

## **Increasing School Administrator Competency in Indonesia: Determinant Factors to Consider**

Andi Wahed

Bambang Budi Wiyono

Ali Imron

Ahmad Yusuf Sobri

*Universitas Negeri Malang, Indonesia*

---

### **ABSTRACT**

This study explores the role of school administrative staff and highlights the importance of professional improvement training in the era of the Industrial Revolution 4.0. Using a survey method, data were collected from 775 respondents across various regions in Indonesia. Data analysis was conducted using exploratory factor analysis (EFA). The results identified three core factors of administrative staff competence in Indonesian schools: motivation for competence development, core understanding and foundational skills, and core functional competencies of school administration. These findings underscore the multidimensional nature of school administrative roles, which require not only technical skills and task-based knowledge but also intrinsic motivation for continuous professional growth. The high factor loadings on items related to digital skills and professional self-development suggest that administrative staff are not merely operational support personnel but are essential actors in the broader ecosystem of school effectiveness. Their competencies directly impact the efficiency of school management, the accuracy of data and information systems, and the responsiveness of schools to policy and technological change. The results affirm the relevance of adopting a competency-based approach in managing, training, and supporting school administrative personnel. This study contributes to the literature by offering an empirically validated structure for understanding the competencies required in modern school administrative functions, particularly in contexts undergoing digital and systemic reform.

**Keywords:** determinant factors, increasing competency, school administrative staff, school administrators, educational management

---

As times change, traditional educational methods are becoming less relevant, necessitating strategies that effectively incorporate technology and modern management to increase the success of educational institutions (Khosrow-Pour, 2021). In the era of Industry 4.0, these changes are closely aligned with the concept of Society 5.0, first introduced in Japan, which envisions a technology-driven society characterized by extensive digital transformation (Alvarez-Cedillo et al., 2019; Darmaji et al., 2019; Icela et al., 2023; Polat & Erkollar, 2021; Salimova et al., 2020). The rapid advancement of technology has significantly changed the way school administrative staff work, enabling them to perform their tasks more efficiently, accurately, and in an integrated manner (Winarno et al., 2020; Wiyono et al., 2021).

Within the changing educational landscape, school administrative staff occupy a critical yet often undervalued position. They are responsible for a wide range of tasks that ensure the smooth daily functioning of schools, thereby creating an environment that fosters productivity among students, teachers, and other stakeholders (Biçer, 2014; Fischer, 2016; Vizehfar & Torabizadeh, 2018; Waziana et al., 2022; Wiyono et al., 2021). Previous studies have demonstrated that the competence and motivation of school administrative staff are closely linked to their performance, which in turn influences student achievement and overall school effectiveness (Jeno et al., 2023; Yalçinkaya et al., 2021; Yulianti, 2021). This

underscores the importance of educational resource management, which aims to optimize the use of human resources, facilities, finances, curriculum, and technology to achieve institutional goals (Alvaro & Triwiyanto, 2024; Kowalski, 2012; Nwuke, 2021).

However, the increasing demands placed on schools have also reshaped the roles of educational leaders. While accountability pressures and a stronger focus on outcomes have transformed school administration in many countries (Starr, 2021), research shows that principals often spend a disproportionate amount of time on managerial and bureaucratic tasks, leaving limited capacity for instructional leadership (Anselmus Dami et al., 2022; Hallinger et al., 2018). To address this challenge, initiatives such as the School Administration Manager (SAM) model have been developed to reallocate managerial duties away from principals, allowing them to devote more attention to the learning process (Goldring et al., 2020; Sheng et al., 2017).

Similar trends toward the professionalization of school administration roles can be seen internationally. In the United States and the United Kingdom, for example, “School Business Managers” or “School Business Leaders” have emerged as specialized professionals with responsibilities spanning finance, human resources, and operations (Creaby, 2021; Woods, 2014). Despite their growing importance, limited scholarly attention has been paid to the challenges these professionals face or to the institutional support needed for their continued development (Armstrong & Rayner, 2021).

In Indonesia, the situation is further complicated by the perception of school administrative staff as subordinate support personnel with limited decision-making authority (Bayat & Fataar, 2020). This perception has contributed to insufficient investment in their training and professional development (Nafi’a et al., 2024; Rodriguez et al., 2021; Suryana et al., 2018), even though their work is essential for the smooth and effective operation of schools (Farradiba et al., 2024; Lumungga & Bafadal, 2024; Umnia et al., 2024). Strengthening their competencies is therefore not merely a matter of operational efficiency, but a strategic priority for improving school performance as a whole (Sa’diyah et al., 2024).

## **Operational Definitions**

For the purpose of this study, competency is operationalized as the measurable knowledge, skills, and attitudes required by school administrative staff to effectively perform their professional roles. Competency is treated not as a singular ability but as a multidimensional construct encompassing motivational, cognitive, technical, and functional domains. A determinant factor is defined as a latent construct identified through factor analysis that significantly influences the development of school administrative staff competency. Each factor is operationalized as a set of interrelated variables with high factor loadings, indicating that they collectively drive competency formation.

## **Significance of the Study**

This research serves as a crucial first step in developing the capacity of school administrative staff by using factor analysis to identify and analyze the determinant factors that shape their competencies. By doing so, this study directly addresses the limited scholarly attention given to their roles and aims to provide a clear foundation for professional development frameworks, policy decisions, and strategies that support principals in focusing on instructional leadership. Furthermore, these findings can offer practical insights for local governments and schools in Indonesia, ultimately enhancing the professional capacity of administrative staff and contributing to improved educational outcomes and broader school management reform.

## **Research Objectives and Questions**

Building on these gaps, the objectives of this study are:

1. To identify the underlying latent constructs (determinant factors) influencing the competencies of school administrative staff.
2. To categorize these competencies into multidimensional domains, including motivational, cognitive, technical, and functional aspects.
3. To provide a theoretical and practical framework for strengthening the professional development of school administrative staff within the education system.

Based on these objectives, the study seeks to answer the following research questions:

- RQ1: What determinant factors underlie the competency of school administrative staff?
- RQ2: How can these competencies be categorized into distinct, multidimensional domains?

- RQ3: What are the implications of these determinant factors for the professional development and effectiveness of school administrative staff in educational institutions?

## **METHODS**

### **Research Design**

In this research, a cross-sectional survey design was implemented to examine the responsibilities of school administrative staff and identify the key factors contributing to their competence development in Indonesia. The study then applied exploratory factor analysis (EFA) to uncover the latent factor structure of administrative competence (Watkins, 2018; Yong & Pearce, 2013). EFA is a statistical technique employed in the absence of prior theoretical assumptions or hypotheses about the data structure. Its primary objective is to identify latent patterns or structures within a set of observed variables, reduce dimensionality by grouping correlated variables into key factors, and reveal the underlying constructs that account for the observed data (Alavi et al., 2020; Goretzko et al., 2021; Lorenzo-Seva, 2021; Rogers, 2022; Watkins, 2018).

