

Integrative Leadership Model of Vocational High School Principals in Indonesia: A Framework for Sustainable Education Quality Improvement

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ABSTRACT

This study examines the integrative leadership practices of Vocational High School (SMK) principals in Indonesia and their relationship to sustainable educational quality improvement. Employing a quantitative survey design, data were collected from 245 respondents comprising SMK principals (n = 82), teachers (n = 118), and industry stakeholders (n = 45) using a validated five-point Likert-scale instrument. Four leadership dimensions were examined: transformational, instructional, distributed, and adaptive leadership. Data were analyzed using descriptive statistics, Pearson correlation, multiple linear regression, and one-way ANOVA. Results indicate that all four dimensions significantly and positively predict Educational Quality Outcomes (EQO), collectively accounting for 49.1% of outcome variance ($R^2 = .491$; $F(4, 240) = 57.847$, $p < .001$). Transformational leadership emerged as the strongest predictor ($\beta = .413$), followed by adaptive ($\beta = .332$), instructional ($\beta = .280$), and distributed leadership ($\beta = .260$). Significant perceptual differences were found across stakeholder groups ($F(2, 242) = 3.422$, $p < .05$). These findings validate the Integrative Leadership Framework as a theoretically grounded and practically actionable model for SMK principal development in Indonesia.

Keywords: Educational Quality, Integrative Leadership, SMK Principal, Vocational High.

INTRODUCTION

The relationship between school leadership and the quality of education has emerged as one of the most researched domains in educational research. Across global education systems, leadership is consistently identified as the second-tier factor after classroom instruction most significantly related to student achievement, institutional effectiveness, and long-term organizational sustainability (Huiping Li, 2024). Integrative leadership, as conceptualized in this growing field of study, represents a multidimensional construct that synthesizes transformational, instructional, distributed, and adaptive leadership paradigms into a coherent operational framework (Rosita et al., 2022). Unlike unidimensional leadership models that prioritize a single behavioral repertoire, integrative leadership recognizes the fundamental complexity of contemporary educational institutions, where principals must simultaneously navigate pedagogical innovation, stakeholder accountability demands, regulatory compliance imperatives, and community development responsibilities (Wang et al., 2025).

In the context of Vocational and Technical Education and Training (VTET), this relationship to leadership quality becomes even more crucial given the sector's direct interaction with labor market dynamics, industrial transformation needs, and national human capital development agendas (Aryawan, 2019). The ASEAN region, characterized by profound socioeconomic heterogeneity yet bound by a shared commitment to the ASEAN Blueprint 2025 and the United Nations Sustainable Development Goals (SDGs), presents a uniquely complex terrain for examining educational leadership. Member countries collectively enroll

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approximately 95 million vocational education students, yet exhibit significant differences in institutional quality, resource allocation, teacher qualification standards, and leadership development infrastructure (Kim et al., 2024). These differences underscore the urgent need for a comprehensive and regionally contextualized leadership framework that transcends national specificities while remaining sensitive to local pedagogical cultures and socioeconomic realities (Anggung et al., 2021).

Vocational high school (SMK) principals play a crucial role in the Indonesian education system as they serve as a link between micro-level instructional practices and macro-level education policy directives (Wanto et al., 2025). Ultimately, this role determines the quality of graduates. In recent years, national regulations governing vocational high school (SMK) principals have changed significantly. The National Standards for SMK/MAK were established in 2018 by (PP Nomor 34, 2018). The regulation calls for improving the qualifications of educators and education personnel, aligning the curriculum with industry competency needs, and strengthening school-industry partnerships as key pillars of vocational education quality (Ministry of Education and Culture, 2018). The SMK Revitalization Agenda reinforces the foundation of this law. This agenda emphasizes the strategic role of principals in helping vocational high school graduates align themselves with the demands of the workplace (business and industry/DUDI) (Disas Eka Prihatin, 2018)

