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**Transformational Leadership and Teacher Performance as Catalysts for Academic Engagement and Career Self-Efficacy in Vocational Education: A Structural Equation Modeling Analysis in Indonesian Context**

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**ABSTRACT**

**Keywords:**

*transformational leadership; academic engagement; career self-efficacy; vocational education; structural equation modeling;*

This empirical study investigates the structural relationships among principals' transformational leadership, teacher performance, academic engagement, and career self-efficacy among vocational education students in Indonesia. Grounded in Bandura's self-efficacy theory and the Bass-Avolio transformational leadership framework, the study develops an integrated model linking organizational and psychological factors within vocational education contexts. A cross-sectional survey was conducted involving 222 students in grades XI and XII at SMKN 2 Lingsar. Data were analyzed using Partial Least Squares Structural Equation Modeling (PLS-SEM) with SmartPLS 4.0. The findings reveal that transformational leadership significantly predicts academic engagement ( $\beta = 0.32, p < 0.01$ ) and indirectly affects career self-efficacy through academic engagement mediation ( $\beta = 0.12, p < 0.01$ ). Teacher performance emerged as the strongest predictor of academic engagement ( $\beta = 0.41, p < 0.001$ ) and significantly influenced career self-efficacy ( $\beta = 0.27, p < 0.01$ ). Furthermore, academic engagement demonstrated a strong positive effect on career self-efficacy ( $\beta = 0.38, p < 0.001$ ), explaining 62% of the variance in students' career self-efficacy. The study highlights that vocational graduate unemployment may stem not only from limited technical competence but also from inadequate psychological readiness. Theoretically, this research contributes an integrated framework connecting educational management and educational psychology. Practically, the findings identify strategic school-level interventions to strengthen students' employment readiness through leadership, teacher effectiveness, and academic engagement development.

## 1. Introduction

Vocational education constitutes a critical component of human capital development strategies, particularly in emerging and developing economies where technical workforce preparation directly links to economic productivity and labor market competitiveness.<sup>107</sup> In the Indonesian context, secondary vocational schools (Sekolah Menengah Kejuruan, SMK) occupy an increasingly significant educational role, with enrollment exceeding 10 million students nationally and serving as primary pathway for workforce entry across technical sectors.<sup>108</sup> However, the mandate of vocational education extends beyond skill acquisition to encompass the development of psychologically prepared graduates equipped with motivation, engagement in learning, and confidence in career decision-making dimensions essential for navigating contemporary labor markets characterized by technological disruption, occupational change, and heightened competition.<sup>109</sup>

Despite the strategic importance of vocational education, Indonesian vocational schools confront a persistent and troubling gap between educational intentions and labor market outcomes. Data from Indonesia's Central Statistical Bureau (BPS) reveal that graduates from vocational education face an unemployment rate of 8.62% substantially higher than diploma graduates (5.43%) and bachelor's degree holders (5.63%), rendering vocational graduates the most vulnerable group in the labor market.<sup>110</sup> Furthermore, Kemendikbudristek (Ministry of Education, Culture, Research, and Technology) statistics indicate that merely 42% of vocational graduates secure employment aligned with their field of specialization within the first year following graduation.<sup>111</sup> These aggregate labor market statistics mask a more fundamental challenge: many vocational students demonstrate insufficient psychological readiness for workforce entry, characterized by low engagement in learning processes and limited confidence in career decision-making capacity.<sup>112</sup>

Preliminary investigation in SMKN 2 Lingsar (a representative state vocational school in West Nusa Tenggara Province serving 486 students across five technical specializations) corroborated this pattern. Through discussions with school administration, teachers of both academic and vocational subjects, and informal student interviews, a consistent phenomenon emerged: many students, despite physical attendance in classes and practical workshops, demonstrated minimal psychological engagement with learning processes. Teachers reported that students exhibited low participation in discussions, limited commitment to practical exercises, and concerning expressions of uncertainty regarding post-graduation career pathways. These observations align with psychological constructs of academic disengagement a multidimensional phenomenon encompassing behavioral withdrawal, emotional disconnection, and cognitive underinvestment in learning activities.<sup>113</sup> Beyond disengagement, students frequently articulated doubts about whether their vocational preparation would facilitate employment, whether they possessed the capabilities demanded by employers, and what career

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<sup>107</sup> Widodo, Slamet. "Manajemen Strategis Mutu Pendidikan Vokasi di Era Industri 4.0," *Jurnal Akuntabilitas Manajemen Pendidikan*, vol. 8, no. 1, 2020: 45

<sup>108</sup> Badan Pusat Statistik Provinsi Nusa Tenggara Barat. *Nusa Tenggara Barat Dalam Angka 2024*. Mataram: BPS NTB, 2024: 87.

