



Received: 6 February 2026

Revised: 25 February 2026

Accepted: 2 April 2026

LEADERSHIP AND CONTEXTUAL DETERMINANTS OF SECONDARY SCHOOL EFFECTIVENESS: A CAUSAL STRUCTURAL MODEL

Terdkiet YAMSOPHA¹, Athipong PHETSUD¹ and Pornrat LANGKASUTRA¹

¹ Doctor of Philosophy Program in Educational Administration, Pathumthani University, Thailand; yamsopa999@gmail.com (T. Y.)

Handling Editor:

Professor Madya Dr.Narentheren KALIAPPEN Universiti Utara Malaysia, Malaysia
(This article belongs to Theme 2: Public Administration in Super Smart Society)

Reviewers:

- | | |
|--|--------------------------------|
| 1) Associate Professor Dr.Apichart JAI-AREE | Kasetsart University, Thailand |
| 2) Assistant Professor Dr.Phrawachirahamakun | MCU, Thailand |

Abstract

This study develops a causal structural model to elucidate the interrelated factors driving secondary school effectiveness within the Roi Et Educational Service Area. Addressing the limitations of isolated, linear evaluations, this research employed a mixed-methods approach, predominantly utilizing structural equation modeling (SEM) to examine the complex organizational dynamics of secondary schools. Quantitative data were collected through a structured five-point Likert scale questionnaire administered to a multi-stage random sample of 323 educational administrators and teachers. Confirmatory factor analysis validated the measurement model, which encompassed administrator, teacher, student, and school-context factors across twenty observable indicators. The structural model demonstrated a robust fit to the empirical data ($\chi^2/df = 2.933$, CFI = 0.968, RMSEA = 0.077), explaining 89% of the total variance in overall school effectiveness. Crucially, the findings revealed that administrator characteristics had the greatest impact on school outcomes, followed by school organizational systems, teacher attributes, and student factors. These empirical insights significantly underscore the paramount importance of strategic educational leadership and supportive internal environments. The validated model provides a vital, evidence-based framework for policymakers to implement systemic reforms and ensure sustainable quality improvements across diverse secondary education contexts.

Keywords: School Effectiveness, Structural Equation Modeling, Educational Leadership, Secondary Education, Causal Relationship Model

Citation Information: Yamsopha, T., Phetsud, A., & Langkasutra, P. (2026). Leadership and Contextual Determinants of Secondary School Effectiveness: A Causal Structural Model. *Asian Administration and Management Review*, 9(1), Article 19. <https://doi.org/10.14456/aamr.2026.19>

Introduction

Education is one of the most crucial instruments for developing human capital and raising national competitiveness. In particular, basic education lays the foundation for students' knowledge, skills, and attributes that align with the Sustainable Development Goals and the demands of the 21st century (World Bank, 2020; United Nations Educational, Scientific and Cultural Organization, 2021; Office of the Basic Education Commission, 2022). Despite ongoing improvements, Thailand and many other countries continue to struggle with the quality of education, as evidenced by secondary school students' performance on national and international assessments (Organisation for Economic Co-operation and Development, 2023; Schleicher, 2019; Fullan, 2016).

In this context, school effectiveness is a paramount indicator of educational achievement, reflecting an institution's capacity to meet academic objectives, satisfy stakeholder expectations, and sustain overall organizational quality (Mott, 1972; Hoy & Miskel, 2013; Bush, 2011). From an organizational perspective, schools operate as complex social systems profoundly shaped by the continuous interactions among their internal processes and structures and their external environments (Cheng, 1996; Owens & Valesky, 2014). Accordingly, school effectiveness is increasingly recognized as a multifaceted outcome driven primarily by strategic leadership and contextual determinants—such as the school environment and administrative support—working in tandem with teacher aptitude and student attributes (Cherrington, 1994; McMillan & Schumacher, 2010; Leithwood et al., 2020).

The leadership and management skills of administrators are crucial for establishing goals, allocating resources, and encouraging school progress, according to empirical research (Hallinger, 2011; Leithwood & Jantzi, 2008). Significant correlations between educational leadership and student accomplishment in many situations are further supported by meta-analytic research (Karadag, 2020; Wu & Shen, 2022). Student learning and overall school success are directly impacted by teacher-related characteristics at the instructional level, such as professional development, job satisfaction, and instructional quality (Darling-Hammond, 2017; Hattie, 2009). According to Eryilmaz et al. (2025), international research also emphasizes the connections between leadership, working circumstances, and teacher job satisfaction, which is a crucial sign of organizational stability and retention. Furthermore, outcomes are significantly influenced by student characteristics and contextual factors including community involvement and school climate (Epstein, 2018; Organisation for Economic Co-operation and Development, 2020). Distributed leadership may have a direct or indirect impact on teacher satisfaction and efficacy, according to multilevel research (Sun & Xia, 2018).