Recently, the Ministry of Primary and Secondary Education (Kemendikdasmen) launched the School Leadership Program in June 2025. This program is based on at least nine national laws, including Permendikdasmen Number 7 of 2025 concerning the Assignment of Teachers as Principals (Menteri Pendidikan Dasar dan Menengah, 2025). This program explicitly positions principals as learning leaders whose abilities are fundamental to ensuring the delivery of quality education amidst the demands of Industry 5.0. Data shows that Indonesia currently has a shortage of 50,971 principals, with 10,899 projected to retire by 2025, leaving more than 40,000 positions vacant. The Center of Excellence Vocational School Program emphasizes principal leadership as a key pillar of development, along with industry alignment and graduate employability (McGrath et al., 2023).

Despite supportive regulations, vocational high school leaders in Indonesia still face greater institutional burdens than a single leadership model can address. Director responsibilities have expanded beyond academic governance to include facilitating workforce development, leading digital transformation, developing industry partnerships, and adapting vocational curricula to rapidly changing labor market requirements (Armiyanti et al., 2023). According to research on leadership management in vocational high schools in Indonesia, leaders are expected to simultaneously perform multiple tasks, such as teaching, organizing, administering, and supervising, while integrating various organizational aspects, such as student service management, financial management, and infrastructure management (Megayanti et al., 2023). The accelerating pace of technological disruption exacerbates this challenge. Principals must demonstrate adaptability by integrating digital tools into instructional leadership, sustaining the implementation of curriculum reforms, maintaining teacher engagement, and ensuring professional development amidst systemic constraints in the context of Industry 5.0 and post-COVID-19 educational recovery. Traditional leadership frameworks based on a single paradigm are becoming inadequate due to these increasing demands (Sukmawati et al., 2020). An integrative model is needed that combines diverse leadership orientations into a practically applicable framework.

A growing body of empirical literature has investigated various aspects of principal leadership and its relationship to educational outcomes. (Maya Inayati Sari, 2022)wrote in *Leadership and Policy in Schools* that combining practices from various leadership models rather than using a single paradigm can more accurately predict teacher effectiveness profiles. This profile includes factors such as burnout and inactivity, as well as full professional

engagement. According to a meta-analytic review conducted by (Taqiyah et al., 2022) teacher attitudes, including academic optimism, self-efficacy, and commitment, are positively influenced by instructional leadership. This contrasts with the fact that most previous meta-analyses have concentrated on single teacher attitudes or combined various leadership models without fully integrating them.

Various studies in Indonesia have shown that transformational leadership has a significant impact on teacher performance and professional learning communities (Suharno et al., 2025), and that innovative leadership has a positive effect on teacher work behavior and organizational commitment (Ying Li et al., 2025). Specifically, research on vocational high school leadership shows that principals who effectively manage the demands of multiple aspects of vocational education improve graduate outcomes and institutional performance when they link teaching quality with industry engagement and community accountability (Ismiyanto et al., 2024). Overall, this research confirms that the multidimensional leadership construct for the vocational high school context is not only theoretically feasible but also practically necessary.

Research on leadership in general education settings is increasing, but there is still little scholarly research addressing the leadership of senior high school (SMK) principals in Indonesia and ASEAN as a whole. Current studies may be nationally limited, focus on a single institutional case, or employ Western leadership paradigms that fail to consider governance values associated with Confucianism, collectivism, or Islam in much of Southeast Asia. Research in developing countries is particularly challenging. There, curriculum reform is challenging due to systemic demands and the growing need for teachers. Principals also struggle to implement continuous quality improvement due to a lack of resources and professional development infrastructure.

This study addresses the identified gap by constructing and validating an Integrative Leadership Model specifically calibrated for high school/vocational school principals operating within the Indonesian education context. This research is guided by three main objectives: (1) to synthesize empirical evidence on the dimensions of leadership that are most predictive of sustainable quality improvement in Indonesian vocational education institutions; (2) to identify contextual mediating variables including regulatory, cultural, and industry partnership factors that moderate the leadership-quality outcome relationship; and (3) to propose an integrative leadership framework that is theory-based and practically actionable with direct application in the development programs for high school/vocational school principals in Indonesia and, more broadly, in comparable ASEAN member countries.