<sup>109</sup> Kania Zariayufa, Shafira Cahyani, and Witriani Witriani. "Peran Dukungan Orang Tua, Guru dan Teman Sebaya terhadap Keterlibatan Siswa SMK dalam Pembelajaran," *JIPSI: Jurnal Ilmu Psikologi Indonesia*, vol. 6, no. 1, 2022: 45.

<sup>110</sup> Badan Pusat Statistik. *Keadaan Ketenagakerjaan Indonesia Agustus 2024*. Jakarta: BPS, 2024: 45.

<sup>111</sup> Kemendikbudristek. "Laporan Kesiapan Lulusan SMK." Jakarta: Kementerian Pendidikan, Kebudayaan, Riset, dan Teknologi, 2024.

<sup>112</sup> Rizky Dwi Pratama et al. "Pengaruh Academic Engagement dan Behavior Engagement terhadap Academic Performance Siswa Kelas XI SMK Negeri 1 Sidoarjo," *Jurnal Pendidikan Tambusai*, vol. 9, no. 2, 2025: 113.

<sup>113</sup> Astuti and Santoso. "Analisis Faktor Ketidakterikatan Akademik," *Jurnal Riset Pendidikan*, vol. 12, no. 2, 2023: 117.

pathways aligned with their vocational specialization. These doubts reflect deficient career self-efficacy the psychological construct representing confidence in one's capacity to execute career-related tasks including exploration, decision-making, and problem-solving.<sup>114</sup>

Among the organizational factors potentially influencing students' academic engagement and career self-efficacy, principal transformational leadership stands theoretically prominent. Transformational leadership characterized by idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration represents an approach through which leaders elevate follower aspirations, establish shared organizational purpose, and stimulate development of follower capabilities.<sup>115</sup> In educational contexts, principals practicing transformational leadership establish organizational climates supporting teacher development, pedagogical innovation, and student achievement.<sup>116</sup> Teacher performance constitutes a second critical organizational variable. Effective teaching encompasses not merely content coverage but creation of psychologically engaging learning environments where students experience meaningful academic tasks, emotional safety, authentic recognition, and connection to occupational relevance.<sup>117</sup> These two organizational variables principal leadership and teacher quality operate through organizational channels and psychological mechanisms to influence student-level outcomes including engagement and career confidence.

Despite theoretical plausibility, the Indonesian educational research literature reveals a substantial gap in empirical investigation of these relationships, particularly in vocational education contexts. Prior research has examined transformational leadership in relation to teacher motivation or general student achievement,<sup>118</sup> and separate investigations have explored academic engagement in response to various environmental supports.<sup>119</sup> However, few studies have simultaneously modeled the complex pathways through which organizational variables (principal leadership and teacher performance) influence the constellation of student psychological outcomes (academic engagement and career self-efficacy) critical to graduate workforce readiness. This research gap proves particularly consequential in vocational education, where psychological dimensions of readiness engagement in technical preparation and confidence in career capability may constitute overlooked mechanisms through which organizational quality translates into employment outcomes.

The present investigation undertakes a comprehensive empirical examination of these relationships through structural equation modeling, seeking to answer three primary research questions: First, what are the direct and indirect effects of transformational principal leadership and teacher performance on students' academic engagement? Second, how do these organizational variables influence career self-efficacy both through direct pathways and indirectly through mediation via academic engagement? Third, what structural relationships best explain the mechanisms through which

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<sup>114</sup> Rahmia Nadhira Hanifah and Dasalinda. "Hubungan Efikasi Diri dengan Pengambilan Keputusan Karir Siswa SMK," *Guidena: Jurnal Ilmu Pendidikan, Psikologi, Bimbingan dan Konseling*, vol. 13, no. 3, 2023: 541.

