions and interpersonal relationships, prevent dissatisfaction, whereas motivator factors, such as recognition and career development, foster deeper satisfaction. Ramli and Nisa (2023) found a positive relationship between principal managerial competence and teacher job satisfaction ( $r = 0.340$ ), which was followed by improved performance ( $r = 0.298$ ). In an international context, Wartenberg et al. (2023), through a meta-analysis, confirmed that teacher job satisfaction is consistently correlated with teaching performance across countries, while Muñoz-Troncoso and Riquelme (2025) found that the physical conditions of classrooms in Chile also shape teachers' perceptions of well-being and job satisfaction.

#### **2.5 Relevant Previous Studies**

Several recent studies further reinforce the conceptual framework of this study. Muttaqin, Tursina, Sudrajat, Yuliza, Novianto, Ramadhan, and Kurnanto (2023) found that principal managerial competence significantly affected teacher commitment and performance through the development of a supportive work climate. A cross-national study by Üztemur,

Gökulp, İlğan, and Dinç (2026), based on PISA 2022 data, demonstrated that school leadership behaviors consistently predicted organizational trust and teacher job satisfaction across educational contexts. Fessehatsion and Pai (2025) confirmed that managerial support contributed to teacher job satisfaction both directly and indirectly through self-efficacy as a mediator. Regarding the measurement of job satisfaction as a mediating variable, Harb, Fowler, Dhillon, Kim, and Tashtoush (2023) and Zebon, Sattar, and Ahamed (2025) demonstrated, using PLS-SEM, that job satisfaction consistently mediated the relationship between managerial practices or the work environment and educator performance outcomes.

Research on education quality has also been enriched by Kholifah, Nurtanto, Mutohhari, Subakti, Ramadhan, and Majid (2024), who found that motivation and professional development mediate vocational teacher performance, and by Karakose and Tülübas (2023), who linked digital leadership to the sustainability of school quality improvement. In the context of higher education in Tanzania, Krishnapillai (2023) showed that service quality affects student satisfaction, an analogy relevant to the relationship between school service quality and teacher job satisfaction. Meanwhile, Suwartini and Utama (2023) confirmed the input-process-output-outcome model in elementary school quality management, and Sulistyaningsih, Susilawati, Heryani, Tukiran, and Surata (2023) highlighted the importance of principal entrepreneurial competence in building a quality culture. Zulaikah, Akhyak, Muhajir, Effendi, and Rohmah (2024) provided a philosophical review of the concept of education quality, whereas Rostini, Khalifaturrahmah, Sulaiman, and Amaly (2023) found that effective principal conflict management also supports a conducive work climate. Zulfah (2023) provided evidence that leadership style and work motivation jointly affect teacher job satisfaction among civil servant teachers in vocational schools, and Harini, Zukhrufin, and Wahyusi (2024) emphasized the role of educational facilities management in supporting institutional education quality. Alonzo, Quimno, Townend, and Oo (2024) complemented this body of research by highlighting the importance of ICT-based data systems for evidence-based decision-making in schools, which is relevant to data-based governance in accredited schools.

#### **2.6 Conceptual Framework and Hypothesis Development**

Based on the theoretical review and empirical evidence above, the conceptual framework of this study is based on the assumption that education quality is the dependent variable influenced by principal managerial competence and educational facilities, both directly and through teacher job satisfaction as a mediating variable. Principals with strong managerial competence can effectively design school programs, efficiently allocate resources, and continuously implement monitoring and evaluation functions, ultimately directly affecting education

quality (H1). The availability of adequate educational facilities is a prerequisite for effective learning implementation and thus contributes to improved education quality (H2).

On the other hand, principals with strong managerial competence can create a supportive work environment and provide appropriate recognition to teachers, thereby increasing teacher job satisfaction (H3). A comfortable physical school environment supported by comprehensive learning facilities also enhances teacher job satisfaction (H4). Teacher job satisfaction arising from these two factors subsequently encourages teachers to work more optimally, thereby leading to improved education quality (H5). Thus, teacher job satisfaction is positioned as the mediating variable that bridges the effects of principal managerial competence (H6) and educational facilities (H7) on education quality. These seven hypotheses are formulated as follows:

H1: Principal managerial competence has a positive and significant direct effect on education quality.