Despite extensive research, a comprehensive understanding of the interrelated factors influencing school effectiveness remains limited, primarily because many studies rely on isolated or linear analytical approaches (Creswell & Creswell, 2018; Kline, 2016). While Structural Equation Modeling (SEM) offers a rigorous quantitative framework for analyzing intricate, multifaceted causal linkages, its application within secondary school settings remains notably scarce (Hair et al., 2018; Byrne, 2016). Consequently, constructing a validated causal structural model is essential for advancing evidence-based educational management and articulating the complex mechanisms underlying school performance. Furthermore, because the administrative, resource, and operational environments of schools within the Roi Et Educational Service Area exhibit unique regional characteristics, context-specific empirical models are vital for guiding strategic planning and targeted institutional improvements (Office of the Education Council, 2021; Ministry of Education, 2022).

To generate empirical knowledge that supports systematic educational management and sustainable quality development, it is imperative to investigate the complex causal mechanisms driving school performance. Aligning with the need to move beyond isolated, linear

evaluations, this study aims to: 1) assess the level of school effectiveness and its underlying determinants within the Roi Et Educational Service Area; 2) develop a comprehensive causal structural model emphasizing leadership and contextual determinants; and 3) rigorously validate the proposed model using empirical data. By mapping these intricate relationships through structural equation modeling, this research provides a strategic, evidence-based framework for policy formulation and secondary education improvement.

Literature Review

Concepts of School Effectiveness

School effectiveness is the extent to which a school fulfills the expectations of its stakeholders and achieves its intended goals through effective organizational functioning. Schools operate as social systems with linked structures, processes, and outcomes, claim Hoy & Miskel (2013). Therefore, effectiveness comprises more than just student achievement; it also includes administration quality, staff and parent satisfaction, and overall school performance. Classical organizational theory states that successful organizations achieve their goals, adapt to change, and maintain internal stability (Mott, 1972). Consequently, school success is viewed as a complex idea that is impacted by coordinated efforts from different stakeholders and subsystems (Cherrington, 1994; Hoy & Miskel, 2013).

Factors Affecting School Effectiveness

Determinants of secondary school effectiveness can be systematically categorized into four critical domains, heavily grounded in organizational research and educational administration: administrator leadership, school context, teacher attributes, and student characteristics. Rather than operating in isolation, these elements form a complex, interconnected organizational dynamic. Strategic educational leadership and supportive internal environments actively shape both the direct and indirect pathways to overall school outcomes. Consequently, understanding these interrelated leadership and contextual determinants is essential for constructing a robust structural model of school effectiveness.

1) Administrator factors: Setting objectives, distributing funds, and creating environments that promote teaching and learning are all crucial tasks for administrators. School effectiveness is frequently associated with managerial proficiency and leadership characteristics (Hoy & Miskel, 2013; Cherrington, 1994). Strong correlations between student accomplishment and principal leadership have been confirmed by meta-analyses (Karadag, 2020; Wu & Shen, 2022).

2) Teacher factors: Effective teaching and student learning are strongly influenced by teacher quality, professional growth, and job happiness. Teachers who get support and motivation are more likely to adopt successful teaching strategies and maintain their progress (McMillan & Schumacher, 2010). While broader perspectives emphasize the importance of ongoing professional development for maintaining good practice, research syntheses identify instructional quality as a major predictor of achievement outcomes (Hattie, 2009; Darling-Hammond, 2017). Additionally, multilevel data suggest mediated leadership effects, showing that distributed leadership influences teacher self-efficacy and work satisfaction (Sun & Xia, 2018). International research also supports the importance of job satisfaction in organizational functioning by linking it to teacher attributes and working conditions (Eryilmaz et al., 2025).

3) Student factors: Academic performance and educational success are closely linked to student learning behavior, attitudes toward learning, and family support. International assessment perspectives place a strong emphasis on the connections among student attributes, equity, and learning outcomes (Organization for Economic Co-operation and Development, 2023). The organizational circumstances of schools may also influence students' participation and learning dispositions, underscoring the necessity of considering student characteristics alongside leadership, instruction, and the school environment rather than in isolation.

4) School context factors: Organizational context, which includes organizational culture, learning environment, and administrative structure, also influences how effective schools are. These contextual factors can increase the enabling conditions for long-term progress and make it easier for school staff to collaborate. Organizationally speaking, context offers the practices, standards, and resources that influence conduct and output throughout the educational system (Hoy & Miskel, 2013; Cherrington, 1994).