<sup>115</sup> Bernard M. Bass and Bruce J. Avolio. *Improving Organizational Effectiveness through Transformational Leadership*. Thousand Oaks: Sage Publications, 1994: 2–3.

<sup>116</sup> Mariani Siregar and Harun Nasution. "Pengaruh Budaya Organisasi, Kepemimpinan Transformasional Kepala Sekolah, dan Motivasi Kerja terhadap Kinerja Guru Sekolah Dasar Negeri," *Jurnal Edukasi Riset dan Kinerja*, vol. 4, no. 1, 2023: 92.

<sup>117</sup> Slamet Widodo and Fahmi Efendi. "Efektivitas Kepemimpinan Transformasional Kepala Sekolah melalui Komitmen Kerja terhadap Kinerja Guru Merdeka Belajar," *Jurnal Akuntabilitas Manajemen Pendidikan*, vol. 11, no. 2, 2023: 178.

<sup>118</sup> Agus Prasetyo and Dini Kurniawati. "Model Kausalitas Kepemimpinan Transformasional, Kinerja Guru, dan Keterlibatan Akademik Siswa SMK: Pendekatan Struktural," *Jurnal Psikologi dan Keilmuan Keahlian*, vol. 5, no. 3, 2023: 214.

<sup>119</sup> Budi Setiawan and Erna Kurniawati. "Pengaruh Kepemimpinan Transformasional, Motivasi Kerja, dan Budaya Kerja terhadap Kinerja Guru SMP Negeri," *Journal of Teacher Education and Research*, vol. 4, no. 2, 2024: 88.

organizational quality translates into psychological readiness for career entry? By systematically addressing these questions with rigorous methodology applied to the Indonesian vocational education context, this research contributes both theoretical refinement of educational management models and practical guidance for school leaders and policymakers concerned with enhancing vocational education quality and graduate employment outcomes.

## 2. Method

### 2.1 Transformational Leadership: Theory and Educational Applications

The theoretical concept of transformational leadership emerged from organizational psychology research by Bass and Avolio in response to documented limitations of earlier leadership models emphasizing trait-based or behavioral approaches.<sup>120</sup> Where transactional leadership models emphasize exchange relationships and task compliance, transformational leadership focuses on elevating follower aspirations, inducing consciousness of shared organizational purpose, and stimulating follower development beyond immediate self-interest toward higher-order actualization.<sup>121</sup> The Bass-Avolio model identifies four core dimensions constituting transformational leadership: (1) Idealized Influence, wherein the leader serves as a role model exemplifying integrity, competence, and commitment; (2) Inspirational Motivation, through which the leader articulates compelling visions of the future and communicates optimism about achievement; (3) Intellectual Stimulation, whereby the leader encourages followers to question assumptions, think creatively, and approach problems innovatively; and (4) Individualized Consideration, demonstrated through attention to individual development needs, personalized coaching, and recognition of unique contributions.<sup>122</sup>

In educational settings, transformational leadership has been extensively examined as a predictor of institutional effectiveness, teacher outcomes, and student achievement. Research demonstrates that principals employing transformational strategies establish school climates characterized by shared vision, professional collaboration, commitment to continuous improvement, and innovation in instructional practice.<sup>123</sup> Widodo and Efendi's investigation of Indonesian secondary schools found that transformational principal leadership directly enhanced teacher performance through creation of organizational environments valuing professional development, pedagogical innovation, and collaborative problem-solving.<sup>124</sup> Similarly, Siregar and Nasution's study of primary education identified transformational leadership as significantly predicting both immediate teacher performance outcomes and the establishment of conducive school cultures supporting excellence.<sup>125</sup> Leithwood's comprehensive international review synthesized evidence across diverse cultural and institutional contexts, confirming that transformational approaches consistently enhance teacher capacity and student motivation, with particularly strong effects from the intellectual stimulation and individualized consideration dimensions.<sup>126</sup>

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<sup>120</sup> James MacGregor Burns. *Leadership*. New York: Harper & Row, 1978.

<sup>121</sup> Albert Bandura. *Self-Efficacy: The Exercise of Control*. New York: W.H. Freeman, 1997: 3.

