School leadership and student learning: a second-order meta-analysis of domains, dimensions, and practices

by

Heath Peine

B.S., Pittsburg State University, 1999
M.S., Pittsburg State University, 2001
M.S., Emporia State University, 2006

AN ABSTRACT OF A DISSERTATION

submitted in partial fulfillment of the requirements for the degree

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Department of Educational Leadership
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KANSAS STATE UNIVERSITY
Manhattan, Kansas

2026

Abstract

Educational leadership research offers substantial evidence about relationships with student learning, but differences in how leadership is defined and organized make that evidence difficult to consolidate and apply. Drawing on 17 meta-analyses (2001–2026), this second-order synthesis compared relationships between K–12 leadership work and student outcomes at different levels of specificity, with academic achievement as the principal focus. Preserving the original authors' terminology and construct meanings, the study organized comparable leadership work into 15 dimensions within seven broader domains and examined specific practices separately. Reported associations were expressed as Cohen's *d* and combined where appropriate, giving greater weight to estimates based on more contributing primary studies. All 15 dimension estimates were positive (d = 0.14–0.57). The largest observed associations involved evidence-informed decision making (0.57), resource alignment (0.48), culture and professional community (0.44), professional learning and capacity building (0.43), and establishing shared purpose and direction (0.43). The smallest observed associations involved organizational management and operations (0.23) and instructional monitoring, assessment, and feedback (0.14). Domain estimates ranged from 0.30 to 0.57. Four recurring practices yielded combined estimates, led by setting and sustaining school goals (0.48); 25 additional practice findings were reported individually. Findings concerning school level, school setting, and geography were mixed and did not establish a consistent pattern across leadership dimensions. The proposed model links shared purpose, expertise, collective responsibility, and aligned action around student learning. This synthesis brings greater coherence to accumulated leadership evidence, offering a clearer basis for focusing attention, developing expertise, and aligning resources for school improvement.

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Approved by:

Major Professor
Dr. Donna Augustine-Shaw

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Dedication

To my wife, Casey, and our sons, Abram, Gideon, and Roman.

This dissertation represents years of learning, persistence, and personal growth, but the greatest part of my journey has been sharing those years with you. Through the demands of work, travel, and continued education, you have given me love, patience, encouragement, and perspective.

My hope is that this accomplishment serves as a reminder that learning is a lifelong pursuit, that meaningful goals require perseverance, and that it is never too late to challenge yourself or pursue something important.

Above all, I want you to know that no degree, professional achievement, or personal accomplishment could ever mean more to me than the life we share together.

With all my love, I dedicate this work to you.

Chapter 1 - Overview

Introduction

Educational leadership has been associated with student learning and school improvement across a substantial body of research (Hitt & Tucker, 2016; Robinson et al., 2008; Witziers et al., 2003). Researchers have examined leadership through different models, frameworks, constructs, and practices, producing a diverse literature on how leadership relates to student learning.

Background of the Problem

School leaders are expected to guide instructional improvement, support professional learning, develop collaborative cultures, manage organizational conditions, and respond to evidence about student learning (Hallinger, 2011; Leithwood et al., 2010). Research addresses this range of responsibilities through different conceptions of leadership work.

The volume and diversity of this research make it difficult to summarize directly. First-order meta-analyses have helped synthesize findings from primary studies within portions of the literature. Those meta-analyses, however, differ in the leadership constructs they examine, how those constructs are organized, the student outcomes included, and the methods used to estimate relationships. Consequently, findings across meta-analyses are not always directly comparable.

A second-order meta-analysis provides a way to examine this accumulated evidence together. It compares and synthesizes findings from existing meta-analyses while retaining important differences in how leadership has been conceptualized and studied.

Statement of the Problem

Individual meta-analyses provide useful syntheses, but differences in leadership constructs, terminology, organization, outcomes, and analytic approaches make it difficult to

compare the accumulated evidence and determine which areas of leadership work are most consistently associated with student outcomes. This study addresses that problem through a second-order meta-analysis that provides a common basis for comparison while preserving what each source reports.