METHODS

Research Design

This study uses a quantitative survey design to empirically examine the integrative leadership practices of high school/vocational school principals in Indonesia and their relationship with the improvement of sustainable education quality. By using a cross-sectoral survey approach, data can be collected simultaneously from various participant groups located in different institutional environments. This construction aligns with established methodological standards in educational leadership research, which aims to evaluate leadership constructs, identify relational patterns, and produce results that can be generalized and applied to policies and practices (Slater et al., 2025)

Population and Sample

The target population of this study comprised three groups of stakeholders within vocational high schools (SMK) institutions across Indonesia: (1) vocational high school principals, serving as the primary unit of analysis; (2) teachers, as direct recipients of principal

leadership practices; and (3) industry stakeholders, including representatives from business and industry partners involved in formal school-industry collaboration programs.

To ensure adequate representation of respondent groups and institutional attributes, a purposive sampling method was used along with proportional stratification. Overall, the sample consisted of 100 to 300 respondents, proportionally distributed across three stakeholder groups. In educational survey research, a minimum threshold for inferential statistical analysis is recommended; at least thirty respondents per construct or subgroup is considered sufficient for parametric testing (Alwi Idrus, 2015) The inclusion criteria for respondents are as follows: vocational school principals with a minimum active tenure of two years; teachers with a minimum teaching period of one year under the current principal's leadership; and industry stakeholders who have an official memorandum of understanding (MoU) with the relevant vocational school institution.

Data Collection Procedure

Data were collected over a period of approximately four to five weeks. To accommodate respondents across South Sulawesi province, questionnaires were distributed through a combination of online methods, including Google Forms. Formal research permission was obtained from relevant institutional authorities prior to distribution. A written consent statement was provided to each participant, affirming voluntary participation, data confidentiality, and the use of responses solely for academic research. The questionnaires were then screened for incomplete responses, careless filling patterns (such as straight-line filling), and outliers. After data cleaning, the final usable data set was retained for statistical analysis.

RESULTS AND DISCUSSIONS

Respondent Profile

This study gathered 245 respondents from three stakeholder groups: vocational school principals ($n = 82$; 33.5%), teachers ($n = 118$; 48.2%), and industry stakeholders ($n = 45$; 18.4%). This distribution demonstrates proportional representation of the three main constituents directly involved in the governance of vocational education quality, ensuring that leadership perspectives are captured from various institutional perspectives.

Instrument Reliability

Prior to substantive analysis, Cronbach's alpha coefficient was used to measure the reliability of the instrument. All subscales demonstrated strong internal consistency, as shown in Table 1. The alpha values, which ranged from 0.862 to 0.906, all exceeded the accepted threshold of $\alpha \geq 0.70$ (Nunnally & Bernstein, 1994).

Table 1. Instrument Reliability Coefficients

Dimension	Number of Items	Cronbach's α	Interpretation
Transformational Leadership (TL)	8	.891	Excellent
Instructional Leadership (IL)	8	.874	Good
Distributed Leadership (DL)	7	.862	Good
Adaptive Leadership (AL)	8	.883	Good
Educational Quality Outcome (EQO)	9	.906	Excellent

Descriptive Statistics

Descriptive statistics for all study variables are shown in Table 2. Respondents gave positive assessments to the four dimensions of leadership, with mean scores ranging from $M = 3.61$ to $M = 3.86$ on a five-point scale, indicating moderate to high levels of integrative leadership practices across vocational high schools. Transformational leadership had the highest mean ($M = 3.86$, $SD = 0.56$), followed by Adaptive Leadership ($M = 3.78$, $SD = 0.56$),

Instructional Leadership ($M = 3.75$, $SD = 0.57$), and Distributive Leadership ($M = 3.61$, $SD = 0.62$). The Quality of Education outcome showed the highest overall mean score ($M = 3.95$, $SD = 0.48$), indicating a generally positive acceptance of institutional quality among respondents.