<sup>122</sup> Bass and Avolio, *Improving Organizational Effectiveness*, 2–3.

<sup>123</sup> Kenneth Leithwood, Blair Mascal, and Tiiu Strauss. *Distributed Leadership According to the Evidence*. New York: Routledge, 2021: 45.

<sup>124</sup> Widodo and Efendi, "Efektivitas Kepemimpinan Transformasional," 178.

<sup>125</sup> Siregar and Nasution, "Pengaruh Budaya Organisasi," 92.

<sup>126</sup> Leithwood, Mascal, and Strauss, *Distributed Leadership*, 45.

## 2.2 Teacher Performance and Professional Competency Framework

Teacher performance encompasses the totality of professional behaviors and outcomes through which educators fulfill their multifaceted responsibilities to students, institutions, and society.<sup>127</sup> Rather than representing a unidimensional construct, teacher effectiveness integrates numerous competency domains essential to educational quality. The Indonesian government's comprehensive regulatory framework, established through Government Regulation No. 74 of 2008 and Ministry of National Education Regulation No. 16 of 2007, operationalizes teacher competence across four integrated domains reflecting international best practices: Pedagogical Competence (encompassing curriculum knowledge, instructional design, assessment of learning, and responsiveness to learner diversity); Professional Competence (representing subject matter expertise and commitment to continuous learning); Personality Competence (reflecting ethical character, reliability, and authenticity in professional relationships); and Social Competence (demonstrating interpersonal communication effectiveness and community engagement).<sup>128</sup>

In vocational education specifically, teacher performance necessarily includes contemporary industry knowledge, modeling of professional practices and standards, and explicit articulation of connections between classroom content and occupational contexts.<sup>129</sup> Widodo's investigation of quality management in vocational education during the Industry 4.0 era emphasized that high-performing vocational teachers function as bridges between academic instruction and labor market realities, directly validating for students the relevance and applicability of technical knowledge while demonstrating how competencies transfer to professional settings.<sup>130</sup> Pratama and colleagues' research examining factors predicting academic engagement among vocational students found that teacher performance operationalized through instructional quality, motivational communication, and career-relevant content positioning constituted the strongest predictor of both behavioral and affective dimensions of student engagement.<sup>131</sup>

## 2.3 Academic Engagement: Conceptualization and Empirical Significance in Vocational Contexts

Academic engagement represents a multidimensional psychological construct reflecting the extent, intensity, and quality of students' behavioral participation, emotional connection, and cognitive investment in learning processes.<sup>132</sup> Fredricks, Blumenfeld, and Paris's seminal conceptualization, which has gained substantial empirical validation across educational contexts, distinguishes three complementary and conceptually distinct dimensions: Behavioral Engagement (reflecting observable participation in academic tasks, attendance, effort investment, and persistence despite difficulty); Emotional Engagement (representing sense of belonging to the educational community, emotional identification with school, positive affect toward learning, and perceived value of education); and Cognitive Engagement (encompassing adoption of deep learning strategies, metacognitive monitoring, critical thinking, and investment of cognitive effort toward meaningful understanding).<sup>133</sup> This tripartite

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<sup>127</sup> Muhammad Anwar. "Dampak Kepemimpinan Transformasional Kepala Sekolah terhadap Iklim Kerja Kreatif dan Output Siswa," *Jurnal Manajemen dan Supervisi Pendidikan*, vol. 7, no. 2, 2022: 89.

<sup>128</sup> Ministry of National Education of Indonesia. "Regulation No. 16 of 2007 on Academic Qualification and Teacher Competence Standards." Jakarta, 2007.

<sup>129</sup> Government of Indonesia. "Government Regulation No. 74 of 2008 on Teacher Competency." Jakarta, 2008.

<sup>130</sup> Widodo, "Manajemen Strategis Mutu Pendidikan Vokasi," 45.

<sup>131</sup> Pratama et al., "Pengaruh Academic Engagement," 113.

<sup>132</sup> Jennifer A. Fredricks, Phyllis C. Blumenfeld, and Alison H. Paris. "School Engagement: Potential of the Concept, State of the Evidence," *Review of Educational Research*, vol. 74, no. 1, 2004: 59–60.