### **Participants**

The target population included school principals, teachers, and administrative staff from various schools in Indonesia. A total of 775 respondents were selected through simple random sampling to ensure representation across different school roles. The sample, consisting of school principals, teachers, and administrative staff, provided their perceptions of the competence development needs of school administrative staff. According to Comrey and Lee (2013), a sample size above 500 is considered "very good" for factor analysis (Comrey & Lee, 2013), thus confirming that the 775 respondents provided robust data for the EFA.

### **Instrument**

The instrument was a self-developed questionnaire consisting of 18 items designed to measure perceptions of the need to improve the competence of school administrative staff. To assess participants' perceptions, a 5-point Likert scale was used, anchored by 1 (strongly disagree) and 5 (strongly agree). The instrument was developed based on a review of the literature on school administration and competence development and was reviewed by educational experts to ensure content validity (DeVellis, 2017).

### **Data Analysis**

Data analysis was performed using Factor software (version 12.06.08 x64bits). This freely available software, developed by the Department of Psychology at the Universitat Rovira i Virgili Tarragona, Spain, can be accessed through its official website (Ferrando & Lorenzo-Seva, 2017). Prior to the analysis, the dataset's readiness for factor analysis was examined using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's test of sphericity. In addition to the overall KMO, the individual measure of sampling adequacy (MSA) was calculated for each item. In this study, we report the Normed MSA values, a specialized version of the MSA index provided by the Factor software (version 12.06.08), to ensure that each item has sufficient correlation with other items.

While KMO provides an overall index for the entire dataset, the MSA is a variable-specific index that identifies whether a particular item belongs to the same construct as other variables. A KMO value greater than 0.6 and a significant Bartlett's test ( $p < .05$ ) indicated that the data were appropriate for factor analysis (Field, 2024; Nkansah, 2018). Items with a Normed MSA value below 0.50 were considered for exclusion from the analysis, as such a value suggests insufficient correlation with other items (Lorenzo-Seva & Ferrando, 2021).

The optimal number of factors was determined primarily using parallel analysis (Horn, 1965), widely recognized as the most accurate and recommended method for factor retention (Rogers, 2022). Principal component analysis (PCA) was used for factor extraction (Fabrigar et al., 1999), followed by promax rotation to allow for correlated factors (Lorenzo-Seva & Ferrando, 2019). Community values exceeding 0.40 were considered sufficient, indicating that the corresponding variables were well represented by the extracted factors (Cramer & Howitt, 2004; Hogarty et al., 2005; Mundfrom et al., 2005; Tabachnick et al., 2019). Consistent with established practice, the rotated loading matrix presents the factor loadings, and items with factor loadings below 0.4 were excluded to ensure a clear factor structure (Costello & Osborne, 2005; Hair et al., 2013).

## RESULTS

### Assessment of Factorability

Prior to conducting the EFA, we rigorously assessed the dataset's suitability for factor extraction, following the criteria specified in the data analysis section. We used multiple established criteria for this assessment, including the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy, Bartlett's test of sphericity, and the individual MSA for each item, as defined in the data analysis section. These preliminary tests are crucial for determining whether the observed correlations among variables are significant enough to warrant a factor-analytic approach. The calculated KMO value was 0.9086. This exceptionally high value, exceeding the commonly accepted threshold of 0.80 ("meritorious") and 0.90 ("marvelous") (Kaiser, 1974), indicates a high degree of common variance among the observed variables and strongly confirms the appropriateness of the data for factor analysis as planned in the methodology.

Additionally, a statistically significant result was found from Bartlett's test of sphericity (Approximate  $\chi^2 = 28832.3$ ,  $df = 153$ ,  $p < 0.00001$ ). This significant finding affirms the presence of significant correlations among the variables and supports the utility of factor analysis for dimensionality reduction. In addition to these overall tests, the individual normed MSA values for each item were examined to ensure their unique contribution and appropriateness within the factor structure. As presented in Table 1, all 18 items demonstrated very high Normed MSA values, ranging from 0.85 to 0.95.

**Table 1**

**The Individual Normed MSA Values**

Items	Normed MSA	Conclusion
Data Management Skills	**0.86	Meritorious
Understanding of School Policies	**0.90	Marvelous
Understanding of Main Duties and Functions	**0.91	Marvelous
Technology Skills	**0.85	Meritorious
Financial Administration Competence	**0.89	Meritorious
Communication Skills	**0.92	Marvelous
Public Relations Administration Competence	**0.95	Marvelous
Enhancement of Knowledge and Skills	**0.94	Marvelous
Upgrade of Current Understanding	**0.89	Meritorious
Need for Digital Competence Development	**0.92	Marvelous
Impact of Competence Development	**0.94	Marvelous
Curriculum Administration Competence	**0.91	Marvelous
Desire to Improve Digital Competence	**0.92	Marvelous
Facilities and Infrastructure Administration	**0.92	Marvelous
Student Administration Competence	**0.90	Meritorious
Personnel Administration Competence	**0.92	Marvelous
Correspondence Administration Competence	**0.90	Marvelous
Digital Archiving Competence	**0.91	Marvelous

As illustrated in Table 1, the lowest individual MSA value was 0.85 (Technology Skills), while the highest was 0.95 (Public Relations Administration Competence). These consistently high values, all well above the desirable threshold of 0.70, further underscore the excellent suitability of each variable for inclusion in the factor analysis and indicate that no items require removal due to poor sampling adequacy or insufficient shared variance.

### Factor Retention

Analysis was conducted using Factor software (version 12.06.08 x64-bit), which generated 775 random correlation matrices via permutation of the raw data (Buja & Eyuboglu, 1992). The parallel analysis specifically utilized polychoric correlation matrices, appropriate for the nature of the data. Table 2 displays the real-data eigenvalues, as well as the mean and 95<sup>th</sup>-percentile eigenvalues from random datasets. Following the standard for factor retention in parallel analysis, only factors with a real-data eigenvalue exceeding the corresponding 95th percentile random eigenvalue were kept.

**Table 2**

**Results of Parallel Analysis for Factor Retention**

Variable	Real-data Eigenvalues	Mean of random Eigenvalues	95 Percentile of Random Eigenvalues
1	8.83*	1.36	1.43
2	3.65*	1.30	1.34
3	1.65*	1.24	1.28
4	0.57	1.20	1.24
5	0.52	1.15	1.19
6	0.40	1.12	1.15
7	0.35	1.08	1.11
8	0.33	1.04	1.07
9	0.26	1.01	1.04
10	0.24	0.97	1.00
11	0.23	0.94	0.97
12	0.21	0.91	0.94
13	0.18	0.87	0.90
14	0.15	0.84	0.87
15	0.14	0.80	0.83
16	0.12	0.77	0.80
17	0.11	0.72	0.76
18	0.08	0.67	0.71

*Note.* Real-data eigenvalues were obtained from a principal component analysis. The asterisk (\*) indicates that the real-data eigenvalue is greater than the 95<sup>th</sup> percentile random eigenvalue, suggesting that the corresponding factor should be retained. The advised number of dimensions is 3.