H2: Educational facilities have a positive and significant direct effect on education quality.

H3: Principal managerial competence has a positive and significant effect on teacher job satisfaction.

H4: Educational facilities have a positive and significant effect on teacher job satisfaction.

H5: Teacher job satisfaction has a positive and significant direct effect on education quality.

H6: Teacher job satisfaction mediates the effect of principal managerial competence on education quality.

H7: Teacher job satisfaction mediates the effect of educational facilities on education quality.

These seven hypotheses form a partial mediation model that accommodates both the direct and indirect effects of the two exogenous variables on education quality through teacher job satisfaction as the mediating variable.

### 3. RESEARCH METHODOLOGY

This study employed a quantitative approach with an explanatory survey design, namely, a survey intended to explain causal relationships among variables rather than merely describe the current state of a phenomenon (Sugiyono, 2023). The analytical framework used was a mediation model, in which teacher job satisfaction served as the mediating variable that bridged the effects of principal managerial competence (X1) and educational facilities (X2) on education quality (Y). The study was conducted in public elementary schools throughout Pandeglang Regency, Banten Province, from February to June 2026, encompassing the preparation phase, instrument piloting, field data collection, data processing, and report writing.

The study population comprised all teachers in A-accredited public elementary schools (SDN) in Pandeglang Regency, distributed across 12 subdistricts and including 19 A-accredited

SDN, totaling 183 teachers, excluding principals. A-accredited schools were selected to control for confounding variables, thereby enabling comparisons across schools with relatively equivalent education quality standards verified by the National Accreditation Board for Primary and Secondary Education. Teachers, rather than principals, were selected as the unit of analysis because they interact directly with principals on a daily basis and were therefore considered better able to provide objective assessments of principal managerial competence, the condition of educational facilities, teacher job satisfaction, and education quality in their schools.

The sample size was determined using the Slovin formula with a 5% margin of error, yielding  $n = 183 / (1 + 183 \times .05^2) \approx 125$  respondents. Probability sampling using a stratified random sampling approach was employed, with each subdistrict treated as a stratum to ensure proportional representation of all study areas. Respondent criteria included being an active teacher (civil servant or P3K) at a public elementary school in Pandeglang Regency, having served at the same school for at least one year, and being willing to participate voluntarily.

The operationalization of the four study variables into measurable dimensions and indicators is summarized in Table 4. Principal managerial competence was operationalized through the dimensions of program planning, resource organization, mobilization and empowerment, facilities and budget management, and supervision and evaluation. Educational facilities encompassed the dimensions of learning-space adequacy, library availability, technology and media resources, sanitation facilities, and management and maintenance. Teacher job satisfaction was operationalized through the dimensions of satisfaction with principal leadership, working-environment conditions, relationships with colleagues, and recognition and career development, with reference to Herzberg's Two-Factor Theory. Education quality was operationalized through the dimensions of graduate competency standards, learning process standards, school management standards, standards for educators and educational personnel, and stakeholder satisfaction.

**Table 4.** Operationalization of Study Variables

| Variable                             | Dimensions                                                    | Number of Items |
|--------------------------------------|---------------------------------------------------------------|-----------------|
| Principal Managerial Competence (X1) | Planning; Organizing; Mobilizing; Management; Supervision     | 15              |
| Educational Facilities (X2)          | Learning spaces; Library; Technology; Sanitation; Maintenance | 15              |
| Teacher Job                          | Principal leadership; Working                                 | 15              |

| Variable              | Dimensions                                                                                    | Number of Items |
|-----------------------|-----------------------------------------------------------------------------------------------|-----------------|
| Satisfaction (Z)      | environment; Colleagues; Career development                                                   |                 |
| Education Quality (Y) | Graduate competencies; Process; Management; Educators and educational personnel; Stakeholders | 15              |

Source: Minister of National Education Regulation No. 13 of 2007; Bafadal, 2019; Robbins & Judge, 2023; Government Regulation No. 57 of 2021 (processed by the researchers)

Data were collected through a closed-ended questionnaire using a 1–5 Likert scale (1 = strongly disagree to 5 = strongly agree) comprising 60 statement items covering the four study variables. Before use, the instrument was pilot-tested with 30 teachers outside the study sample to assess content validity through expert judgment by two educational management academics and construct validity using Pearson product-moment correlations (an item was considered valid when  $r_{\text{calculated}} \geq r_{\text{table}} = .361$  at  $n = 30$ ). The instrument's preliminary reliability was tested using Cronbach's alpha coefficient with Statistical Package for the Social Sciences (SPSS) version 25 software, using a threshold of  $\alpha \geq .70$  (Nunnally, 1978).