Research Related to Causal Relationship Models and the Role of SEM

Although a substantial body of research examines school performance, the predominant reliance on linear or factor-based analyses often obscures the complex interactions and indirect impacts of leadership, teacher, student, and contextual variables (Hair et al., 2018). Structural Equation Modeling (SEM) provides a far more systematic and robust quantitative methodology for validating measurement models and computing the direct and indirect pathways among latent constructs (Byrne, 2016; Hair et al., 2018). Given the profound interconnectedness between educational leadership and contextual determinants, developing a context-specific causal-structural model to elucidate secondary school effectiveness is both theoretically justified and practically indispensable.

Research Conceptual Framework

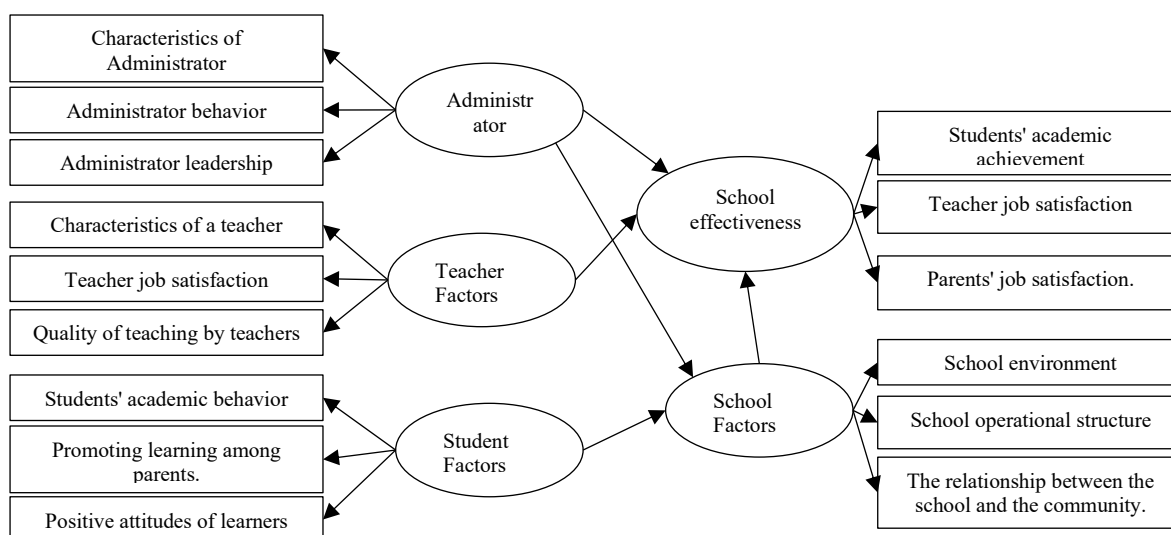


Figure 1 Research Conceptual Framework

Research Methodology

Research Design

This study employed a mixed-methods approach, with quantitative data acting as the primary component and qualitative evidence bolstering model creation and interpretation. The research was systematically divided into three stages: 1) assessing the level of school effectiveness and its underlying leadership and contextual determinants; 2) developing a comprehensive causal structural model; and 3) rigorously validating the proposed model using empirical data.

Population and Sample

The population consisted of 2,840 participants from schools under the control of the Secondary Educational Service Area Office Roi Et (161 school administrators and 2,680 instructors). The random sampling procedure involved multiple phases. Using Cochran's technique to determine the sample size at a 95% confidence level and a maximum 5% margin of error, 338 targeted respondents were recruited. 323 completed questionnaires were returned and analyzed, yielding a 95.56% response rate.

Data Collection and Analysis Procedures

Quantitative data were collected using a comprehensive five-point Likert scale questionnaire divided into three distinct sections: 1) respondent demographics, 2) perceived school effectiveness, and 3) the determinants influencing school effectiveness, specifically categorizing administrator and school variables as leadership and contextual determinants, alongside teacher and student factors. The instrument demonstrated excellent overall reliability, and field experts rigorously assessed its content validity. To support the structural model's design and ensure its practical applicability, supplementary qualitative data were gathered through focus groups and in-depth interviews with secondary school administration experts.

Following institutional ethical approval, quantitative questionnaires were systematically distributed and collected in accordance with the multi-stage sampling design, incorporating rigorous follow-ups to ensure high completion rates. Concurrently, qualitative data were gathered through semi-structured focus groups and expert interviews, which were carefully recorded for subsequent analysis. Quantitative data analysis commenced with descriptive statistics (means and standard deviations) to appropriately profile the sample. Subsequently, Confirmatory Factor Analysis (CFA) was rigorously conducted to verify measurement validity, followed immediately by Structural Equation Modeling (SEM) utilizing AMOS to examine the direct and indirect causal pathways and robustly evaluate the overall model fit against established statistical indices. Finally, the integrated qualitative findings were synthesized via content analysis to contextualize and substantially enrich the quantitative structural results.