Table 2. Descriptive Statistics of Research Variables (N=245)

Variabel	Mean (M)	Std. Deviation (SD)	Min	Max	Category
Transformational Leadership (TL)	3.86	0.56	2.27	5.00	High
Instructional Leadership (IL)	3.75	0.57	1.86	5.00	High
Distributed Leadership (DL)	3.61	0.62	1.95	5.00	Moderate-High
Adaptive Leadership (AL)	3.78	0.56	2.28	5.00	High
Educational Quality Outcome (EQO)	3.95	0.48	2.63	5.00	High

Note: Category based on interval scale: 1.00-2.33 = Low; 2.34-3.67 = Moderate; 3.68-5.00 = High

Correlation Analysis

To determine the bivariate relationship between each dimension of leadership and Educational Quality Outcomes (EQO), a Pearson product analysis was used. As shown in Table 3, all four leadership dimensions indicate a positive correlation that is statistically significant with EQO. Adaptive Leadership ($r = 0.357$, $p < 0.001$), Instructional Leadership ($r = 0.319$, $p < 0.001$), and Distributed Leadership ($r = 0.243$, $p < 0.001$) all showed a strong correlation with Transformational Leadership ($r = 0.490$, $p < 0.001$). The inter-predictor correlation remained low ($r = -0.030$ to $r = 0.068$), indicating that there is no multicollinearity problem.

Table 3. Pearson Correlation Matrix

Variabel	TL	IL	DL	AL	EQO
Transformational Leadership (TL)	1.000	.066	-	.068	.490**
Instructional Leadership (IL)	—	1.000	.018	.018	.319**
Distributed Leadership (DL)	—	—	1.00	-	.243**
Adaptive Leadership (AL)	—	—	0	1.00	.357**
Educational Quality Outcome (EQO)	—	—	—	0	1.000

Note: $p < .001$ (two-tailed)

4.1. Multiple Linear Regression Analysis

The multiple line regression is used to determine the individual and collective predictive contributions of the four dimensions of leadership with respect to the educational quality results. As shown in Table 4, the whole regression model is statistically significant ($F(4, 240) = 57.847$, $p < 0.001$). This model explains 49.1% of the variations in EQO ($R^2 = 0.491$, adjusted $R^2 = 0.482$). This demonstrates the substantial explanation of the capability of the integrative leadership. Transformational Leadership emerged as the most significant predictor at the individual level ($\beta = 0.394$, $p < 0.001$), followed by Adaptive Leadership ($\beta = 0.285$, $p < 0.001$), Instructional Leadership ($\beta = 0.236$, $p < 0.001$), and Distributed Leadership ($\beta = 0.201$, $p < 0.001$). The four dimensions mentioned make a unique and significant contribution to the evaluation of educational quality outcomes, which highlights the integrative and multifaceted nature of the SMK school principal's effective leadership.

Table 4. Multiple Linear Regression: Predictors of Educational Quality Outcomes

Predictor	B (Unstandardized)	β (Standardized)	<i>t</i>	<i>p</i>
Constant	-0.262	—	1.14	.256
Transformational Leadership	0.394	.413	8.72	< .001
Instructional Leadership	0.236	.280	5.91	< .001
Distributed Leadership	0.201	.260	5.49	.003
Adaptive Leadership	0.285	.332	7.01	< .001

Note: $R^2 = .491$; Adjusted $R^2 = .482$; $F(4, 240) = 57.847$, $p < .001$

One-Way ANOVA: Differences Across Respondent Groups

ANOVA analysis is used to determine whether there are significant differences in the perception of educational quality among the three respondent groups. The results show a statistically significant group difference, $F(2, 242) = 3.422$, $p < 0.05$ (Table 5). Industry stakeholders ($M = 3.72$, $SD = 0.62$), highest average EQO perception ($M = 3.94$, $SD = 0.53$), and teachers ($M = 3.74$, $SD = 0.59$).