Research Purpose

The purpose of this study is to conduct a second-order meta-analysis of the educational leadership meta-analytic literature to support meaningful comparison of leadership constructs and their relationships with student outcomes, with academic achievement as the principal focus. The study first records the constructs reported by each meta-analysis and what those constructs mean, then applies the dissertation's classifications to compare sufficiently similar leadership work. These classifications do not replace the original authors' terminology or conceptual organization.

The study examines this evidence at three levels of specificity. Practices describe specific ways leadership is carried out; dimensions describe coherent areas of leadership work that may include several related actions; and domains group related dimensions into broader areas of responsibility. The 15 researcher-defined dimensions used to compare sufficiently similar leadership work across meta-analyses are referred to as synthesized dimensions in the research questions and codebook. The analyses examine relative weighted magnitude at the dimension and higher-order domain levels and report practice-level evidence where sufficiently comparable.

Research Questions

This study is guided by the following five research questions:

RQ1. How can leadership constructs reported in existing meta-analyses be systematically classified and organized into higher-order domains, synthesized dimensions, and practices to support meaningful cross-meta-analytic comparison?

RQ2. What is the relative weighted magnitude of the synthesized relationships between leadership dimensions and student outcomes across existing meta-analyses?

RQ3. What is the relative weighted magnitude of the synthesized relationships between higher-order leadership domains and student outcomes across existing meta-analyses?

RQ4. What practice-level relationships with student outcomes can be identified across existing meta-analyses and, where sufficiently comparable evidence is available, what is their relative weighted magnitude?

RQ5. To what extent does the meta-analytic literature provide evidence that contextual factors may moderate the relationships between leadership dimensions and student outcomes?

Conceptual Framework

Leadership research has developed through models and frameworks that organize leadership in different ways. These remain important for understanding the field (Gumus et al., 2018; Hallinger, 2003; Leithwood, 2012), but broad model labels alone do not provide a sufficiently clear basis for comparing recurring leadership work across meta-analyses (Hitt & Tucker, 2016; Leithwood & Jantzi, 2005).

Within the hierarchy introduced above, dimensions provide the primary comparison level for RQ2. They support examination of recurring leadership work, such as setting direction, developing people, supporting instruction, and shaping organizational conditions, even when it appears within different models or frameworks (Hitt & Tucker, 2016; Leithwood & Sun, 2012). Higher-order domains provide the broader grouping examined under RQ3, while practices

provide the more specific view examined under RQ4. Not every construct is assigned at every level, and separate practice reporting does not independently corroborate a dimension finding based on the same evidence.

This framework assumes that sufficiently similar leadership work can be compared across meta-analyses despite differences in terminology and organization (Hitt & Tucker, 2016; Tan et al., 2022). The aim is to clarify patterns in the findings while retaining the meanings used by the original authors.

This framework connects the leadership literature to the second-order meta-analytic design (Schmidt & Oh, 2013; Tan et al., 2022). Contextual evidence is examined separately under RQ5; it is not another level in the hierarchy.

Research Design

This study used a second-order meta-analysis. Existing meta-analyses served as the study-level sources, and the study compared and synthesized findings already reported in those sources rather than collecting new primary data.

Comparative classification provided a consistent structure for examining sufficiently similar leadership constructs across meta-analyses, even when authors named or organized them differently. The study preserved each source's terminology, conceptual organization, and reported findings before applying its classifications.

Significance of the Study

The study’s comparisons of leadership evidence and contextual findings have implications for research, practice, and policy (Schmidt & Oh, 2013; Tan et al., 2022).

Significance for Research

For researchers, the study identifies where observed relationships with student outcomes are comparatively larger or smaller, how broadly different areas of leadership work are represented across meta-analyses, and where evidence remains limited or uneven.

The study also provides a documented basis for comparison through structured extraction, preservation of source information, coding categories and decision rules, pilot coding, and documentation of decisions (Cooper, 2017; Schmidt & Oh, 2013). This addresses the challenge of comparing similar leadership work that authors organize and label differently (Hitt & Tucker, 2016; Tan et al., 2022).