Research Results

Results of the Study on the Effectiveness of Schools and the Factors Affecting School Effectiveness

Table 1 Mean and Standard Deviation of School Effectiveness

Components of School Effectiveness	$\bar{X}$	S.D.	Interpretation
Overall school quality	4.21	0.67	High
Teacher job satisfaction	4.12	0.67	High
Parent satisfaction	4.04	0.65	High
Student academic achievement	4.04	0.66	High
Overall	4.10	0.63	High

The Secondary Educational Service Area Office Roi Et schools were determined to have a good degree of overall school effectiveness ($\bar{X} = 4.10$, S.D. = 0.63). Overall school quality had the highest mean score across all components. This was followed by student academic achievement, parent happiness, teacher job satisfaction, and overall school quality (Table 1). Every aspect of school effectiveness received a rating of at least high according to the mean interpretation criteria.

Table 2 Mean and Standard Deviation of Factors Affecting School Effectiveness

Factors	$\bar{X}$	S.D.	Interpretation
Administrator factors	4.22	0.46	Highest
School factors	4.05	0.55	High
Teacher factors	4.02	0.42	High
Student factors	3.72	0.36	High

Analyzing the descriptive statistics across each domain, administrator factors—representing the core leadership determinants—recorded the highest mean score ($\bar{X} = 4.22$, S.D. = 0.46),

indicating the highest level of influence. This was closely followed by school factors ($\bar{X} = 4.05$, S.D. = 0.55), which encapsulate the contextual determinants, as well as teacher ($\bar{X} = 4.02$, S.D. = 0.42) and student factors ($\bar{X} = 3.72$, S.D.=0.36). These initial quantitative results strongly corroborate the study's theoretical premise, confirming that strategic leadership and the school's organizational context are the two primary determinants driving secondary school effectiveness within this specific educational region.

Results of the Causal Relationship Modeling of Factors Affecting School Effectiveness

The primary purpose of developing the causal structural model was to systematically investigate the complex relationships among the leadership and contextual determinants that drive overall school effectiveness. The proposed model comprised five latent structures: administrator factors (representing leadership determinants), teacher factors, student factors, school factors (representing contextual determinants), and school effectiveness. Confirmatory Factor Analysis (CFA) was utilized to validate the measurement model prior to structural testing. The results demonstrated that all investigated variables possessed statistically significant and respectable factor loadings, indicating that each indicator correctly reflected its associated latent component. These appropriate factor loadings strongly support the construct validity of the measurement model and validate the use of structural equation modeling (SEM) to examine the causal relationships among these constructs.

Table 3 Structure of Latent and Observed Variables in the Measurement Model

Latent Variables	Number of Observed Variables
Administrator factors	4
Teacher factors	4
Student factors	4
School factors	4
School effectiveness	4
Total	20

The measurement structure demonstrates conceptual balance among the concepts because there are an equal number of indicators for each latent variable. This symmetrical shape enhances model stability and encourages accurate estimation in the context of SEM.

Confirmation of the Causal Relationship Model of Factors Affecting School Effectiveness

The researcher examined the consistency of the causal relationship model of factors affecting school effectiveness within the Roi Et Secondary Educational Service Area Office using empirical data and the AMOS program. The results of the statistical analysis measuring the model's consistency with empirical data are shown in Table 4.

Table 4 Goodness-of-Fit Indices for the Causal Structural Model

Fit Index	Acceptance Criteria	Obtained Value	Evaluation
1) Chi-square (χ^2)	p-value > .05	$\chi^2 = 448.741$, p = .000	Not acceptable
2) Relative Chi-square (χ^2/df)	< 3.00	2.933	Acceptable
3) Goodness of Fit Index (GFI)	> 0.90	0.893	Not acceptable
4) Comparative Fit Index (CFI)	> 0.90	0.968	Acceptable
5) Tucker-Lewis Index (TLI)	> 0.90	0.960	Acceptable
6) Root Mean Square Error of Approximation (RMSEA)	< 0.08	0.077	Acceptable
7) Root Mean Square Residual (RMR)	< 0.08	0.016	Acceptable

Table 4 presents the results of the statistical analysis assessing the model's fit to the empirical data. The chi-square value was 448.741 with 153 degrees of freedom (df), which was statistically significant (p-value = 0.000) but did not meet the required criterion (p-value > 0.05). However, in social science and education research, the chi-square has a significant limitation: it is sensitive to sample size (Hair et al., 2018). When the sample size is large (more than 200 people), the chi-square statistic can easily become statistically significant, even if the model fits the data well. Therefore, it is necessary to consider other statistical measures.