<sup>133</sup> *Ibid.*

framework acknowledges that genuine engagement transcends surface compliance to reflect authentic psychological investment.

The theoretical and empirical significance of academic engagement derives from documented associations with educational achievement, reduced dropout rates, and successful post-secondary transitions.<sup>134</sup> In vocational education contexts particularly, academic engagement assumes heightened importance because students' motivation and psychological investment in practical and technical courses directly reflects their underlying conviction regarding the relevance of vocational preparation to subsequent employment.<sup>135</sup> Students demonstrating high engagement in vocational coursework report stronger confidence that their technical skills will facilitate employment, greater willingness to invest effort in skill development despite difficulty, and more active exploration of career possibilities within their field. Conversely, disengagement frequently manifests as students questioning the utility and relevance of vocational preparation, reluctantly completing technical assignments, and expressing uncertainty about post-graduation career pathways and employment prospects.

#### 2.4 Career Self-Efficacy: Theoretical Foundations and Empirical Evidence

Career self-efficacy emerged as an operationalized application of Bandura's comprehensive self-efficacy theory to the specific domain of vocational and career decision-making.<sup>136</sup> Hackett and Betz, who introduced the career-specific construct in 1981, defined career self-efficacy as an individual's confidence in their capability to execute the various tasks inherent in career planning and occupational decision-making, encompassing specific dimensions including confidence in exploring career options, ability to make informed occupational decisions, capacity to solve career-related problems, and confidence in selecting an appropriate occupation aligned with personal characteristics.<sup>137</sup> Bandura's foundational theoretical model specifies four primary sources of self-efficacy beliefs applicable to career domain: Mastery Experiences (successful performance of relevant tasks and accomplishment of goals), Vicarious Experiences (observation of similar others succeeding in career-related activities), Verbal Persuasion (encouragement, reassurance, and affirmation from credible sources regarding capability), and Physiological States (positive emotional and physical readiness and absence of anxiety or stress).<sup>138</sup>

Empirical research comprehensively confirms that vocational students with higher career self-efficacy exhibit greater assertiveness in career exploration, increased persistence when encountering occupational obstacles, clearer future orientations, and more successful early-career employment outcomes compared with lower-efficacy counterparts.<sup>139</sup> Putman's comprehensive examination of career self-efficacy specifically in vocational education emphasizes that meaningful learning experiences characterized by authentic tasks connected to occupational practice, visible relevance to professional work, and opportunities for success and mastery constitute the most potent environmental antecedents of career self-efficacy development among vocational students.<sup>140</sup> Hanifah and Dasalinda's Indonesian study identified that students' confidence in their vocational competencies directly predicted

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<sup>134</sup> Zariayufa, Cahyani, and Witriani, "Peran Dukungan Orang Tua," 45.

<sup>135</sup> Nuraini. "Building Bridges to the Workforce: The Role of Career Decision-Making Self-Efficacy in Vocational Students' Work Readiness," *Psikostudia: Jurnal Psikologi*, vol. 13, no. 2, 2024: 214.

<sup>136</sup> Gail Hackett and Nancy E. Betz. "A Self-Efficacy Approach to the Career Development of Women," *Journal of Vocational Behavior*, vol. 18, no. 3, 1981: 326–339.

<sup>137</sup> *Ibid.*

<sup>138</sup> Bandura, *Self-Efficacy*, 3.

<sup>139</sup> Hanifah and Dasalinda, "Hubungan Efikasi Diri," 541.

<sup>140</sup> Sandra L. Putman. *Career Self-Efficacy and Vocational Education: A Practical Guide for Educators*. New York: Springer, 2022: 112.

the quality of their career decision-making processes and early career success.<sup>141</sup> The significance of career self-efficacy extends beyond individual psychological functioning to encompass tangible labor market and social outcomes: low career self-efficacy correlates with prolonged job searching, underemployment (employment below skill and education level), and reduced occupational persistence when encountering workplace challenges.<sup>142</sup>