Significance for Practice

For practitioners, the study identifies areas of leadership work associated with student outcomes across meta-analyses, helping leaders consider how to prioritize their time, attention, and resources. Broad approaches such as instructional, transformational, and distributed leadership have shaped the field but do not always provide clear day-to-day guidance (Gumus et al., 2018; Hitt & Tucker, 2016). Findings about more specific leadership work can inform professional learning, coaching, and evaluation systems that require concrete descriptions of effective leadership (Grissom et al., 2021). Distinct from the study's seven-domain and 15-dimension analytical organization, a researcher-proposed model connects shared purpose, professional expertise, culture and collective responsibility, and aligned instructional and organizational action around student learning, with evidence-informed diagnosis and evaluation throughout.

Significance for Policy

For policymakers and educational system leaders, the study provides a more differentiated evidence base for decisions about leadership priorities, professional development, and organizational support for school improvement. Policy expectations that leaders use evidence make this interpretation particularly important (U.S. Department of Education, 2016). Comparisons of weighted relationships at the dimension and higher-order domain levels can help systems examine how their expectations, resources, and supports align with learning priorities (Tan et al., 2022).

Operational Definitions

Because the educational leadership literature uses terminology inconsistently, the following definitions clarify how key terms are used in this study. These definitions are applied for purposes of analysis and comparison and do not replace the meanings assigned by original authors in the source literature.

Table 1.1

Leadership Terminology Used in This Study

Term	Meaning in this study	Question	Example
Broad approach/model	An overarching way leadership is conceptualized or organized in the literature. Authors may describe these as styles, models, frameworks, approaches, or theories; the dissertation preserves the terminology used by the original source. Authors also sometimes use the term leadership style for broad constructs narrower than an overarching model.	What broad conception of leadership is being examined?	Instructional, transformational, or distributed leadership.
Domain	A broad area of leadership responsibility that groups related dimensions.	What major area of responsibility is being addressed?	Lead Teaching and Learning.

Term	Meaning in this study	Question	Example
Dimension	A coherent area of leadership work organized around a common function or purpose. A dimension is more specific than a domain and may encompass several related practices, actions, or indicators.	Which area of that responsibility is being examined?	Instructional Monitoring, Assessment, and Feedback.
Practice	A more specific way leadership is carried out within an area of leadership work, typically through an activity, routine, or closely related set of activities.	What do leaders do within this area?	Reviewing evidence of student learning with teachers and determining instructional responses.

Note. Domains, dimensions, and practices move from broad responsibilities to more specific leadership work; they do not describe a causal sequence. Broad leadership models are not another level in this hierarchy. Original authors may use different terms or organize leadership differently. Their terminology and organization are preserved before the dissertation's classifications are applied.

The researcher compared the meaning of leadership constructs reported across the meta-analyses and grouped sufficiently similar constructs into 15 dimensions developed and named for this study. These dimensions were organized within seven broader domains, also defined by the researcher. RQ1 and the codebook refer to these researcher-defined groups as synthesized dimensions; they are the dimension level shown in Table 1.1, not a separate level. The original authors' terminology and organization were retained separately.

Second-Order Meta-Analysis

A first-order meta-analysis synthesizes findings from primary studies, often by combining effect sizes (Glass et al., 1981). A second-order meta-analysis synthesizes findings from existing meta-analyses that examine similar relationships or outcomes (Schmidt & Oh, 2013). Each included meta-analysis is a study-level source in this dissertation. In this study,

pooling means combining sufficiently comparable results from different meta-analyses into one weighted average, or pooled estimate. Results based on more contributing primary studies receive greater weight; practice findings that cannot be combined appropriately are reported individually.

Student Outcomes

Student outcomes are the student-level results examined in relation to leadership, with academic achievement as the principal focus of this study.