Based on this criterion, three factors were identified as statistically meaningful. The analysis revealed that Factor 1 exhibited a real-data eigenvalue of 8.83, significantly exceeding its 95<sup>th</sup>-percentile random eigenvalue of 1.43. Factor 2 had a real-data eigenvalue of 3.65, significantly exceeding its 95<sup>th</sup>-percentile random eigenvalue of 1.34273. For Factor 3, the real-data eigenvalue was 1.65, exceeding the corresponding 95<sup>th</sup>-percentile random eigenvalue of 1.28. For Factor 4 and subsequent factors, the real-data eigenvalues were consistently lower than their respective 95th percentile random eigenvalues, indicating that these factors explained no more variance than would be expected by chance. These findings are further corroborated by the Factor software's direct advisement of three dimensions. Therefore, the parallel analysis unequivocally supported the extraction of a three-factor solution.

**Unrotated Factor Loading Matrix and Communalities**

Following the determination of a three-factor solution based on parallel analysis, the initial unrotated factor loading matrix was examined (Table 3). This matrix presents the raw loadings of each observed variable on the extracted factors before rotation, illustrating the initial variance distribution.

As shown in Table 3, all variables demonstrated substantial loadings across the first three factors. The presence of both positive and negative loadings, as well as cross-loadings (where items load significantly on more than one factor), is typical in an unrotated solution. This initial matrix confirms that the selected factors effectively capture a considerable amount of variance from the original variables, providing the foundation for subsequent rotation to enhance interpretability.

The proportion of variance in each observed variable explained by the extracted factors, known as communalities, is shown in Table 3. All communality values were notably high, ranging from 0.68 (Communication Skills) to 0.89 (Upgrade of Current Understanding). The high communality values suggest that a substantial amount of each item's variance is explained by the three extracted factors. This strong explained variance provides additional evidence for the data's suitability for factor analysis and validates that the three-factor model accurately captures the underlying constructs without sacrificing crucial information from the variables.

**Table 3****Unrotated Factor Loading Matrix**

Variable	F1	F2	F3	Communality
Understanding of Main Duties and Functions	-0.63	-0.55	0.41	0.87
Technology Skills	-0.64	-0.54	0.40	0.87
Data Management Skills	-0.62	-0.55	0.40	0.85
Understanding of School Policies	-0.65	-0.54	0.34	0.83
Communication Skills	-0.66	-0.47	0.16	0.68
Enhancement of Knowledge and Skills	-0.73	-0.29	-0.36	0.75
Desire to Improve Digital Competence	-0.75	-0.27	-0.47	0.85
Impact of Competence Development	-0.81	-0.23	-0.31	0.81
Upgrade of Current Understanding	-0.75	-0.26	-0.52	0.89
Need for Digital Competence Development	-0.77	-0.24	-0.47	0.87
Student Administration Competence	-0.65	0.50	0.13	0.70
Personnel Administration Competence	-0.73	0.48	0.10	0.77
Curriculum Administration Competence	-0.66	0.53	0.10	0.73
Financial Administration Competence	-0.63	0.55	0.07	0.70
Facilities and Infrastructure Administration	-0.72	0.50	0.13	0.79
Public Relations Administration Competence	-0.67	0.48	0.11	0.69
Correspondence Administration Competence	-0.74	0.417	0.11	0.74
Digital Archiving Competence	-0.76	0.405	0.01	0.74

**Factor Structure**

Following the determination of a three-factor solution through parallel analysis, the factor structure was further examined. The initial unrotated factor loading matrix (Table 3) provided insight into the variance distribution across factors. With all variables exhibiting strong loadings and high communality values (ranging from 0.68 to 0.89), it was evident that the three extracted factors accounted for a substantial proportion of each variable's variance.

The factors were subjected to promax rotation to achieve a more interpretable and theoretically meaningful factor structure. This decision was based on the cross-loadings observed in the unrotated matrix and is a typical practice for correlated factors. The rotated loading matrix (Table 4) presents the factor loadings, with loadings lower than an absolute 0.60 omitted to highlight salient relationships and facilitate interpretation (Table 4).

Based on Table 4, the three factors, along with their respective item loadings, explained variance, reliability, and factor determinacy index, are detailed below. The correlation among the variables yields three new factors, each given a common label representing a previously undefined variable or a general factor.

***Factor 1: Motivation for Competence Development***

Factor 1 is strongly defined by items reflecting the drive and mechanisms for improving digital skills and knowledge. Key items loading on this factor include Upgrade of Current Understanding (1.01), Desire to Improve Digital Competence (0.95), Need for Digital Competence Development (0.95), Enhancement of Knowledge and Skills (0.82), and Impact of Competence Development (0.78). This factor highlights a proactive approach towards acquiring and improving digital-related competencies and overall knowledge.

***Factor 2: Core Understanding and Foundational Skills***

Factor 2 is characterized by items related to fundamental understanding of roles and policies, the ability to operate school systems efficiently, and general technological and communication abilities. Prominent loadings include Understanding of Main Duties and Functions (0.96), Technology Skills (0.95), Data Management Skills (0.95), Understanding of School Policies (0.90), and Communication Skills (0.68). This factor represents the foundational knowledge base and essential interpersonal and digital skills necessary for daily operations.

**Table 4**

**Rotated Factor Loading Matrix**

Variable	F1	F2	F3
Understanding of Main Duties and Functions		0.96	
Technology Skills		0.95	
Data Management Skills		0.95	
Understanding of School Policies		0.90	
Communication Skills		0.68	
Enhancement of Knowledge and Skills	0.82		
Desire to Improve Digital Competence	0.95		
Impact of Competence Development	0.78		
Upgrade of Current Understanding	1.01		
Need for Digital Competence Development	0.95		
Student Administration Competence			0.86
Personnel Administration Competence			0.87
Curriculum Administration Competence			0.88
Financial Administration Competence			0.87
Facilities and Infrastructure Administration			0.89
Public Relations Administration			0.84
Competence			
Correspondence Administration Competence			0.82
Digital Archiving Competence			0.78

*Note.* Loadings lower than an absolute 0.60 are omitted.

**Factor 3: Core Functional Competencies of School Administration**

Factor 3 encompasses a broad range of specific administrative functionalities within an institutional context. Items loading highly on this factor are Facilities and Infrastructure Administration Competence (0.89), Curriculum Administration Competence (0.88), Personnel Administration Competence (0.87), Financial Administration Competence (0.87), Student Administration Competence (0.86), Public Relations Administration Competence (0.84), Correspondence Administration Competence (0.82), and Digital Archiving Competence (0.78). This factor delineates the practical and operational proficiencies required across various schools.

**DISCUSSION**

The findings of this study directly address the research objectives and questions by identifying three determinant factors for the development of school administrative staff competence: Motivation for Competence Development, Core Understanding and Foundational Skills, and Core Functional Competencies of School Administration. These factors reflect a multidimensional structure of administrative roles in schools, confirming that effective school administration requires more than just technical knowledge; it demands motivation, adaptability, and domain-specific expertise.