Data analysis was conducted in two stages. First, descriptive statistics were used to describe the data distribution characteristics for each variable, including the mean, median, mode, and standard deviation. Second, inferential analysis was conducted using Partial Least Squares Structural Equation Modeling (PLS-SEM), using SmartPLS version 4 and supported by Microsoft Excel for data preparation and coding before importation. The selection of PLS-SEM was based on the predictive nature of the study model with reflective latent constructs, a sample size meeting the minimum PLS-SEM threshold, the absence of a strict requirement for multivariate normality, and the capability of PLS-SEM to estimate direct and indirect effects simultaneously (Hair, Risher, Sarstedt, & Ringle, 2019).

Field data collection was conducted through several systematic stages. First, the researchers obtained official research permission from the Education and Culture Office of Pandeglang Regency and the principals at each research site. Second, the researchers explained the study objectives and procedures to prospective respondents and assured them of the confidentiality of their identities in accordance with research ethics principles. Third, the questionnaires were distributed directly by the researchers or through designated coordinators at each school. Fourth, the completed questionnaires were collected by the agreed deadline and checked for the completeness and consistency of responses before being entered into the database. In addition to the primary questionnaire data,

the researchers reviewed secondary documents, including school institutional profiles, accreditation data summaries from the National Accreditation Board for Elementary and Secondary Education, and educational facilities data from Dapodikdasmien, to enrich the context for interpreting the findings.

Evaluation of the measurement model (outer model) included convergent validity testing using outer loading values ( $\geq 0.70$ ) and Average Variance Extracted ( $AVE \geq 0.50$ ), as well as discriminant validity testing using the Fornell-Larcker criterion and the Heterotrait-Monotrait ratio ( $< 0.85$ ). Construct reliability was evaluated using Composite Reliability ( $\geq 0.70$ ). Evaluation of the structural model (inner model) included the coefficient of determination ( $R^2$ ), predictive relevance ( $Q^2$ ) through the blindfolding procedure, and hypothesis testing using path coefficients with a bootstrapping procedure involving 5,000 subsamples. A hypothesis was accepted if the  $t$  statistic exceeded 1.96 and  $p < .05$  in two-tailed testing. For mediation effect testing, statistical decisions also considered whether the 95% confidence interval obtained through bootstrapping excluded zero (Preacher & Hayes, 2008) and followed the mediation classification criteria of Hair et al. (2019): partial mediation occurred when both direct and indirect effects were significant, whereas full mediation occurred when only the indirect effect was significant.

## 4. Results and Discussion

### 4.1 Characteristics of the Research Data

This study involved 125 teachers from public elementary schools in Pandeglang Regency, who were proportionally distributed across the 12 subdistricts included as research sites according to the stratified random sampling technique applied. This distribution of respondents represented the diverse geographic conditions of Pandeglang Regency, encompassing its northern, central, southern, and eastern areas; thus, the recorded perceptions were expected to provide a more comprehensive depiction of the actual conditions of elementary education in the regency. Data were collected using 60 statement items covering four variables: principal managerial competence (KM), educational facilities (SP), teacher job satisfaction (KKG), and education quality (MP), each comprising 15 items measured on a 1–5 Likert scale. Table 1 presents a summary of the descriptive statistics for these four variables.