Regarding the model's overall goodness of fit, the relative chi-square value (χ^2/df) was 2.933, satisfying Kline's (2016) established criterion of being strictly less than 3.00. While the Goodness of Fit Index (GFI) was 0.893—falling slightly below the stringent 0.90 threshold—it remains highly acceptable according to Browne and Cudeck (1993). Moreover, both the Comparative Fit Index (CFI) and the Tucker-Lewis Index (TLI) reached impressive values of 0.968 and 0.960, respectively, securely exceeding the 0.95 benchmark indicating an excellent fit (Hu & Bentler, 1999). Additionally, the Root Mean Square Error of Approximation (RMSEA) was calculated at 0.077, and the Root Mean Square Residual (RMR) at 0.016, with both metrics falling well below the critical 0.08 threshold (MacCallum et al., 1996). Consequently, as Schermelleh-Engel et al. (2003) and Brown (2015) emphatically recommend, the simultaneous evaluation of these robust indices—particularly the CFI, TLI, and RMSEA—confirms that the proposed causal structural model provides a highly satisfactory and scientifically valid fit to the empirical data.

The criteria are at the good-to-very-good level.

Table 5 Construct Reliability (CR) and Average Variance Extracted (AVE)

Latent Variable	Construct Reliability (CR)	Average Variance Extracted (AVE)	$\sqrt{\text{AVE}}$
Administrator Factors (AD)	0.936	0.786	0.887
Teacher Factors (TE)	0.936	0.787	0.887
Student Factors (ST)	0.934	0.785	0.886
School Factors (SC)	0.969	0.889	0.943
School Effectiveness (EF)	0.960	0.856	0.925

Table 6 Correlations among Latent Variables and the Square Root of AVE

Latent Variable	AD	TE	ST	SC	EF
Administrator Factors (AD)	0.887				
Teacher Factors (TE)	0.517	0.887			
Student Factors (ST)	0.432	0.428	0.886		
School Factors (SC)	0.722	0.716	0.628	0.943	
School Effectiveness (EF)	0.720*	0.687*	0.710*	0.745*	0.925

Note: 1) The bold values on the diagonal represent the square root of the Average Variance Extracted ($\sqrt{\text{AVE}}$). 2) The correlation values involving school effectiveness (EF) are estimated based on the available data, as direct correlation values were not provided. 3) All correlation coefficients are statistically significant at the .01 level ($p < .01$).

From the table above, it can be concluded that the overall measurement model has an acceptable fit to the empirical data. All observed variables can significantly measure the latent variables, have component reliability coefficients (CRs) greater than 0.90, and the extracted mean variance (AVE) is significantly greater than 0.50. Furthermore, the $\sqrt{\text{AVE}}$ value of all latent variables is higher than the correlation coefficient between each pair of latent variables, indicating that the measurement model possesses both congruence and discriminatory validity. Therefore, this measurement model can be used in subsequent structural equation modeling.