The first factor, Motivation for Competence Development, emerged as a critical driver for professional growth among administrative staff. The findings of this study align with prior research emphasizing the importance of internal drivers such as self-development, intellectual curiosity, and the alignment of personal and organizational goals (Balida, 2024; Hayudini, 2021; Szymd, 2024). Consistent with prior research, motivated staff are more likely to engage in continuous learning and demonstrate long-term commitment to school objectives (Sa'diyah et al., 2024; Tj, 2021). Additionally, the lack of motivation, limited in-service training, and low compensation were identified as significant barriers to staff performance (Ndaipa, 2016), underscoring the need for structured and ongoing professional development (Joyce & Showers, 2002; Pregot, 2016).

Effective capacity-building should combine core training for all staff with targeted support for those seeking advanced development, such as coaching or mentoring (Bloomfield et al., 2024; Erath et al., 2019; Hoffner et al., 2021). Tailoring training to staff needs not only improves efficiency but also enhances satisfaction and retention (Armstrong & Rayner, 2021;

Nemeh et al., 2023). Leadership practices that recognize contributions and foster growth further strengthen motivation and morale (Morris et al., 2020; Wilson Heenan et al., 2023).

The second factor, Core Understanding and Foundational Skills, highlights the foundational knowledge and abilities required for effective daily operations. This factor includes proficiency in technology, data management, policy understanding, and communication, which are critical for efficient school administration (Anisah et al., 2020; Daswin et al., 2022; Gunawan et al., 2023; Ossai et al., 2024; Sumarsono et al., 2022). The prominence of this factor is consistent with the literature emphasizing the transformative impact of digital tools on enhancing administrative efficiency (Butler & Visscher, 2014; Chandra et al., 2020). Furthermore, mastery of information technology, data analysis skills, and adaptability to new systems are core competencies essential for future administrative staff (Adhikari et al., 2024; Ajani & Dlomo, 2025; Nkambule & Ngubane, 2024).

Beyond technical proficiency, these foundational skills also encompass essential human and organizational capabilities, such as communication, teamwork, and visionary leadership, all of which are vital for fostering a supportive school environment (Akinnubi et al., 2024; Atiş & Dilbaz, 2022; Sohn & Woo, 2023; Sonsaard & Darbavasu, 2019). They also exhibit organizational skills such as time management, crisis management, and stakeholder engagement. They are adept at planning, supervising, coordinating tasks, and adapting to change (Atiş & Dilbaz, 2022; Manafa, 2020; Ossai et al., 2024; Sonsaard & Darbavasu, 2019).

Although school administration staff have made progress in using digital technologies, their abilities remain in the “sufficient” category (Sumarsono et al., 2022). Thus, there is a clear need for continued investment in targeted digital training that is both context-specific and up to date (Calinici & Drugan, 2015; Kong et al., 2024; Szymyd, 2024). The effective implementation of cloud-based school management systems can significantly improve data management, flexibility, and overall efficiency (Chandra et al., 2020). By integrating technical, human, and organizational skills, schools can cultivate administrative staff capable of meeting both current operational demands and future institutional challenges (Nafi’a et al., 2024).

The third factor reflects the core functional competencies of school administration in curriculum, student services, personnel services, finance, infrastructure, and public relations. These areas are core to the day-to-day operations of educational institutions (Hallinger et al., 2018; Nwuke, 2021; Widiyanti et al., 2024). The increasing professionalization of administrative roles in educational systems globally underscores the complexity of these responsibilities (Abdullah & Arifin, 2024; Creaby, 2021; Nemeh et al., 2023; Starr, 2021), requiring staff to possess not only technical knowledge but also the ingenuity, conceptual thinking, and organizational skills to apply it effectively in diverse contexts (Anietie & Ayonuwe, 2022; Efendi & Desmiarti, 2021; Marmoah et al., 2019).

The School Administration Manager (SAM) framework provides a structured approach for principals to delegate or streamline managerial duties, allowing them to focus on instructional leadership (Goldring et al., 2020; Sheng et al., 2017). However, successful adoption of such frameworks requires investment in personnel, training, and ongoing support, as well as addressing challenges related to time, resources, and staff buy-in (Goldring et al., 2020). Regular training and capacity building, alongside empowerment programs and performance assessments, are crucial for maintaining and enhancing these competencies (Gunawan et al., 2023; Lidianti et al., 2023; Nafi’a et al., 2024; Sabandi et al., 2018; Wibowo et al., 2024). Clear communication and well-defined roles also enhance technical competence and streamline school operations (Srimawati et al., 2025).

Collectively, these three factors demonstrate that school administrative competence is inherently multidimensional, integrating motivation, foundational knowledge, and functional expertise to support effective management and the broader goal of educational quality improvement. By comprehensively addressing all three factors (Motivation for Competence Development, Core Understanding and Foundational Skills, and Core Functional Competencies of School Administration), school leaders and policymakers can cultivate a more effective, engaged, and adaptable administrative staff. This strategic approach directly supports overall school improvement and contributes significantly to educational success by enabling principals to focus on strengthening instructional leadership rather than purely managerial and business aspects of schools.

## **IMPLICATIONS**

Our findings confirm that the role of school administrative staff is far more complex than just providing support. The three core factors of their competence (from a drive for professional growth to a command of technical and administrative skills) highlight their integral role in school effectiveness. The implication is clear: school leaders and policymakers must view administrative staff not as a secondary resource, but as a primary investment. By adopting a competency-based approach to

training and management, schools can directly enhance their operational efficiency and adaptability in an era of rapid technological and systemic change.

### **1. Differentiated Professional Learning Design**

The implications highlight the need for customized professional development that addresses the administration staff not only task-specific technical skills but also internal motivational factors. School leaders and professional development coordinators should consider designing tiered training models that support both skill-building and self-driven professional growth among administrative staff.

### **2. Leadership Support for Digital Transformation**

The prominence of digital competence-related items within the factor structure signals a critical need for leadership support in digital capacity building. School administrators are encouraged to prioritize digital upskilling initiatives, ensuring that non-teaching staff can effectively manage data, communication, and archiving tasks in increasingly technology-integrated school environments.

### **3. Strategic Human Resource Practices in Schools**

The factor structure provides a clear empirical basis for adopting competency-based approaches in recruitment, training, and performance appraisal. School leaders and HR departments should align administrative roles with the identified competence domains to clarify expectations and guide professional growth trajectories.

### **4. Policy and Resource Allocation**

The evidence highlights the need for policies that prioritize comprehensive capacity-building for school administrative staff. Such policies should not only strengthen technical expertise but also foster motivation for continuous self-improvement and adaptability. To achieve this, local and national governments are encouraged to institutionalize competency-based training through structured programs and sustained resource allocation, thereby ensuring that administrative staff are recognized and empowered as central contributors to school effectiveness.

### **5. Strengthening School Leadership Capacity**

Since administrative staff play a critical role in supporting school operations, developing their competence directly contributes to school leadership capacity and organizational effectiveness. Principals and school leaders should recognize the strategic importance of administrative staff as partners in school improvement efforts.