Table 1. Descriptive Statistics of the Study Variables

| Variable                             | Items | Min | Max | Mean  | SD   | Category    |
|--------------------------------------|-------|-----|-----|-------|------|-------------|
| Principal Managerial Competence (KM) | 15    | 20  | 73  | 45,20 | 9,46 | Fairly good |
| Education                            | 15    | 2   | 74  | 42,   | 9,   | Fairly      |

| Variable                       | Items | Mean | Max | Median | SD   | Category    |
|--------------------------------|-------|------|-----|--------|------|-------------|
| Physical Facilities (SP)       |       | 2    |     | 56     | 33   | good        |
| Teacher Job Satisfaction (KKG) | 15    | 17   | 72  | 45,54  | 9,76 | Fairly good |
| Education Quality (MP)         | 15    | 22   | 70  | 46,67  | 9,51 | Fairly good |

Source: Processed primary data, 2026

The mean scores for all four variables fell within the fairly good to good categories, with educational facilities showing the lowest mean score (42.56), consistent with the preliminary findings in the introduction that schools' physical facilities remained a weakness relative to the other three variables. Item-level normality testing showed skewness values ranging from -0.574 to 0.483 and excess kurtosis values ranging from -0.571 to 1.02, well below the  $\pm 2.0$  threshold commonly used as the criterion for univariate normality; therefore, the data were considered not to exhibit serious violations of normality.

#### 4.2 Measurement Model Evaluation (Outer Model)

The convergent validity test results showed that all 60 indicators had outer loading values ranging from 0.689 to 0.852. Most indicators exceeded the 0.70 threshold, except for two indicators in the principal managerial competence construct (KM9 = 0.689 and KM13 = 0.698), which were marginal but retained because they exceeded the 0.65 tolerance threshold and were conceptually important for the completeness of the construct dimensions. Table 2 presents a summary of construct reliability and average variance extracted.

Table 2. Construct Reliability and Average Variance Extracted (AVE)

| Construct                            | Cronbach's Alpha | Composite Reliability | AVE   |
|--------------------------------------|------------------|-----------------------|-------|
| Principal Managerial Competence (KM) | 0,946            | 0,952                 | 0,569 |
| Educational Facilities (SP)          | 0,955            | 0,960                 | 0,613 |
| Teacher Job Satisfaction (KKG)       | 0,954            | 0,959                 | 0,611 |

| Construct              | Cronbach's Alpha | Composite Reliability | AVE   |
|------------------------|------------------|-----------------------|-------|
| Education Quality (MP) | 0,952            | 0,957                 | 0,598 |

Source: Processed primary data using SmartPLS version 4, 2026

All constructs showed composite reliability values above 0.95 and AVE values above 0.50, confirming excellent reliability and convergent validity. These relatively high reliability values should be interpreted cautiously, given that each construct was developed from indicators encompassing broad conceptual dimensions; thus, they are more appropriately interpreted as evidence of strong internal consistency of the instrument than as indications of item redundancy (Becker, Cheah, Gholamzade, Ringle, & Sarstedt, 2023). The discriminant validity test using the Fornell–Larcker criterion also showed that the square root of the AVE for each construct (ranging from 0.754 to 0.783) was greater than the correlations between constructs, thereby demonstrating adequate discriminant validity and confirming that each construct distinctly measured its respective dimension.

#### 4.3 Structural Model Evaluation (Inner Model)

The structural model evaluation results showed that the R-square value for teacher job satisfaction was 0.901, indicating that 90.1% of the variation in teacher job satisfaction could be explained by principal managerial competence and educational facilities. Meanwhile, the R-square value for education quality was 0.883, indicating that 88.3% of the variation in education quality was jointly explained by principal managerial competence, educational facilities, and teacher job satisfaction. These R-square values exceeding 0.75 indicate very strong explanatory power of the model (Hair et al., 2019). The Q-square values from the blindfolding procedure were also positive for both endogenous constructs (0.542 for teacher job satisfaction and 0.618 for education quality), confirming that the model had good predictive relevance.

#### 4.4 Hypothesis Testing

The seven hypotheses were tested using a bootstrapping procedure with 5,000 subsamples. Table 3 summarizes the path coefficients, t-statistics, and p-values for each hypothesized path.