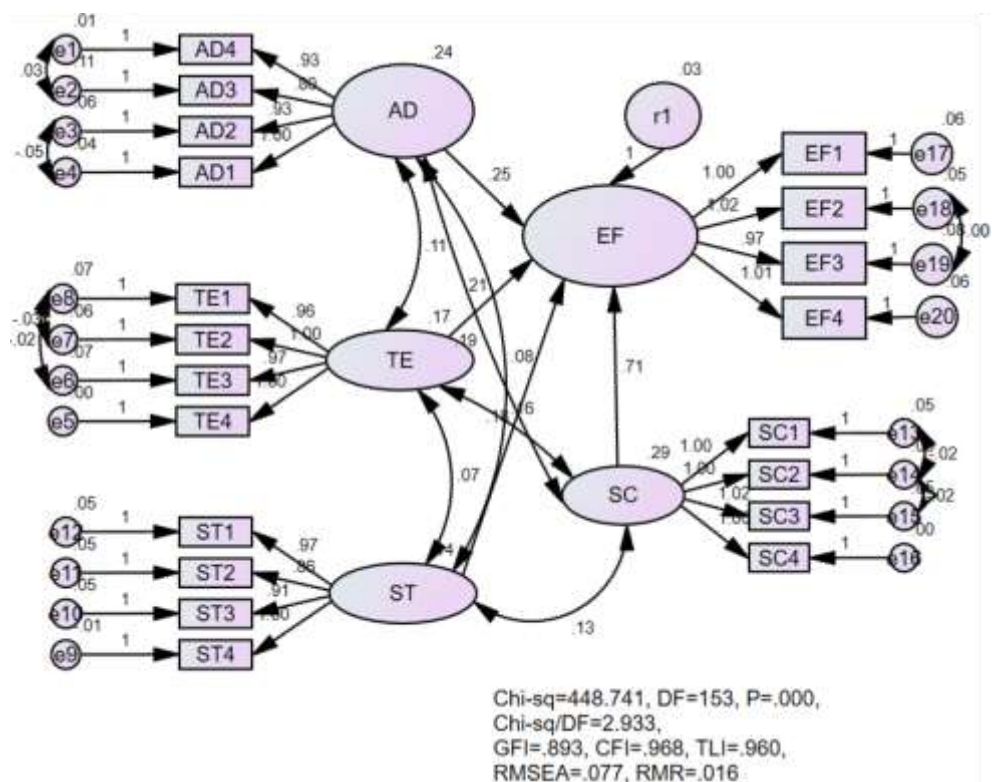


Figure 2 Validated Causal Structural Model of Secondary School Effectiveness

Figure 2 shows the results of the causal relationship analysis of factors affecting the effectiveness of schools under the Roi Et Secondary Educational Service Area Office. The model consists of 5 latent variables: Administrator factors (AD), Teacher factors (TE), Student factors (ST), School factors (SC), and School effectiveness (EF). Each latent variable has 4 observable variables, for a total of 20 variables.

The analysis results show that the component weights for all observable variables are statistically significant at the 0.01 level and positive, indicating that these variables can be used to measure the latent variables appropriately. The details are as follows: 1) Administrator factors (AD) have 4 observable variables. The variable with the highest factor weight is AD4 (Administrators' management skills), with a factor weight of 0.93. This is followed by AD3 (Administrators' leadership), with a factor weight of 0.88.) Teacher factors (TE) have 4 observable variables. The variable with the highest factor weight is TE2 (Teachers' job satisfaction), with a factor weight of 0.96. This is followed by TE1 (Teachers' attributes), with a factor weight of 0.87. 3) Student factors (ST) have 4 observable variables. The variable with the highest factor weight is ST4 (Students' commitment to learning), with a factor weight of 0.97. This is followed by ST3 (Students' positive attitudes), with a factor weight of 0.96. 4) School factors (SC) have 4 observable variables. The variable with the highest factor weight is SC4 (School organizational culture), with a factor weight of 1.00. This is followed by SC3 (School-community relationship). 5) School Effectiveness (EF) has 4 observable variables. The variable with the highest factor weight is EF4 (Overall School Quality), with a factor weight of 1.01. This is followed by EF2 (Teacher Job Satisfaction), with a factor weight of 1.00.

Conclusion and Discussion

This study systematically evaluated the core dimensions of secondary school effectiveness, thoroughly examined their underlying determinants, and successfully validated a causal structural model tailored to schools within the Roi Et Educational Service Area. Overall, the empirical findings provide robust support for a systems perspective on educational

management. This perspective asserts that leadership and contextual determinants fundamentally shape the organizational environment, which in turn influences teachers' instructional processes and student engagement, ultimately dictating comprehensive school outcomes.

First, the results demonstrated that overall school performance was high, suggesting that schools in this context generally have high organizational quality and instructional management. This is in line with classic organizational perspectives, which suggest that the achievement of core objectives, responsiveness to stakeholder expectations, and stability in organizational functioning are all signs of effectiveness (Mott, 1972; Hoy & Miskel, 2013). Research indicates that staff attitudes and organizational performance are substantially connected to working conditions and school atmosphere (Eryilmaz et al., 2025), underscoring the importance of teacher job satisfaction and perceived school quality as essential elements. These findings emphasize how important it is for educational administrators to view performance as complex and not solely dependent on student achievement (Hoy & Miskel, 2013; Bush, 2011).

Second, the causal model empirically indicated that administrator factors—acting as the primary leadership determinants—were the most potent predictors of school effectiveness. This finding is highly consistent with educational leadership theory, which highlights the crucial functions of leaders in setting objectives, allocating resources, and preserving harmonious school systems (Cherrington, 1994; Hoy & Miskel, 2013). It is further supported by extensive meta-analytic research demonstrating strong relationships between principal leadership and educational outcomes (Karadag, 2020; Wu & Shen, 2022). Practically, this indicates that strategic leadership operates through multiple internal mechanisms, such as fostering professional development and establishing a supportive learning environment, which directly and indirectly drive organizational effectiveness.

Third, school-related characteristics exerted the second-strongest effect, clearly highlighting the critical role that organizational systems, culture, and community relationships play as foundational contextual determinants. This aligns perfectly with organizational theories emphasizing that supportive contextual environments are essential for facilitating long-term institutional performance (McMillan & Schumacher, 2010). Previous studies confirm that a positive school climate is associated with improved academic performance and reduced achievement gaps (Berkowitz et al., 2017; MacNeil et al., 2009). Therefore, enhancing collaborative standards and administrative structures cultivates a conducive environment for instruction, which is vital for sustained advancement in secondary education.