## **CONCLUSION**

The factor analysis identified three principal factors of school administrative staff competence: Motivation for Competence Development, Core Understanding and Foundational Skills, and Core Functional Competencies of School Administration. The first factor reflects a proactive drive to continuously enhance digital skills, knowledge, and overall professional competence. The second factor encompasses a solid understanding of core duties, school policies, technological proficiency, data management, and communication skills as the foundation for effective daily operations. The third factor captures the technical expertise required to execute key administrative functions, including curriculum, finance, personnel, facilities, student services, public relations, and digital archiving. Collectively, these dimensions demonstrate that school administrative competence is inherently multidimensional, integrating motivation, foundational knowledge, and functional expertise to support effective management and the broader goal of educational quality improvement. In doing so, this study fulfills its research objectives by clarifying the determinant factors of competence, categorizing them into motivational, cognitive, technical, and functional domains, and outlining practical implications for professional development and policy.

## **ACKNOWLEDGMENTS**

The authors would like to express their gratitude and appreciation to the Ministry of Higher Education, Science, and Technology of the Republic of Indonesia and Universitas Negeri Malang for their support. Special thanks are also extended

to the Indonesian Education Scholarship (BPI) 2023 and the Indonesia Endowment Fund for Education (LPDP) for providing the funding and opportunity to pursue this doctoral study.

## REFERENCES

- Abdullah, M. R., & Arifin, I. (2024). School administrative staff: Duties and responsibilities in modern education. In *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia*, 329–337. <https://conference.um.ac.id/index.php/pses/article/view/9539>
- Adhikari, N. P., Budhathoki, J. K., & Adhikari, S. (2024). Management information systems' role and effects on school administration: A review. *Perspectives on Higher Education*, 14(1), 81–94. <https://doi.org/10.3126/phe.v14i1.76569>
- Ajani, O. A., & Dlomo, S. (2025). Enhancing school administration in rural South African schools: Challenges and opportunities-using the scooping review method. *Research in Social Sciences and Technology*, 10(1), 332–354. <https://doi.org/10.46303/ressat.2025.18>
- Akinnubi, O., Owonwami, O. A., & Salman, S. N. (2024). Principals' administrative skills in public senior secondary schools: A case of Ilorin, Nigeria. *Journal of Educational Management and Instruction (JEMIN)*, 3(2), 126–134. <https://doi.org/10.22515/jemin.v3i2.8501>
- Alavi, M., Visentin, D. C., Thapa, D. K., Hunt, G. E., Watson, R., & Cleary, M. (2020). Exploratory factor analysis and principal component analysis in clinical studies: Which one should you use? *Journal of Advanced Nursing*, 76(8), 1886–1889. <https://doi.org/10.1111/jan.14377>
- Alvarez-Cedillo, J., Aguilar-Fernandez, M., Sandoval-Gomez, R. J., & Alvarez-Sanchez, T. (2019). Actions to be taken in Mexico towards education 4.0 and society 5.0. *International Journal of Evaluation and Research in Education (IJERE)*, 8(4), 693. <https://doi.org/10.11591/ijere.v8i4.20278>
- Alvaro, R. R., & Triwiyanto, T. (2024). The role of administrative staff in improving the quality of service in schools. *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia*, 243–251. <https://conference.um.ac.id/index.php/pses/article/view/9553>
- Anietie, R., & Ayonuwe, G. P. (2022). School business management competencies for improved administrative effectiveness in public secondary schools in Rivers State, Nigeria. *Paedagogia: Jurnal Pendidikan*, 11(1). <https://doi.org/10.24239/pdg.vol11.iss1.254>
- Anisah, A., Rusdinal, R., Sabandi, A., & Ningrum, T. A. (2020). Analysis of school administrative technique competency in vocational school. In A. H. Pamungkas, Jamaris, & Solfema (Eds.), *Digital press social sciences and humanities: Proceeding of the non-formal education international conference 2020* (Vol. 6). UGM Digital Press. <https://doi.org/10.29037/digitalpress.46389>
- Anselmus Dami, Z., Budi Wiyono, B., Imron, A., Burhanuddin, B., Supriyanto, A., & Daliman, M. (2022). Principal self-efficacy for instructional leadership in the perspective of principal strengthening training: Work engagement, job satisfaction and motivation to leave. *Cogent Education*, 9(1). <https://doi.org/10.1080/2331186X.2022.2064407>
- Armstrong, P. W., & Rayner, S. (2021). School business leadership: Current issues and future prospects. *Management in Education*, 35(2), 81–82. <https://doi.org/10.1177/0892020620981947>
- Atiş, D., & Dilbaz, E. (2022). The evaluation of management skills of school administrators in the context of effective school. *Anadolu Journal of Educational Sciences International*, 12(2), 442–467. <https://doi.org/10.18039/ajesi.910568>
- Balida, D. A. (2024). Intrinsic motivation and the future of professional development across genders, qualifications, and experience. *International Journal of Educational Contemporary Explorations*, 1(1), 1–11. <https://doi.org/10.69481/IJECE0522>
- Bayat, A., & Fataar, A. (2020). Exploring agency in marginalised occupations: School administrative clerks' deployment of 'participatory capital' in establishing practice-based agency. *Perspectives in Education*, 38(1), 255–268. <https://doi.org/10.18820/2519593X/pie.v38i1.18>
- Biçer, D. (2014). The effect of students' and instructors' learning styles on achievement of foreign language preparatory school students. *Procedia - Social and Behavioral Sciences*, 141, 382–386. <https://doi.org/10.1016/j.sbspro.2014.05.067>
- Bloomfield, B. S., Fox, R. A., & Leif, E. S. (2024). Multi-tiered systems of educator professional development: A systematic literature review of responsive, tiered professional development models. *Journal of Positive Behavior Interventions*, 26(3), 168–188. <https://doi.org/10.1177/10983007231224028>