Table 5. Educational Quality Outcome by Respondent Group

Source	SS	df	MS	<i>F</i>	<i>p</i>
Between Groups	2.294	2	1.147	3.42	.034
Within Groups	81.107	242	0.335		
Total	83.401	244			

Respondent Group	<i>n</i>	<i>M</i>	<i>SD</i>
Principals	82	3.94	0.53
Teachers	118	3.74	0.59
Total	83.401	244	

Discussion

According to the larger empirical evidence on school leadership effectiveness, Transformational Leadership is the strongest individual predictor of Educational Quality Outcomes ($\beta = .413$, $p < .001$). Essential characteristics that are directly linked to improved institutional performance include inspiring motivation, individualised consideration, and visionary direction-setting. The transformational principal's ability to communicate a compelling vision that connects educational aspirations with industry relevance appears to be the fundamental motivational architecture that underpins all other quality-improvement initiatives in the SMK environment. This result is consistent with the findings of (Fitri Wahyuni et al., 2021) who found that transformational leadership significantly improved teacher performance and professional learning communities in Indonesian secondary schools. They also extended their findings to the field of vocational education.

SMK principals in the study sample are generally perceived as demonstrating these behaviors, according to the relatively high descriptive mean for transformational leadership ($M = 3.86$). However, the standard deviation ($SD = 0.56$) suggests meaningful variance, suggesting that not all principals deploy transformational practices with equal consistency. This variance has direct implications for leadership development programming: targeted strength interventions. Adaptive leadership's second-highest predictive contribution ($\beta = .332$, $p = .001$) is a theoretically significant result. This is especially true considering the post-pandemic and Industry 5.0 environments where Indonesian SMK institutions are currently

operating. Adaptive leadership, demonstrated by the ability to adapt to changing rules, manage crises, and readiness for digital transformation, has become an important competency in the rapidly evolving educational environment. Current empirical findings support this belief in the context of vocational education organizations in Indonesia.

These results align well with the Ministry of Education and Culture's School Leadership Program (2025), which explicitly describes principals as leaders who must manage the complexities of day-to-day institutional governance while addressing the demands of Industry 5.0. It is clear that the leadership development curriculum for vocational high school principals must integrate adaptive capacity building as a key component. This means that the curriculum must move beyond a static competency framework and toward a dynamic and situationally responsive leadership preparation model.

Instructional Leadership ($\beta = 0.280$) and Distributed Leadership ($\beta = 0.260$) demonstrated significant, albeit relatively moderate, predictive contributions to educational quality outcomes. Theoretically, this pattern can be interpreted as follows: instructional leadership, which encompasses learning environment management, teacher professional development, and curriculum oversight, serves as a structurally supportive condition that maintains pedagogical quality independent of the principal's personal preferences. These results corroborate meta-analytic conclusion that instructional leadership consistently and positively influences teacher attitudes and performance.