Assumptions

This study is based on several assumptions. First, it is assumed that existing meta-analyses provide sufficient quantitative and descriptive information to support second-order comparison and synthesis. Second, it is assumed that recurring leadership work can be meaningfully compared across meta-analyses, even when authors use different terminology or organize constructs differently. This assumption supports the use of comparative coding to align similar areas of leadership work across studies. Third, it is assumed that student outcomes reported across meta-analyses are sufficiently comparable to interpret within a broader category of student performance, even when specific indicators differ across studies. Fourth, it is assumed that reported effect sizes, even when presented using different metrics, can be interpreted consistently and, where appropriate, compared across studies. Finally, it is assumed that clearly reported practice-level findings support examination of more specific leadership work under RQ4, with practice estimates combined only when sufficiently comparable evidence recurs across meta-analyses.

Delimitations

The researcher established the following boundaries to define the study. First, the study includes existing meta-analyses rather than primary empirical studies. Narrative reviews and conceptual papers are excluded unless they also report meta-analytic findings.

Second, the study is limited to leadership research conducted in K–12 educational settings or equivalent school contexts. Research focused exclusively on higher education, early childhood-only settings, or non-school organizational contexts falls outside the dissertation's scope.

Third, the study focuses specifically on leadership in relation to student outcomes. Studies focused only on teacher, organizational, or implementation outcomes fall outside the primary scope of the analysis unless they also report student outcomes separately.

Fourth, the study is limited to meta-analyses published from 2000 through 2026. This boundary focuses the review on the contemporary meta-analytic literature in educational leadership; underlying primary studies could predate this period.

Finally, quantitative comparison is organized around dimensions for RQ2, higher-order domains for RQ3, and practice-level findings for RQ4. Evidence contributes across these connected levels only where conceptual assignment and quantitative representation are defensible; recurring practice estimates are combined only where sufficiently comparable evidence is available.

Chapter Summary

Differences among meta-analyses make it difficult to compare the accumulated evidence on leadership and student outcomes. This study uses a second-order meta-analysis to support that comparison through dimensions, broader domains, and more specific practices, with contextual

evidence examined separately. Chapter 2 reviews the leadership models, frameworks, and empirical literature that provide the conceptual and empirical basis for these comparisons.

Chapter 2 - Literature Review

This chapter reviews the literature on educational leadership, focusing on how leadership has been conceptualized, measured, and linked to student outcomes. The chapter examines major leadership frameworks, alternative models, and the dimensions and practices through which researchers have studied leadership. It highlights the increasing complexity of the role of an educational leader over time and the emergence of a focus on evidence-based practices. The later sections bring these perspectives together around recurring areas of leadership work and consider variation across school contexts. This review lays the groundwork for a second-order meta-analysis of leadership and student outcomes.

Numerical effect-size comparisons in this literature review are presented on the Cohen's *d* scale for consistency with the dissertation's second-order quantitative synthesis. Where original sources reported correlations (*r*), estimates were converted using $d = \frac{2r}{\sqrt{1-r^2}}$ (Borenstein et al., 2009). Where standardized estimates were already available on the dissertation's adopted reporting scale, the original numerical values were retained rather than reconstructed from rounded correlations. Original source-reported metrics and values were preserved separately from researcher-derived conversions. Presenting estimates on a common scale does not establish equivalence among the underlying leadership constructs, student outcomes, or research designs.

The Purpose and Challenges of Educational Organizations

A primary purpose of K–12 educational organizations is to equip students with the knowledge, skills, and dispositions necessary to succeed in postsecondary education and society. To achieve this purpose, schools must overcome many challenges, including clearly defining the success they hope to achieve and implementing the policies and practices needed to meet those aspirations. The Organisation for Economic Co-operation and Development (OECD, 2019)

situated these responsibilities within changing social, technological, and economic circumstances.

Changes in society, technology, and policy require educational institutions to adapt as they equip students for current needs (OECD, 2019). Meeting these challenges involves support for instructional improvement and attention to contextual needs (Darling-Hammond, 2010; Leithwood et al., 2008). Disparities in resources, differences in student needs, parental pressure, and pressure to demonstrate outcomes combine to place significant demands on schools and their leaders. School leaders play an influential role in navigating these challenges by establishing a culture of high expectations, fostering instructional improvement, and implementing strategies that prioritize student achievement (Robinson et al., 2008).