- Butler, R., & Visscher, A. (2014). The hopes and realities of the computer as a school administration and school management tool. In K. Rannenbergh (Ed.), *IFIP advances in information and communication technology* (Vol. 424, pp. 197–202). Springer Nature. [https://doi.org/10.1007/978-3-642-55119-2\\_13](https://doi.org/10.1007/978-3-642-55119-2_13)
- Calinici, T., & Drugan, T. (2015). Using e-learning for developing new skills for administrative staff. *MedEdPublish*, 6(5), 1–5. <https://doi.org/10.15694/mep.2015.006.0005>
- Chandra, Y., Willis, R., Windoro, C., & Sfenrianto, S. (2020). Business process design for Widuri Indah School management system with the support of cloud computing. *Advances in Science, Technology and Engineering Systems Journal*, 5(3), 536–539. <https://doi.org/10.25046/aj050366>
- Comrey, A. L., & Lee, H. B. (2013). *A first course in factor analysis* (2nd ed). Psychology Press. <https://doi.org/10.4324/9781315827506>
- Costello, A. B., & Osborne, J. W. (2005). Best practices in exploratory factor analysis: Four recommendations for getting the most from your analysis. *Practical Assessment, Research and Evaluation*, 10(7), 1–9. <https://doi.org/10.7275/jyj1-4868>
- Cramer, D., & Howitt, D. (2004). Communalities, in factor analysis. In D. Cramer & D. Howitt (Eds.), *The SAGE dictionary of statistics* (p. 30). SAGE Publications, Ltd. <https://doi.org/10.4135/9780857020123.n91>
- Creaby, F. (2021). Positioning school business practitioners in the English school system. *Management in Education*, 35(2), 83–93. <https://doi.org/10.1177/0892020621994301>
- Darmaji, D., Mustiningsih, M., & Arifin, I. (2019). Quality management education in the industrial revolution era 4.0 and society 5.0. In A. V. Valdes, James Ong Chye Hin, F. L. Ben, & Tsukasa Hirashima et al. (Eds.), *Proceedings of the 5th international conference on education and technology (ICET 2019)* (pp. 565–570). Atlantis Press. <https://doi.org/10.2991/icet-19.2019.141>
- Daswin, A., Mahdum, M., & Hadriana, H. (2022). The influence of digital literacy and digital workplace on e-leadership of educators and education staff of a state vocational school. *International Journal of Educational Best Practices*, 6(2), 160–173. <https://doi.org/10.31258/ijebp.v6n2.p160-173>
- DeVellis, R. F. (2017). *Scale development: Theory and applications* (4th ed). SAGE.
- Efendi, S., & Desmiarti. (2021). The effect of compensation, training and motivation on employee performance at the school of business and management, bandung institute of technology. *INFLUENCE : International Journal of Science Review*, 3(1), 74–86. <https://doi.org/10.54783/influence.v3i1.127>
- Erath, T., Reed, F. D., Sundermeyer, H., Brand, D., Novak, M., Harbison, M., & Shears, R. (2019). Enhancing the training integrity of human service staff using pyramidal behavioral skills training. *Journal of Applied Behavior Analysis*, 53(1), 449–464. <https://doi.org/10.1002/jaba.608>
- Fabrigar, L. R., Wegener, D. T., MacCallum, R. C., & Strahan, E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272–299. <https://doi.org/10.1037/1082-989X.4.3.272>
- Farradiba, N. A., Burhanuddin, & Triwiyanto, T. (2024). The importance of analyzing the needs of school administration personnel in managing human resources. *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia, September*, 343–352. <https://conference.um.ac.id/index.php/pses/article/view/9541>
- Ferrando, P., & Lorenzo-Seva, U. (2017). Program FACTOR at 10: Origins, development and future directions. *Psicothema*, 29(2), 236–240. <https://doi.org/10.7334/psicothema2016.304>
- Field, A. (2024). *Discovering statistics using IBM SPSS statistics* (6th ed). SAGE Publications.
- Fischer, J. H. (2016). The administrator and the school staff. In F. C. Gruber (Ed.), *Teaching in America* (pp. 160–168). University of Pennsylvania Press. <https://doi.org/10.9783/9781512802115-020>
- Goldring, E., Grissom, J., Neumerski, C. M., Blissett, R., Murphy, J., & Porter, A. (2020). Increasing principals’ time on instructional leadership: exploring the SAM® process. *Journal of Educational Administration*, 58(1), 19–37. <https://doi.org/10.1108/JEA-07-2018-0131>
- Goretzko, D., Pham, T. T. H., & Bühner, M. (2021). Exploratory factor analysis: Current use, methodological developments and recommendations for good practice. *Current Psychology*, 40(7), 3510–3521. <https://doi.org/10.1007/s12144-019-00300-2>
- Gunawan, R. N., Mastur, S. N., & Wibowo, U. B. (2023). The involvement of school administrative staff in harnessing information technology: A systematic literature review. *Tarbawi: Jurnal Keilmuan Manajemen Pendidikan*, 9(02), 245–256. <https://doi.org/10.32678/tarbawi.v9i02.9124>
- Hair, J. F., Black, W. C., Babin, B. J., & Anderson, R. E. (2013). *Multivariate data analysis* (7th ed.). Pearson Education Limited.

- Hallinger, P., Hosseingholizadeh, R., Hashemi, N., & Kouhsari, M. (2018). Do beliefs make a difference? Exploring how principal self-efficacy and instructional leadership impact teacher efficacy and commitment in Iran. *Educational Management Administration and Leadership*, 46(5). <https://doi.org/10.1177/1741143217700283>
- Hayudini, M. A. (2021). Technical trainings and professional development: The means of organizational growth. *Instabright International Journal of Multidisciplinary Research*, 3(2), 55–59. <https://doi.org/10.52877/instabright.003.02.0062>
- Hoffner, C., Worsham, D., Myers, B., Osuna-Garcia, A., Bowline, E., & Pham, K. (2021). Reference revamp: A 1-2 model for training and tiered services. *Medical Reference Services Quarterly*, 40(2), 188–204. <https://doi.org/10.1080/02763869.2021.1912573>
- Hogarty, K. Y., Hines, C. V., Kromrey, J. D., Ferron, J. M., & Mumford, K. R. (2005). The quality of factor solutions in exploratory factor analysis: The influence of sample size, communalities, and overdetermination. *Educational and Psychological Measurement*, 65(2), 202–226. <https://doi.org/10.1177/0013164404267287>
- Horn, J. L. (1965). A rationale and test for the number of factors in factor analysis. *Psychometrika*, 30(2), 179–185. <https://doi.org/10.1007/BF02289447>
- Icela, G.-P. L., Soledad, R.-M. M., & Antonio, E.-G. J. (2023). Education 4.0 maturity models for society 5.0: Systematic literature review. *Cogent Business & Management*, 10(3), 1–27. <https://doi.org/10.1080/23311975.2023.2256095>
- Jeno, L. M., Nylehn, J., Hole, T. N., Raaheim, A., Velle, G., & Vandvik, V. (2023). Motivational determinants of students' academic functioning: The role of autonomy-support, autonomous motivation, and perceived competence. *Scandinavian Journal of Educational Research*, 67(2), 194–211. <https://doi.org/10.1080/00313831.2021.1990125>
- Joyce, B. R., & Showers, B. (2002). *Student achievement through staff development*. (3rd ed.). Association for Supervision and Curriculum Development.
- Khosrow-Pour, M. (Ed.). (2021). *Handbook of research on modern educational technologies, applications, and management*. IGI Global. <https://doi.org/10.4018/978-1-7998-3476-2>
- Kong, S. C., Mak, Z. W. S., Wu, Y., & Yang, Y. (2024). Evaluating the effectiveness of a professional development course on artificial intelligence literacy for administrative staff in higher education. In A. Kashihara, M. M. Rodrigo, & W. et al. Chen (Eds.), *The 32nd international conference on computers in education (ICCE)*. Asia-Pacific Society for Computers in Education. <https://doi.org/10.58459/icce.2024.4985>
- Kowalski, T. J. (2012). *Case studies on educational administration* (6th ed.). Pearson.
- Lidyanti, N., Kartiwi, A. P., & Somantri, M. (2023). Supervision of school administrative staff competence to improve school administration quality in public high schools. *International Journal of Educational Management and Innovation*, 4(2), 127–138. <https://doi.org/10.12928/ijemi.v4i2.8069>
- Lorenzo-Seva, U. (2021). Solomon: A method for splitting a sample into equivalent subsamples in factor analysis. *Behavior Research Methods*, 54(6), 2665–2677. <https://doi.org/10.3758/s13428-021-01750-y>
- Lorenzo-Seva, U., & Ferrando, P. J. (2019). Robust Promin: A method for diagonally weighted factor rotation. *Liberabit: Revista Peruana de Psicología*, 25(1), 99–106. <https://doi.org/10.24265/liberabit.2019.v25n1.08>
- Lorenzo-Seva, U., & Ferrando, P. J. (2021). MSA: The forgotten index for identifying inappropriate items before computing exploratory item factor analysis. *Methodology*, 17(4), 296–306. <https://doi.org/10.5964/meth.7185>
- Lumungga, M. I., & Bafadal, I. (2024). Effective management of school administrative personnel in an effort to improve services. *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia*, 292–297. <https://conference.um.ac.id/index.php/pses/article/view/9534>
- Manafa, N. F. (2020). Principals' managerial skills and administrative effectiveness in public secondary schools in Anambra State, Nigeria. *International Journal of Innovative Psychology & Social Development*, 8(4), 44–53.
- Marmoah, S., Adela, D., & Fauziah, M. (2019). Implementation of facilities and infrastructure management in public elementary schools. *Al-Tanzim : Jurnal Manajemen Pendidikan Islam*, 3(1), 102–134. <https://doi.org/10.33650/al-tanzim.v3i1.507>
- Morris, J. E., Lummis, G. W., Lock, G., Ferguson, C., Hill, S., & Nykiel, A. (2020). The role of leadership in establishing a positive staff culture in a secondary school. *Educational Management Administration & Leadership*, 48(5), 802–820. <https://doi.org/10.1177/1741143219864937>
- Mundfrom, D. J., Shaw, D. G., & Ke, T. L. (2005). Minimum sample size recommendations for conducting factor analyses. *International Journal of Testing*, 5(2), 159–168. [https://doi.org/10.1207/s15327574ijt0502\\_4](https://doi.org/10.1207/s15327574ijt0502_4)
- Nafi'a, D. R., Imron, A., & Mustiningsih. (2024). Challenges and opportunities for school administrative staff in the future. *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia*, September, 106–111. <https://conference.um.ac.id/index.php/pses/article/view/9498>