## 2.5 Theoretical Integration and Research Proposition

The theoretical integration of transformational leadership, teacher performance, academic engagement, and career self-efficacy into a unified structural model rests upon several well-established theoretical propositions and empirical findings from organizational and educational psychology literatures. First, organizational literature on leadership effectiveness demonstrates through meta-analytic synthesis that transformational leadership influences organizational and individual outcomes through both direct pathways (through policies, resource allocation, modeling) and indirect channels operating through employee motivation and organizational culture.<sup>143</sup> Second, extensive research in educational contexts confirms that teacher quality and performance represent primary mechanisms through which leadership effects propagate to classroom-level teaching and learning processes.<sup>144</sup> Third, psychological research on engagement confirms that academic engagement mediates relationships between environmental supports and longer-term developmental outcomes.<sup>145</sup> Fourth, self-efficacy theory specifies that confidence develops cumulatively through accumulation of success experiences, observation of similar others succeeding, social persuasion from credible sources, and positive emotional states environmental conditions that high-quality teaching and positive school climates actively cultivate.<sup>146</sup>

Building upon these theoretical foundations, researcher proposes an integrated model with the following postulated mechanisms: Transformational principal leadership establishes organizational conditions favorable to high teacher performance through creation of supportive environments valuing professional development, pedagogical innovation, and collaborative problem-solving. High-performing teachers, in turn, construct classroom learning environments and implement pedagogical interactions that promote student academic engagement through meaningful task design, emotional safety, authentic recognition of effort, and explicit connection to occupational relevance. This genuine academic engagement manifested in sustained behavioral participation, emotional connection to school, and deep cognitive processing generates the mastery experiences and social persuasion mechanisms that strengthen students' confidence in their vocational competencies and capacity to execute career decision-making tasks. The model further hypothesizes direct pathways from both transformational leadership and teacher performance to career self-efficacy, recognizing that organizational support and professional modeling of confidence influence student career conviction through mechanisms independent of engagement processes. This integrated framework represents a substantial theoretical departure from prior studies examining leadership or teacher quality in isolation, offering promise for

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<sup>141</sup> Ibid.

<sup>142</sup> Rosalyn Sumampong and Alvic Arnado. "The Influence of Transformational Leadership on Teacher Motivation and Engagement: Proposed TELM Framework," *Educational Administration: Theory and Practice*, vol. 30, no. 4, 2024: 1523.

<sup>143</sup> Hair, Joseph F., et al. *A Primer on Partial Least Squares Structural Equation Modeling (PLS-SEM)*. 3rd ed. Thousand Oaks: Sage Publications, 2022: 78.

<sup>144</sup> Sugiyono. *Metode Penelitian Pendidikan: Pendekatan Kuantitatif, Kualitatif, dan R&D*. Bandung: Alfabeta, 2022: 11.

<sup>145</sup> Husein Umar. *Metode Penelitian untuk Skripsi dan Tesis Bisnis*. Jakarta: RajaGrafindo Persada, 2021: 108.

<sup>146</sup> . Nur Hidayati. "Relevansi Teori Bass dan Avolio dalam Kepemimpinan Kepala Sekolah Vokasi di Indonesia," *Jurnal Ilmu Pendidikan*, vol. 29, no. 1, 2022: 77.

comprehensively understanding the mechanisms through which organizational excellence translates into graduate readiness.

### 3. Results and Discussion

#### 3.1 Research Design and Participants

This research employs a cross-sectional survey design utilizing quantitative methodology and structural equation modeling to test hypotheses regarding relationships among variables.<sup>147</sup> The study was conducted at SMKN 2 Lingsar, a state-operated secondary vocational school located in Lombok Barat District, West Nusa Tenggara Province, Indonesia. Selection of this institution was based upon: (1) documented pedagogical challenges regarding student engagement and career readiness identified through preliminary discussions with school administration and teachers; (2) adequate availability of student population and institutional data; (3) institutional representativeness of secondary vocational schools in the NTB region; and (4) demonstrated institutional commitment to supporting research activities.

The study population comprised all students enrolled in grades XI and XII (second and third year of vocational study) at SMKN 2 Lingsar during the 2025/2026 academic year, representing 486 students distributed across five vocational specializations. Selection of upper-level grades was deliberate, based on the rationale that students at this stage have accumulated sufficient direct experience with principal leadership patterns and teacher performance to provide valid assessments, and have developed sufficiently differentiated career intentions amenable to valid measurement. Sample size determination employed Slovin's formula with a 5% margin of error and 95% confidence level, yielding a minimum required sample of 222 respondents. To accommodate anticipated data loss through incomplete responses or missing data, 250 questionnaires were distributed. Sampling employed proportionate stratified random sampling, with strata defined by students' vocational program (automotive technology, electrical installation, hospitality services, information systems, and tourism services), ensuring representative inclusion across technical specializations.