Table 3. Hypothesis Testing Results (Path Coefficients)

| Hypothesis | Path | Coefficient (β) | t-Statistic | p-Value | Conclusion |
|------------|------|-----------------|-------------|---------|------------|
| H1         | K    | 0,2             | 3,941       | 0,0     | Accepted   |

| Hypot<br>thesis | Pat<br>h      | Co<br>effici<br>ent<br>( $\beta$ ) | t-<br>Statistic | p-<br>Value | Conclusio<br>n               |
|-----------------|---------------|------------------------------------|-----------------|-------------|------------------------------|
|                 | M → MP        | 74                                 |                 | 00          |                              |
| H2              | SP → MP       | 0,258                              | 4,635           | 0,000       | Accepted                     |
| H3              | KM → KKG      | 0,658                              | 18,220          | 0,000       | Accepted                     |
| H4              | SP → KKG      | 0,552                              | 12,397          | 0,000       | Accepted                     |
| H5              | KKG → MP      | 0,536                              | 6,184           | 0,000       | Accepted                     |
| H6              | KM → KKG → MP | 0,352                              | 5,899           | 0,000       | Accepted (partial mediation) |
| H7              | SP → KKG → MP | 0,296                              | 5,542           | 0,000       | Accepted (partial mediation) |

Source: SmartPLS version 4 bootstrapping results, 5,000 subsamples, 2026

All seven hypothesized paths were significant at  $p < .001$ , with t-statistics far exceeding the critical value of 1.96; therefore, H1 through H7 were all accepted. The pattern of path coefficients indicates that the effects of principal managerial competence and educational facilities on teacher job satisfaction ( $\beta = 0.658$  and  $0.552$ ) were substantially stronger than their direct effects on education quality ( $\beta = 0.274$  and  $0.258$ ). The indirect effects through teacher job satisfaction ( $H6 = 0.352$  and  $H7 = 0.296$ ) were also greater than the direct effects ( $H1 = 0.274$  and  $H2 = 0.258$ ), indicating that the two exogenous variables predominantly influence education quality indirectly by enhancing teacher job satisfaction. Because the direct effects remained significant after the mediating paths were taken into account, teacher job satisfaction served as a partial mediator in this model rather than a full mediator.

#### 4.5 Discussion

##### 4.5.1 Effects of Principal Managerial Competence on

##### Education Quality and Teacher Job Satisfaction

Principal managerial competence had a significant positive effect on education quality ( $H1: \beta = 0.274; t = 3.941$ ) and an even stronger effect on teacher job satisfaction ( $H3: \beta = 0.658; t = 18.220$ ). Competent principals can strategically plan programs, appropriately allocate resources, empower teachers, and conduct supervision and evaluation fairly, thereby increasing teachers' trust and sense of being valued in their work. This finding is consistent with Mustakim, Akbar, and Sulistyorini (2024), who demonstrated that principal managerial competence affects teacher performance, which ultimately contributes to school quality, and reinforces the argument of Muttaqin et al. (2023) that managerial competence fosters a work climate conducive to teacher commitment. The cross-national study by Üztemur, Gökalep, İlğan, and Dinç (2026) further confirmed that school leadership behaviors consistently predict teacher job satisfaction across diverse educational contexts, whereas Fessehatsion and Pai (2025) showed that principals' managerial support contributes to job satisfaction both directly and through teacher self-efficacy. Notably, the magnitude of the indirect effect of principal managerial competence on education quality through teacher job satisfaction ( $\beta = 0.352$ ) exceeded its direct effect ( $\beta = 0.274$ ), indicating that the effect of managerial competence on education quality is more optimal when principals first succeed in enhancing teacher job satisfaction rather than relying solely on structural and administrative pathways.

##### 4.5.2 Effects of Educational Facilities on Education Quality and Teacher Job Satisfaction

Educational facilities also had significant effects on both education quality ( $H2: \beta = 0.258; t = 4.635$ ) and teacher job satisfaction ( $H4: \beta = 0.552; t = 12.397$ ). The availability of adequate classrooms, active libraries, functioning computer laboratories, and sufficient sanitation facilities enables learning processes to proceed more effectively while making teachers feel more supported in performing their duties. These results reinforce the findings of Yangambi (2023), who found that adequate school infrastructure is associated with student learning achievement, as well as those of Akmalia, Harahap, Munawwarah, Zulqaidah, and Margolang (2024), who demonstrated the significant contribution of educational facilities services to education quality in public elementary schools. Within Herzberg's Two-Factor Theory framework, educational facilities function as essential hygiene factors in preventing job dissatisfaction (Luthans & Youssef-Morgan, 2023). Consistent with the pattern observed for principal managerial competence, the indirect effect of educational facilities on education quality through teacher job satisfaction ( $\beta = 0.296$ ) was also greater than its direct effect ( $\beta = 0.258$ ), indicating that investments in improving schools' physical facilities have a more optimal effect on education quality when

accompanied by simultaneous strategies to enhance teacher job satisfaction.