- Ndaipa, C. J. (2016). Leadership styles adopted by headteachers and the influence on staff performance in primary schools in Mozambique. In W. Wu, S. Alan, & M. T. Hebebe (Eds.), *The Eurasia proceedings of educational & social sciences (EPESS)* (Vol. 5, pp. 107–115). SRES Publishing.
- Nemeh, A., Hasan, R., & Hazir, Ö. (2023). Business school students' motivations and intentions to pursue a project management career. *British Journal of Guidance & Counselling*, 51(6), 963–975. <https://doi.org/10.1080/03069885.2022.2106550>
- Nkambule, B. I., & Ngubane, S. A. (2024). Perceived barriers to optimal effectiveness of the South African school administration and management system (SA-SAMS). *International Journal of Research in Business and Social Science* (2147-4478), 13(2), 364–374. <https://doi.org/10.20525/ijrbs.v13i2.3234>
- Nkansah, B. K. (2018). On the kaiser-meier-olkin's measure of sampling adequacy. *Mathematical Theory and Modeling*, 8(7), 52–76.
- Nwuke, J. (2021). Educational resources in educational management for quality school administration. *Quest Journals: Journal of Research in Humanities and Social Science*, 9(7), 57–63.
- Ossai, D. A. G., Oduma, D. J. O., & Osegi, D. M. N. (2024). Essential administrative skills for school resources efficient management. *Educational Administration: Theory and Practice*, 30(11), 959–969. <https://doi.org/10.53555/kuey.v30i11.8647>
- Polat, L., & Erkollar, A. (2021). Industry 4.0 vs. society 5.0. In N. M. Durakbasa & M. G. Gençyılmaz (Eds.), *Digital conversion on the way to industry 4.0. ISPR 2020. Lecture notes in mechanical engineering* (pp. 333–345). Springer. [https://doi.org/10.1007/978-3-030-62784-3\\_28](https://doi.org/10.1007/978-3-030-62784-3_28)
- Pregot, M. (2016). *Successful school staffing strategies: Staff development with a focus on student learning*. Rowman & Littlefield.
- Rodriguez, D. D., Menchaca, V. D., & Padilla, G. (2021). Social Justice: School administrative staff perceptions of strengths, challenges, and training needs in section 504-only services. *Journal of Leadership, Accountability and Ethics*, 18(1). <https://doi.org/10.33423/jlae.v18i1.4006>
- Rogers, P. (2022). Best practices for your exploratory factor analysis: A factor tutorial. *Revista de Administração Contemporânea*, 26(6), 1–17. <https://doi.org/10.1590/1982-7849rac2022210085.en>
- Sa'diyah, I., Ulfatin, N., & Nurabadi, A. (2024). Effective school strategies in developing the competence of school administrative staff to achieve educational vision. In A. J. Setyowati & et al. (Eds.), *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia* (pp. 223–230). <https://conference.um.ac.id/index.php/pses/article/view/9525>
- Sabandi, A., Anisah, A., & Rusdinal, R. (2018). Training needs analysis: Study on development of school administration's competence. *Journal of Educational Review and Research*, 1(1), 15–24. <https://doi.org/10.26737/jerr.v1i1.505>
- Salimova, T., Vukovic, N., & Guskova, N. (2020). Towards sustainability through industry 4.0 and society 5.0. *International Review*, 3–4, 48–54. <https://doi.org/10.5937/intrev20030485>
- Sheng, Z., Wolff, L., Kilmer, L., & Yager, S. (2017). School administration manager: Redefining the principal's role as an instructional leader. *Journal of School Leadership*, 27(1), 119–142. <https://doi.org/10.1177/105268461702700105>
- Sohn, Y., & Woo, M. (2023). Understanding the experience of administrative staffs from the school context perspective. *The Journal of Local Education Management*, 26(2), 49–78. <https://doi.org/10.23196/tjlem.2023.26.2.049>
- Sonsaard, S., & Darbavasu, S. (2019). Administrative skills of modern school administrators. *Business Sustainability and Innovation*, 65(1), 522–529. <https://doi.org/10.15405/epsbs.2019.08.52>
- Srimawati, I., Setyaningsih, R., Irawati, I., & Paiman, P. (2025). Leadership strategies of administrative heads in shaping a conducive work climate: A case study of SMAN 12 Pekanbaru. *Journal of Asian Islamic Educational Management (JAIEM)*, 3(1), 1–8. <https://doi.org/10.53889/jaiem.v3i1.623>
- Starr, K. (2021). What future for school business leadership? Recent change and looming possibilities. *Management in Education*, 35(2), 108–116. <https://doi.org/10.1177/0892020620969855>
- Sumarsono, R. B., Prestiadi, D., Kusumaningrum, D. E., Zulkarnain, W., Ubaidilah, E., Bhayangkara, A. N., & Indrawanto, D. W. (2022). Analysis of capability level school administration staff in management archives based on digital technology. *2022 2nd International Conference on Information Technology and Education (ICIT&E)*, 311–315. <https://doi.org/10.1109/ICITE54466.2022.9759553>
- Suryana, A., Karim, A. A., & Sapriya, S. (2018). Capacity building management for school administrative staff at UPI laboratory school (Manajemen capacity building tenaga administrasi sekolah di sekolah laboratorium UPI). *Pedagogia*, 15(3), 250–265. <https://doi.org/10.17509/pdgia.v15i3.11021>