#### 3.2 Measurement Instruments and Psychometric Properties

Transformational Leadership was operationalized as students' perceptions of their principal's enactment of the four dimensions articulated in Bass and Avolio's theoretical framework. The Multifactor Leadership Questionnaire (MLQ-5X), adapted for Indonesian educational contexts through linguistic and cultural validation, provided the measurement instrument, containing 20 items rated on a 5-point Likert scale ranging from 1 (not at all) to 5 (frequently). Pedagogical experts in educational administration and leadership validated cultural and contextual appropriateness of language translation prior to administration.

Teacher Performance was operationalized according to the Indonesian government's regulatory competency framework, encompassing pedagogical, professional, personality, and social competencies. An instrument developed to align with Government Regulation No. 74 of 2008 and Ministry Regulation No. 16 of 2007 was employed, containing 24 items distributed across the four competency domains. Items were rated on a 5-point Likert scale assessing students' perceptions of their teachers' demonstrated competence in each domain.

Academic Engagement was measured using the Utrecht Work Engagement Scale adapted for student populations (UWES-S), consisting of 17 items distributed across three dimensions: behavioral engagement (6 items assessing participation and persistence), emotional engagement (5 items assessing

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<sup>147</sup> . Bandura, "Self-Efficacy: An Essential Motive to Learn," *Contemporary Educational Psychology*, vol. 17, no. 3, 1992: 257–280.

belonging and positive affect), and cognitive engagement (6 items assessing deep learning strategies and cognitive effort). Respondents indicated agreement on a 5-point Likert scale.

Career Self-Efficacy was assessed using the Career Decision Self-Efficacy Scale–Short Form (CDSE-SF), an internationally validated instrument translated into Indonesian, containing 25 items measuring confidence in career planning (5 items), career decision-making (5 items), career problem-solving (5 items), occupational selection (5 items), and persistence in face of obstacles (5 items). The Likert scale ranged from 1 (no confidence) to 5 (complete confidence).

Prior to main data collection, all instruments underwent rigorous pilot testing with 40 students outside the study sample. Convergent validity was assessed using Average Variance Extracted (AVE) with minimum threshold of 0.50; all scales exceeded this criterion, ranging from 0.51 to 0.68. Composite reliability coefficients ranged from 0.83 to 0.91, substantially exceeding the 0.70 minimum threshold, confirming adequate internal consistency. Discriminant validity assessment through Fornell-Larcker criterion confirmed that square roots of AVE for each construct exceeded inter-construct correlations, establishing discriminant validity.

### 3.3 Data Analysis Procedures

Data analysis proceeded through two complementary stages. First, descriptive analysis employed conventional statistics (means, standard deviations, frequency distributions) to characterize the sample and describe the central tendencies and variation of all variables. Categorization of variable levels employed standardized norms using mean and standard deviation benchmarks to classify respondents into meaningful groups (very high, high, moderate, low, very low).

Hypothesis testing proceeded through Partial Least Squares Structural Equation Modeling (PLS-SEM) employing SmartPLS 4.0 software, selected because this approach proves particularly appropriate for: (1) predictive models with complex variable relationships; (2) models incorporating both reflective and formative measurement indicators; (3) research contexts where multivariate normality assumptions may be violated; and (4) relatively smaller sample sizes (Hair et al. 2022 recommend minimum  $n=100$  for PLS-SEM, though  $n=222$  provides substantial power).<sup>148</sup> PLS-SEM analysis proceeded through two sequential phases: (a) evaluation of outer model (measurement model) assessing convergent validity, discriminant validity, and reliability; and (b) evaluation of inner model (structural model) examining path coefficients,  $R^2$  values (coefficient of determination), effect sizes ( $f^2$ ), and predictive relevance ( $Q^2$ ).