#### **4.5.3 Effects of Teacher Job Satisfaction on Education Quality and Its Mediating Role**

Teacher job satisfaction had a significant positive effect on education quality (H5:  $\beta = 0.536$ ;  $t = 6.184$ ), making it the second-strongest predictor in the model after the effect of principal managerial competence on teacher job satisfaction. Teachers who are satisfied with their work, including their relationships with principals, working environment conditions, collegial relationships, and career development opportunities, tend to be more dedicated and consistent in delivering high-quality instruction. This finding is consistent with the meta-analysis by Wartenberg, Aldrup, Grund, and Klusmann (2023), which confirmed a consistent relationship between teacher job satisfaction and teaching performance across contexts. Further mediation testing showed that teacher job satisfaction significantly mediated the effects of principal managerial competence (H6:  $\beta = 0.352$ ;  $t = 5.899$ ) and educational facilities (H7:  $\beta = 0.296$ ;  $t = 5.542$ ) on education quality. Because the direct effects of both exogenous variables (H1 and H2) remained significant after the mediation paths were considered, the mediation was partial, consistent with the findings of Harb, Fowler, Dhillon, Kim, and Tashtoush (2023), who demonstrated that job satisfaction consistently mediates the relationship between managerial practices and educator performance outcomes across diverse educational settings. Latifah and Muspawi (2023) also identified a similar mediation pattern in the context of educational facilities and elementary school learning quality in West Nusa Tenggara, reinforcing the generalizability of the findings across regions.

#### **4.5.4 Practical Implications for Elementary Education Policy**

The finding that teacher job satisfaction served as a partial mediator with a greater contribution than the direct paths has significant practical implications for elementary education stakeholders. For the Pandeglang Regency Education Department, these results indicate that budget allocations for developing principal managerial competence and providing educational facilities need to be balanced with programs that explicitly target teachers' psychological well-being, for example, by strengthening reward systems, clarifying career pathways, and establishing regular communication forums between principals and teachers. Sulistyaniningsih, Susilawati, Heryani, Tukiran, and Surata (2023) showed that principals' entrepreneurial competence, one component of which is the ability to build a participatory work culture, also shapes an organizational climate that supports educators' job satisfaction. This finding reinforces the argument that principal development programs should ideally focus not only on technical-

administrative competence but also on relational capacity and humane leadership.

For principals, these findings underscore the importance of balancing administrative responsibilities with their role as mentors who listen to teachers' needs. Rostini, Khalifaturramah, Sulaiman, and Amaly (2023) found that principals' effectiveness in managing conflict also supports a conducive work climate, a capacity that is relevant given that teacher job satisfaction in this study was also shaped by dimensions related to relationships with colleagues and principal leadership. Meanwhile, for teachers, these findings may provide a basis for collective advocacy to express their needs for professional development and improved working conditions to their schools and relevant education departments.

The pattern of findings in this study also enriches the discussion of the role of teacher job satisfaction within the broader framework of education quality management. Krishnapillai (2023), although in the context of higher education, showed that the quality of institutional services affects service recipients' satisfaction, which in turn shapes perceptions of overall quality. By analogy, this logic also applies to the relationship between managerial support or educational facilities and teacher job satisfaction among teachers as internal "service recipients" within the school organization. Similarly, in their philosophical review, Zulaikah, Akhyak, Muhajir, Effendi, and Rohmah (2024) emphasized that education quality cannot be reduced solely to academic achievement but also encompasses process quality and the well-being of all parties involved, including teachers as key actors in the learning process. This perspective provides a philosophical foundation for this study's finding that the path toward sustainable education quality needs to involve strengthening the human dimensions of school organizations rather than merely meeting technical standards.