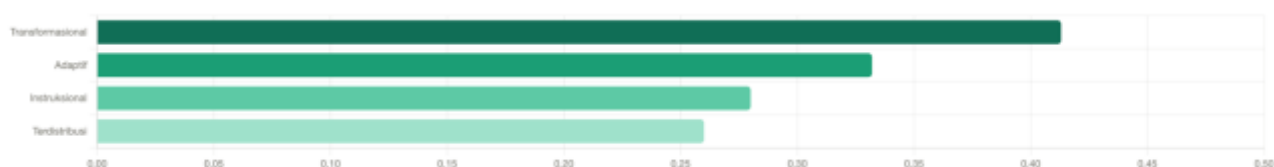


Figure 1. Predictive contribution of standardized β multiple regression

These findings also provide cross-contextual validity for vocational education settings in Indonesia. The significant contribution of Distributed Leadership further affirms that sustainable educational quality in SMK institutions is not solely a function of hierarchical principal authority, but rather emerges from collaborative decision-making architectures and shared accountability structures (Silvia et al., 2025). This is particularly salient for vocational education institutions, where the breadth of operational domains spanning academic curriculum, industry partnerships, student career development, and community engagement inherently exceeds the governance capacity of any single leader. Distributing leadership functions across department heads, senior teachers, and industry liaison officers thus constitutes a structural quality mechanism, not merely a management preference.

According to the collective regression model ($R^2 = .491$), no single leadership aspect is sufficient to explain educational quality outcomes in vocational high schools; instead, the combination of transformational, instructional, distributed, and adaptive leadership practices produces the most significant quality improvement. This finding directly addresses the theoretical gap in the literature review and provides empirical validation for the research construct of integrative leadership.

The Integrative Leadership Model for Vocational High School Principals can be described as a four-pillar framework: (1) Transformational Leadership instills motivation and vision; (2) Instructional Leadership enforces pedagogical quality standards in the classroom and curriculum; and (3) Distributed Leadership creates a collaborative governance structure that sustains quality beyond tenure. When combined, these dimensions function as a mutually reinforcing system, rather than parallel paths. This aligns with (Imron et al., 2025) notion that

integrated leadership functions produce better qualitative outcomes than a single paradigm approach.

Principals reported higher perceptions of educational quality than teachers and industry stakeholders, according to the one-way ANOVA ($F(2, 242) = 3.422, p < 0.05$). Theoretically, this difference in perceptions can be interpreted through the lens of social desirability bias and positional proximity. For example, as institutional leaders, principals may have more optimistic quality assessments, reflecting their efforts to build a narrative of institutional success, while teachers and industry stakeholders who work on the front lines of teaching and external interfaces apply more restrictive evaluation criteria.

This finding has significant policy implications. It suggests that a quality monitoring system that relies solely on principals' self-assessments may systematically overestimate institutional performance, reinforcing the need for a multi-stakeholder quality evaluation framework that incorporates the perspectives of teachers and industry partners as primary data sources. This recommendation aligns directly with the SMK Center of Excellence program's emphasis on interconnected and appropriate accountability mechanisms, which include feedback from industry partners as a formal quality indicator (Ministry of Education and Culture, 2023).

CONCLUSIONS

This study shows that integrative leadership which encompasses adaptive, distributed, transformational, and instructional aspects significantly and collectively predicts improvements in the quality of sustainable education in Indonesian vocational high schools, accounting for 49.1% of the variance in outcomes. Significant differences in perceptions across stakeholder groups further underscore the importance of multi-stakeholder accountability mechanisms. Transformational leadership emerged as the strongest predictor, followed by adaptive, instructional, and distributed leadership. These four paradigms confirm that no single paradigm is sufficient, and that a synergistic combination of the four dimensions provides the strongest foundation for developing vocational high school quality. This study offers a theoretically grounded and practically actionable integrative leadership model for the development of vocational high school principals in Indonesia. Further research is recommended to expand the model's validity through a longitudinal design and a broader ASEAN comparative context.

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AUTHOR CONTRIBUTIONS

Conceptualization, K. and J.; methodology, K.; software, K.; validation, K., J., S., and D.; formal analysis, K.; investigation, K. and J.; resources, S. and D.; data curation, K.; writing original draft preparation, K.; writing review and editing, J., S., and D.; visualization, K.; supervision, J.; project administration, K. and S.; funding acquisition, K. All authors have read and agreed to the published version of the manuscript.

Note. K. = Kurnianti; J. = Jamaluddin; S. = Sukaena; D. = Darmawan. All authors are affiliated with Universitas Negeri Makassar, Makassar, Indonesia.

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