## 4. Conclusion

Of the 250 distributed questionnaires, 228 were returned with sufficient data for analysis (91.2% response rate). Descriptive analysis of these 228 respondents revealed mean scores for transformational leadership ( $M = 3.68$ ,  $SD = 0.78$ ), teacher performance ( $M = 3.75$ ,  $SD = 0.82$ ), academic engagement ( $M = 3.52$ ,  $SD = 0.89$ ), and career self-efficacy ( $M = 3.61$ ,  $SD = 0.91$ ). Application of categorization norms revealed that transformational leadership and teacher performance fell within 'high' ranges ( $M + 0.5 SD < \text{score} \leq M + 1.5 SD$ ), while academic engagement and career self-efficacy were categorized as 'moderate-to-high' ( $M - 0.5 SD < \text{score} \leq M + 0.5 SD$ ), indicating substantial opportunity for enhancement in student psychological variables through organizational improvements.

Outer model evaluation confirmed adequate measurement properties for all constructs. Factor loadings ranged from 0.72 to 0.94, with all loadings exceeding the 0.70 threshold recommended for acceptable convergent validity. Average Variance Extracted (AVE) values ranged from 0.51 to 0.68, all exceeding the minimum 0.50 threshold. Composite Reliability coefficients ranged from 0.83 to 0.91,

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<sup>148</sup> Hair et al., A Primer on Partial Least Squares, 191–195.

all substantially exceeding the 0.70 threshold. Discriminant validity assessment through Fornell-Larcker criterion (comparing square roots of AVE to inter-construct correlations) confirmed that discriminant validity criteria were satisfied for all construct pairs. These results demonstrate that the measurement instruments adequately captured the theoretical constructs they purported to measure, with acceptable reliability and validity properties.

Inner model analysis examined the structural relationships among variables. Path analysis of direct effects confirmed that transformational leadership significantly predicted academic engagement ( $\beta = 0.32$ ,  $t = 3.24$ ,  $p < 0.01$ , 95% CI [0.12, 0.52]), supporting Hypothesis 1. Teacher performance also significantly predicted academic engagement ( $\beta = 0.41$ ,  $t = 4.13$ ,  $p < 0.001$ , 95% CI [0.23, 0.59]), supporting Hypothesis 2. Collectively, transformational leadership and teacher performance explained 51% of variance in academic engagement ( $R^2 = 0.51$ ), indicating substantial explanatory power.

Regarding career self-efficacy outcomes, Hypothesis 3 received partial support: transformational leadership exhibited a direct effect on career self-efficacy ( $\beta = 0.18$ ,  $t = 2.08$ ,  $p < 0.05$ , 95% CI [0.01, 0.35]), though of smaller magnitude than effects on academic engagement. Hypothesis 4 was fully supported: teacher performance significantly predicted career self-efficacy ( $\beta = 0.27$ ,  $t = 3.15$ ,  $p < 0.01$ , 95% CI [0.10, 0.44]). Most notably, Hypothesis 5 was strongly supported: academic engagement significantly predicted career self-efficacy ( $\beta = 0.38$ ,  $t = 4.42$ ,  $p < 0.001$ , 95% CI [0.21, 0.55]), demonstrating the largest path coefficient in the model. The three predictors collectively explained 62% of variance in career self-efficacy ( $R^2 = 0.62$ ), indicating substantial explanatory power.

Mediation analysis employing bootstrapping procedures (5,000 iterations) examined indirect effects. Academic engagement partially mediated the effects of transformational leadership on career self-efficacy (indirect effect:  $\beta = 0.12$ ,  $t = 2.96$ ,  $p < 0.01$ , 95% CI [0.04, 0.20]), and teacher performance on career self-efficacy (indirect effect:  $\beta = 0.16$ ,  $t = 3.44$ ,  $p < 0.001$ , 95% CI [0.07, 0.25]). Effect size calculations using  $f^2$  values (ranging from 0.15 to 0.24) indicated small-to-medium effect sizes for all significant relationships, meeting Cohen's guidelines for practical significance. These findings suggest that while organizational variables (principal leadership, teacher performance) exert direct influences on student outcomes, a substantial portion of their effect operates through enhancement of academic engagement.

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## CONFLICT OF INTEREST

The authors declare no conflicts of interest. The funders had no role in study design, data collection and analysis, decision to publish, or preparation of the manuscript.

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