Fourth, while teacher and student factors contributed significantly to overall school effectiveness, their aggregate impact was comparatively less than that of the primary leadership and contextual determinants. This hierarchical pattern corroborates previous research, demonstrating that leadership and school-wide contextual systems create the essential foundational conditions that either support or constrain teacher collaboration, instructional quality, and student learning behaviors (Shen et al., 2020; Lomos et al., 2011; Organisation for Economic Co-operation and Development, 2023). Furthermore, multilevel SEM findings reinforce this integrated interpretation, confirming that strategic administrative leadership and robust contextual policies indirectly enhance teacher efficacy and job satisfaction through well-established mediated pathways (Sun & Xia, 2018; Maxwell et al., 2017).

Ultimately, the causal structural model demonstrated a robust fit with the empirical data, comprehensively explaining a substantial 89% of the variance in school effectiveness. This finding provides strong methodological support for utilizing SEM to capture the complex, non-linear organizational dynamics of educational environments. The model explicitly confirms that strategic educational leadership and supportive internal school systems are the paramount contextual determinants of secondary school efficacy. Therefore, to achieve sustainable quality

improvements, policymakers and educational managers must prioritize leadership capacity and organizational culture as an integrated system, moving away from isolated or fragmented reform initiatives.

Based on the research findings and discussion, two main recommendations can be presented: recommendations for application and recommendations for future research, as follows:

1) Recommendations for Application: Because leadership determinants exert the most profound impact on school effectiveness, educational oversight agencies must prioritize the cultivation of school administrators' strategic leadership, administrative acumen, and change-management capabilities. Concurrently, to foster robust staff collaboration and instructional excellence, schools must systematically enhance their contextual determinants, specifically by optimizing organizational culture, working conditions, and internal administrative processes. While teacher and student factors demonstrated a comparatively smaller direct impact, sustaining continuous professional development and robust support systems for student learning remains essential. Ultimately, this validated causal structural model serves as an empirical foundation for designing highly targeted, context-appropriate educational policies and strategic improvement plans.

2) Future research Recommendations: To enhance the generalizability of these findings, future studies should expand their scope to include secondary schools across diverse educational service areas and regions. The proposed causal structural model should be rigorously replicated with different samples or validated using longitudinal data to confirm its predictive accuracy and long-term stability. Furthermore, incorporating a broader spectrum of contextual determinants—such as digital technology integration, shifting educational policies, and deeper community involvement—would yield an even more comprehensive understanding of the complex mechanisms driving sustainable school effectiveness.

References

- Berkowitz, R., Moore, H., Astor, R., & Benbenishty, R. (2017). A research synthesis of the associations between socioeconomic background, inequality, school climate, and academic achievement. *Review of Educational Research*, 87(2), 425-469.
- Brown, T. (2015). *Confirmatory factor analysis for applied research* (2nd ed.). New York: The Guilford Press.
- Browne, M., & Cudeck, R. (1993). Alternative ways of assessing model fit. In K. Bollen & J. Long (eds.). *Testing structural equation models* (pp. 136-162). California: SAGE Publications.
- Bush, T. (2011). *Theories of educational leadership and management* (4th ed.). London: SAGE Publications.
- Byrne, B. (2016). *Structural equation modeling with AMOS: Basic concepts, applications, and programming* (3rd ed.). New York: Routledge.
- Cheng, Y. (1996). *School effectiveness and school-based management: A mechanism for development*. London: Routledge.
- Cherrington, D. (1994). *Organizational behavior: The management of individual and organizational performance*. Massachusetts: Allyn & Bacon.
- Creswell, J., & Creswell, J. (2018). *Research design: Qualitative, quantitative, and mixed methods approaches* (5th ed.). California: SAGE Publications.
- Darling-Hammond, L. (2017). Teaching for social justice: Resources, relationships, and anti-racist practice. *Multicultural Perspectives*, 19(3), 133-138.
- Epstein, J. (2018). *School, Family, and Community Partnerships: Preparing Educators and Improving Schools*. London: Routledge.