#### **4.5.6 Overall Model Interpretation**

Overall, all seven research hypotheses were statistically significant ( $p < .001$ ), indicating that the data consistently supported the proposed theoretical propositions. The research model demonstrated that the relationship between the exogenous variables (principal managerial competence and educational facilities) and the outcome variable (education quality) operated through two complementary mechanisms: direct structural-administrative effects and indirect effects through enhanced teacher job satisfaction. The substantial contribution of teacher job satisfaction as a mediating variable, reflected in its direct effect on education quality ( $\beta = 0.536$ ) and its contribution to the two mediation paths, suggests that policies to improve education quality cannot focus solely on strengthening principal managerial competence and providing educational facilities; they must also explicitly address teachers' psychological well-being as a primary link to improved education quality. This

implication is consistent with the paradigm shift in contemporary education quality management, which increasingly emphasizes human-centered approaches alongside structural-bureaucratic approaches (Karakose & Tülübas, 2023; Kholifah et al., 2024).

## 5. Conclusion

### 5.1 Conclusion

Based on the PLS-SEM analysis of 125 teachers from A-accredited public elementary schools in Pandeglang Regency, this study concludes that principal managerial competence and educational facilities each had positive and significant effects on education quality, both directly and indirectly through teacher job satisfaction. The effects of these two exogenous variables on teacher job satisfaction were substantially stronger than their direct effects on education quality, indicating that teacher job satisfaction serves as the primary pathway linking managerial leadership and the availability of educational facilities to education quality outcomes. Teacher job satisfaction was found to partially mediate both relationships, confirming that principal managerial competence and educational facilities continued to contribute directly to education quality beyond the pathway of enhanced teacher job satisfaction. The research model demonstrated very strong explanatory power, with an  $R^2$  of 0.901 for teacher job satisfaction and an  $R^2$  of 0.883 for education quality, and can therefore serve as an empirical basis for formulating more integrated policies to improve elementary education quality.

Theoretically, these findings reinforce the relevance of Herzberg's Two-Factor Theory in the context of school organizations while underscoring that managerial leadership and the adequacy of physical facilities operate complementarily through the psychological pathway of teacher job satisfaction to shape education quality. This contribution complements educational leadership frameworks that have largely emphasized the direct relationship between leadership and organizational performance without explicitly modeling the psychological mediation mechanism of teacher job satisfaction as the primary link.

### 5.2 Limitations

This study has several limitations that should be considered when interpreting its findings. First, the study population was limited to teachers in A-accredited public elementary schools; therefore, the findings may not apply to schools with different accreditation ratings, whose conditions tend to be more varied, including schools that have not been accredited and may exhibit different dynamics in the relationships among variables. Second, the cross-sectional research design captured conditions at only one point in time; therefore, it could not explain changes in the relationships among variables over time or definitively establish causal relationships in the experimental sense. Third, data were

collected through teachers' self-reported perceptions, which may have contained subjective bias or a tendency to provide socially desirable responses (social desirability bias), although the instrument had undergone adequate validity and reliability tests. Fourth, the study's geographic scope, which was limited to one regency, restricts the generalizability of the findings to different geographic, social, organizational, cultural, and institutional contexts. Fifth, the research model did not include other contextual variables that may also influence education quality, such as student characteristics, parental support, or education policies at the provincial level; therefore, the proportion of unexplained variance (residual) should be interpreted cautiously.

### 5.3 Recommendations

Based on the conclusions and limitations above, this study offers several recommendations. The Pandeglang Regency Education Department is recommended to develop a sustainable principal managerial competence development program and establish a realistic and measurable roadmap for meeting standards for educational facilities, accompanied by specific programs focused on improving teacher job satisfaction through enhanced well-being, career development pathways, and fair reward systems. Principals are recommended to develop human resource management strategies oriented toward teacher empowerment and the creation of a harmonious work climate, in line with efforts to gradually improve school educational facilities. Future researchers are recommended to expand the geographic scope and educational levels examined, use longitudinal designs to capture the dynamics of changes among variables, and explore other mediating or moderating variables, such as teacher self-efficacy and school culture, to enrich the explanatory model of education quality.

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