Effective school leadership builds trust, develops a shared purpose, and creates collaborative structures that support organizational improvement (Hallinger, 2011; Leithwood & Jantzi, 2000). School leaders influence more than teacher practices; researchers have also examined their relationships with school culture, staff commitment, and conditions for student learning (Grissom et al., 2021; Leithwood & Sun, 2012). These responsibilities provide a reason to consider leadership broadly while examining particular areas of leadership work.

Federal Mandates and the Evolution of Evidence-Based Leadership Practices

Federal policy has also increased attention to the evidence used in educational decisions. The Individuals with Disabilities Education Improvement Act (2004) and the Every Student Succeeds Act (2015) formed part of the policy context in which schools were expected to justify educational provision and improvement efforts. The U.S. Department of Education's (2016) guidance on using evidence emphasized identifying needs, selecting relevant interventions, planning and supporting implementation, and examining outcomes. The implication for

leadership is not simply to adopt a program labeled effective, but to consider the relevance and quality of the evidence informing a decision.

Contemporary Complexity and the Expanding Role of School Leadership

Beyond policy expectations for evidence-based practice, educational leaders' roles have expanded in both scope and responsibility. Leaders are expected to move beyond traditional administrative responsibilities to include driving instructional improvement, supporting teacher development, engaging with parents and families, cultivating positive and collaborative school environments, and keeping abreast of evidence and research findings and their implications for practice (Grissom et al., 2021; Leithwood et al., 2010; Leithwood et al., 2020; Louis et al., 2010). Work on culturally responsive leadership has also emphasized the importance of understanding students' communities and examining practices that reproduce inequitable opportunities (Khalifa et al., 2016).

Effective educational leaders must balance competing demands, adapt to diverse contexts, and respond to new challenges as they arise, while staying informed by research evidence. Hattie (2023) argued that high-impact leaders share several common attributes, including developing a shared narrative focused on impact, promoting high expectations, providing supportive structures, leading the collective effectively, and knowing how to implement and evaluate interventions. This perspective supports the view that contemporary school leadership requires more than general managerial competence or broad vision statements; it requires attention to what leaders and their colleagues accomplish and how they evaluate their efforts.

A Broad Overview of Educational Leadership Research

Educational leadership research has long explored whether school leaders influence student outcomes and how that influence occurs. Decades of research have shown that leadership is an important school-related factor in student learning and school improvement (Grissom et al., 2021; Leithwood et al., 2004). However, the size and consistency of its effects have varied across studies and syntheses (Hallinger & Heck, 1998; Robinson et al., 2008; Witziers et al., 2003). To explain these varied findings, researchers have increasingly distinguished between direct and indirect effects. Early work often examined direct relationships between leadership and student achievement. These direct effects were generally mixed and small (Hallinger & Heck, 1996; Witziers et al., 2003). Over time, a stronger line of research argued that leadership influences student learning primarily indirectly, through school conditions, teacher practices, organizational structures, and professional culture (Bossert et al., 1982; Hallinger & Heck, 1996, 1998; Leithwood et al., 2020; Ross & Gray, 2006; Sebastian & Allensworth, 2012). This perspective shifted attention from whether leadership matters to how leadership works.

As the field expanded, researchers developed multiple ways to conceptualize and organize leadership. Some research has been structured around broad leadership models or approaches, most notably instructional, transformational, and distributed leadership, which remain among the most frequently studied models in educational leadership research (Gumus et al., 2018). At the same time, researchers increasingly treat these models as overlapping rather than wholly distinct, with some research emphasizing integrated models (Day et al., 2016; Hallinger, 2003; Marks & Printy, 2003). Beyond these broad models, researchers have developed frameworks that organize leadership work into broader domains or categories and more specific dimensions, functions, and practices, although the terminology and organization vary across

frameworks (Hallinger & Murphy, 1985; Hitt & Tucker, 2016; Leithwood, 2012). Other work has focused less on categorizing leadership behaviors and more on explaining how leadership influences outcomes through intermediate processes, as described by models such as Leithwood et al.'s (2010) Four Paths model.