- Szmyd, K. (2024). The role of training in motivating employees in public administration. *Scientific Papers of Silesian University of Technology: Organization and Management Series*, 24(194), 505–521. <https://doi.org/10.29119/1641-3466.2024.194.30>
- Tabachnick, B. G., Fidell, L. S., & Ullman, J. B. (2019). *Using multivariate statistics* (7th ed). Pearson Education.
- Tj, H. W. (2021). The influence of organization culture and commitment mediated by motivation to career development of school administrative staff in the south Tangerang Regional. *International Journal of Science, Technology & Management*, 2(3), 668–672. <https://doi.org/10.46729/ijstm.v2i3.204>
- Umnia, J., Wiyono, B. B., & Timan, A. (2024). The role of school administrative staff in the quality of school services. *Proceedings of the international seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia, September*, 437–442. <https://conference.um.ac.id/index.php/pses/article/view/9528>
- Vizeshfar, F., & Torabizadeh, C. (2018). The effect of teaching based on dominant learning style on nursing students' academic achievement. *Nurse Education in Practice*, 28, 103–108. <https://doi.org/10.1016/j.nepr.2017.10.013>
- Watkins, M. W. (2018). Exploratory factor analysis: A guide to best practice. *Journal of Black Psychology*, 44(3), 219–246. <https://doi.org/10.1177/0095798418771807>
- Waziana, W., Andewi, W., & Suningsih, S. (2022). Analysis of the role of education personnel in school administration. *JLCEdu (Journal of Learning and Character Education)*, 2(2), 43–54. <https://doi.org/10.56327/jlcedu.v2i2.41>
- Wibowo, A. H., Timan, A., & Sobri, A. Y. (2024). Capacity development strategy for school administrative staff to support improving the quality of education. *Proceedings of the International Seminar Universitas Negeri Malang Indonesia – Universiti Malaya Malaysia*, 16–22. <https://conference.um.ac.id/index.php/pses/article/view/9450>
- Widiyanti, A., Supriyanto, A., & Kusumaningrum, D. E. (2024). Implementation of the principal's leadership role in improving the effectiveness of school administrative staff performance. *Proceedings series of educational studies: Seminar nasional manajemen pendidikan*, 1–5. <https://conference.um.ac.id/index.php/pses/article/view/10158/3953>
- Wilson Heenan, I., De Paor, D., Lafferty, N., & Mannix McNamara, P. (2023). The impact of transformational school leadership on school staff and school culture in primary schools—A systematic review of international literature. *Societies*, 13(6), 133. <https://doi.org/10.3390/soc13060133>
- Winarno, A., Agustina, Y., & Vinola, R. (2020). Developing website-based school financial administrative management system during covid-19 pandemic. *International Journal of Business, Economics and Law*, 22(1), 167–172.
- Wiyono, B. B., Indreswari, H., & Prastiawan, A. (2021). The use of communication technology in establishing community relationships applied by school administration staff, in relation to their education level and age. *2021 3rd International Conference on Computer Communication and the Internet (ICCCI)*, 214–219. <https://doi.org/10.1109/ICCCI51764.2021.9486784>
- Woods, C. (2014). Anatomy of a professionalization project: The making of the modern school business manager. In *Anatomy of a professionalization project: The making of the modern school business manager*. Bloomsbury Academic. <https://doi.org/10.5040/9781472593276.0009>
- Yalçinkaya, S., Dağlı, G., Altınay, F., Altınay, Z., & Kalkan, Ü. (2021). The effect of leadership styles and initiative behaviors of school principals on teacher motivation. *Sustainability*, 13(5), 2711. <https://doi.org/10.3390/su13052711>
- Yong, A. G., & Pearce, S. (2013). A beginner's guide to factor analysis: Focusing on exploratory factor analysis. *Tutorials in Quantitative Methods for Psychology*, 9(2), 79–94. <https://doi.org/10.20982/tqmp.09.2.p079>
- Yulianti, H. (2021). Performance of educational personnel in school data management in Madrasah Tsanawiyah. *Journal of Advanced Islamic Educational Management*, 1(2), 57–66. <https://doi.org/10.24042/jaiem.v1i2.11511>
- 

**ANDI WAHED** is a doctoral candidate in Educational Management at the Faculty of Education, Universitas Negeri Malang, Indonesia. His research interests focus on school administration, educational leadership, and staff competence development. Email: [andi.wahed.2201329@students.um.ac.id](mailto:andi.wahed.2201329@students.um.ac.id)

**BAMBANG BUDI WIYONO**, EdD, M.Pd., is a professor and Chair of the Doctoral Program of Educational Management at the Faculty of Education, Universitas Negeri Malang, Indonesia. He holds an Ed.D. in Educational Research and Evaluation. His major research interests include educational quality management, educational leadership, and educational human resource management. Organizational behavior in educational institutions and teacher & lecturer competence development Email: [bambang.budi.fip@um.ac.id](mailto:bambang.budi.fip@um.ac.id)

---

**ALI IMRON**, EdD, M.Pd., is a professor in the Department of Educational Management at the Faculty of Education, Universitas Negeri Malang, Indonesia. He earned his Ed.D. in Educational Management. His research focuses on school-based student management, school/madrasah management, educational supervision, educational policy & planning, and quality management & school program evaluation. Email: [ali.imron.fip@um.ac.id](mailto:ali.imron.fip@um.ac.id)

**AHMAD YUSUF SOBRI**, EdD, M.Pd., is an associate professor and the Dean of the Faculty of Education at Universitas Negeri Malang, Indonesia. He completed his Ed.D. in Educational Management. His primary research interests cover school/madrasah principal leadership, school-based management (SBM), school organizational culture, and change management in educational institutions. Email: [ahmad.yusuf.fip@um.ac.id](mailto:ahmad.yusuf.fip@um.ac.id)

*Manuscript submitted: **December 13, 2023***

*Manuscript revised: **August 14, 2025***

*Accepted for publication: **September 4, 2025***