- Eryilmaz, N., Kennedy, A., Strietholt, R., & Johansson, S. (2025). Teacher job satisfaction: International evidence on the role of school working conditions and teacher characteristics. *Studies in Educational Evaluation*, 86, 101474.
- Fullan, M. (2016). *The new meaning of educational change* (5th ed.). New York: Teachers College Press.
- Hair, J., Black, W., Babin, B., & Anderson, R. (2018). *Multivariate data analysis* (8th ed.). London: Cengage Learning.
- Hallinger, P. (2011). Leadership for learning: Lessons from 40 years of empirical research. *Journal of Educational Administration*, 49(2), 125-142.
- Hattie, J. (2009). *Visible learning: A synthesis of over 800 meta-analyses relating to achievement*. New York: Routledge.
- Hoy, W., & Miskel, C. (2013). *Educational administration: Theory, research, and practice* (9th ed.). New York: McGraw-Hill.
- Hu, L., & Bentler, P. (1999). Cutoff criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling: A Multidisciplinary Journal*, 6(1), 1-55.
- Karadag, E. (2020). The effect of educational leadership on students' achievement: A cross-cultural meta-analysis research on studies between 2008 and 2018. *Asia Pacific Education Review*, 21, 49-64.
- Kline, R. (2016). *Principles and practice of structural equation modeling* (4th ed.). New York: The Guilford Press.
- Leithwood, K., & Jantzi, D. (2008). Linking leadership to student learning: The contributions of leader efficacy. *Educational Administration Quarterly*, 44(4), 496-528.
- Leithwood, K., Harris, A., & Hopkins, D. (2020). Seven strong claims about successful school leadership revisited. *School Leadership & Management*, 40(1), 5-22.
- Lomos, C., Hofman, R., & Bosker, R. (2011). Professional communities and student achievement – a meta-analysis. *School Effectiveness and School Improvement*, 22(2), 121-148.
- MacCallum, R., Browne, M., & Sugawara, H. (1996). Power analysis and determination of sample size for covariance structure modeling. *Psychological Methods*, 1(2), 130-149.
- MacNeil, A., Prater, D., & Busch, S. (2009). The effects of school culture and climate on student achievement. *International Journal of Leadership in Education*, 12(1), 73-84.
- Maxwell, S., Reynolds, K., Lee, E., Subasic, E., & Bromhead, D. (2017). The impact of school climate and school identification on academic achievement: Multilevel modeling with student and teacher data. *Frontiers in Psychology*, 8, 2069.
- McMillan, J., & Schumacher, S. (2010). *Research in Education: Evidence-Based Inquiry*. New Jersey: Pearson Education, Inc.
- Ministry of Education. (2022). *Educational Action Plan*. Bangkok: Ministry of Education.
- Mott, P. (1972). *The characteristics of effective organizations*. New York: Harper & Row.
- Office of the Basic Education Commission. (2022). *Basic Education Development Plan 2023-2027*. Bangkok: Ministry of Education.
- Office of the Education Council. (2021). *Report on the status of Thai education*. Bangkok: Ministry of Education.
- Organisation for Economic Co-operation and Development. (2020). *Education at a glance 2020: OECD indicators*. Retrieved from www.oecd.org/content/dam/oecd/en/publications/reports/2020/09/education-at-a-glance-2020_19b01e87/69096873-en.pdf.
- Organisation for Economic Co-operation and Development. (2023). *PISA 2022 results (Volume I): The state of learning and equity in education*. Retrieved from www.oecd.org/content/dam/oecd/en/publications/reports/2023/12/pisa-2022-results-volume-i_76772a36/53f23881-en.pdf.

- Owens, R., & Valesky, T. (2014). *Organizational behavior in education: Leadership and school reform* (10th ed.). London: Pearson Education.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23-74.
- Schleicher, A. (2019). *PISA 2018: Insights and interpretations*. Retrieved from [www.oecd.org/content/dam/oecd/en/about/programmes/edu/pisa/publications/national-reports/pisa-2018/PISA 2018 Insights and Interpretations FINAL PDF.pdf](http://www.oecd.org/content/dam/oecd/en/about/programmes/edu/pisa/publications/national-reports/pisa-2018/PISA%202018%20Insights%20and%20Interpretations%20FINAL%20PDF.pdf).
- Shen, J., Wu, H., Reeves, P., Zheng, Y., Ryan, L., & Anderson, D. (2020). The association between teacher leadership and student achievement: A meta-analysis. *Educational Research Review*, 31, 100357.
- Sun, A., & Xia, J. (2018). Teacher-perceived distributed leadership, teacher self-efficacy and job satisfaction: A multilevel SEM approach using the 2013 TALIS data. *International Journal of Educational Research*, 92, 86-97.
- United Nations Educational, Scientific, and Cultural Organization. (2021). *Reimagining our futures together: A new social contract for education*. Retrieved from <https://unesdoc.unesco.org/ark:/48223/pf0000379707>.
- World Bank. (2020). *World Development Report 2020: Trading for Development in the Age of Global Value Chains*. Washington, D.C.: World Bank.
- Wu, H., & Shen, J. (2022). The association between principal leadership and student achievement: A multivariate meta-meta-analysis. *Educational Research Review*, 35, 100423.

Data Availability Statement: The raw data supporting the conclusions of this article will be made available by the authors, without undue reservation.

Conflicts of Interest: The authors declare that the research was conducted without any commercial or financial relationships that could be construed as conflicts of interest.

Publisher's Note: All claims expressed in this article are solely those of the authors and do not necessarily represent those of their affiliated organizations or of the publisher, editors, and reviewers. Any product evaluated in this article, or any claim its manufacturer may make, is not guaranteed or endorsed by the publisher.



Copyright: © 2026 by the authors. This is a fully open-access article distributed under the terms of the Attribution-NonCommercial-NoDerivatives 4.0 International (CC BY-NC-ND 4.0).