The distinction between broad and specific leadership work guides the review that follows. A model offers an account of leadership as an overall approach, whereas a framework organizes its responsibilities or components. In this dissertation, domains refer to broad areas of responsibility, dimensions to more specific areas of related leadership work, and practices to particular leadership activities or routines. The reviewed authors do not necessarily use these terms in the same way. Their original terminology is retained when describing their work, and the differences are examined more closely after the model and framework reviews.

Major Leadership Models and Their Development

Educational leadership research relies on leadership models to systematically examine and compare how leaders influence teaching, learning, and school improvement. Leadership models provide structured accounts of leadership work by identifying key features and explaining how these elements relate to one another. In this way, models help researchers study leadership and compare findings across studies (Hallinger, 2003; Leithwood, 2012; Leithwood & Riehl, 2005). Beyond research, leadership models and frameworks also clarify essential areas of focus and expected forms of leadership work, thereby informing professional practice and leadership development (Hitt & Tucker, 2016; Murphy, 2005).

The use of models reflects the complexity of educational leadership itself. Leadership does not operate as a single, isolated behavior. Rather, it involves multiple forms of influence exercised through instructional, organizational, and relational work (Grissom et al., 2021;

Leithwood & Riehl, 2005). The major models originate from different theoretical backgrounds and emphasize different mechanisms of influence, yet each provides a distinct way of conceptualizing leadership in schools.

The following sections retain attention to both theory and evidence. Each examines the foundations of a major model, its reported relationships with student learning, and limitations identified in the literature. These accounts provide the foundation for the later discussion of leadership work that appears within and across models.

Transformational Leadership

Definition and Theoretical Foundations

Transformational leadership is one of the most frequently studied leadership models in educational leadership research (Gumus et al., 2018). Its conceptual roots are typically traced to Burns (1978), who distinguished between transformational and transactional leadership and argued that transformational leaders move followers beyond exchange relationships toward shared purpose, higher commitment, and collective goals. Transactional leadership concerns exchanges through which leaders clarify expectations and connect performance with rewards or corrective responses. Bass (1985, 1995) later extended this work by developing a more measurable framework and arguing that transformational and transactional leadership are not necessarily opposites, but can be complementary (Leithwood & Jantzi, 2005). In Bass's model, transformational leadership is commonly described through four core dimensions, often referred to as the Four I's: idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration (Bass, 1985; Bass & Avolio, 1994; Leithwood & Jantzi, 2005). These dimensions describe leaders who model values and credibility, communicate a compelling

vision, encourage new ways of thinking, and attend to individual followers' needs and development.

Researchers adapted transformational leadership to school contexts rather than importing Bass's organizational model directly. In education, this adaptation emerged partly in response to top-down, policy-driven change and directive leadership styles (Hallinger, 2003). Leithwood and colleagues played a central role in shaping this school-based version of transformational leadership, developing a model that emphasized goal-setting and staff motivation (Hallinger, 2003; Leithwood & Jantzi, 2000, 2005). Although scholars have conceptualized transformational leadership in different ways, school-based formulations have consistently emphasized strengthening commitment to shared goals and providing individualized support. Hallinger (2003) described this transformational leadership as bottom-up, second-order change.

Over time, transformational leadership in schools evolved. Early work by Leithwood identified a range of leadership dimensions, including vision building, intellectual stimulation, individualized support, modeling, high expectations, and participation in decision-making (Hallinger, 2003; Leithwood, 1994; Leithwood & Jantzi, 2000; Leithwood et al., 1999). Subsequent syntheses further organized these elements into categories such as setting directions, developing people, redesigning the organization, and improving the instructional program, with related transactional practices identified separately (Leithwood & Sun, 2012). This progression reflects a shift from the more general Four I's (Bass & Avolio, 1994) toward a more comprehensive and education-specific model of leadership that more clearly captures the range of work required in school settings.

Scholars have argued that transformational leadership in schools is limited when it underrepresents managerial and transactional work. Leithwood and Jantzi (2005) highlighted the

need to specify managerial practices that provide a stable organizational base for transformational leadership. They also discussed Bass's argument that transformational behaviors can complement transactional leadership, including contingent reward and management by exception (Bass, 1995; Leithwood & Jantzi, 2005). At the same time, later models expanded transformational leadership to include a more explicit instructional focus. In Leithwood and Sun's (2012) synthesis, for example, improving the instructional program appeared as a distinct category. School-based adaptations therefore incorporated stronger attention to organizational improvement, instructional work, and managerial support alongside traditional transformational elements.

This evolution is important because it shows how a major leadership model became increasingly organized into more specific dimensions and components over time. Table 2.1 presents an early model from Leithwood (1993), while Table 2.2 shows a later synthesis from Leithwood and Sun (2012) that includes an explicit instructional category. These tables retain the authors' terminology and illustrate changes in how the model's content was organized.

Table 2.1

Leithwood's (1993) Dimensions and Behaviors of Transformational School Leadership

Dimensions	Behaviors
Identifies and articulates a vision	Identifies new opportunities, develops and articulates a shared vision, and inspires others toward that vision.
Fosters the acceptance of group goals	Promotes cooperation and helps staff work toward common goals.
Conveys high performance expectations	Demonstrates expectations for excellence, quality, and high performance.
Provides appropriate models	Sets an example consistent with espoused values.
Provides intellectual stimulation	Challenges staff to re-examine assumptions and rethink their work.
Provides individualized support	Shows respect for individuals and concern for their feelings and needs.

Dimensions	Behaviors
Contingent reward	Clarifies actions linked to rewards and provides performance feedback.
Develops a strong school culture	Reinforces norms and values around service to students, professional learning, and collaborative problem solving.

Note. Author-created summary of the dimensions and behaviors described by Leithwood (1993).

Table 2.2

Leithwood and Sun's (2012) Organization of Transformational School Leadership Practices

Category or dimension	Practices
Setting directions	Developing a widely shared vision or goals and building consensus; holding high performance expectations.
Developing people	Providing individualized support or consideration; providing intellectual stimulation; modeling behavior.
Redesigning the organization	Strengthening school culture; building collaborative structures; providing a community focus.
Improving the instructional program	Focusing on instructional development.
Related practices	Contingent reward; management by exception.

Note. Summary of the organization in Leithwood and Sun (2012, Table 1, p. 399). The authors presented related transactional practices separately. Alternative labels within individual instruments are abbreviated here.

Impact on Student Learning

Transformational leadership has been linked to positive school and teacher outcomes, although its relationship with student achievement has varied. Rather than influencing learning primarily through direct effects on instruction, transformational leadership has often been understood as operating through conditions such as school culture, teacher commitment, job satisfaction, and related organizational factors (Leithwood & Jantzi, 2005; Ross & Gray, 2006). Leithwood and Sun (2012) also synthesized findings about teacher behaviors, including use of knowledge, effectiveness, and collaboration. These findings extend the discussion beyond

motivation to teachers' professional work, while remaining distinct from the student-achievement findings.

Meta-analytic findings have also varied substantially. For example, Leithwood and Sun (2012) reported a small overall relationship with student achievement ($d = 0.18$), whereas Chin (2007) reported a larger observed relationship ($d = 1.12$). Almarshad (2017) also highlighted variation in transformational leadership findings, noting that some reported effects were weak, others were stronger, and a few were negative. These findings suggest that the magnitude of the relationship varies across studies. Leithwood and Sun's student-achievement synthesis used direct-effect designs because the available indirect estimates could not be combined. Their student-achievement estimate therefore reflects direct rather than indirect relationships.

Beyond variation in reported model relationships, the transformational leadership model itself also varies. In their review, Leithwood and Sun (2012) found that specific practices differed in their reported relationship with student achievement. For example, building collaborative structures was associated with a larger observed direct relationship ($d = 0.35$), whereas providing intellectual stimulation was associated with a smaller observed one ($d = 0.10$). This internal variation is important because broad model-level findings alone do not clearly show what within transformational leadership matters most for student learning. Potential reasons for these differences are examined in the following section.

Gaps and Limitations

Research on transformational leadership has made important contributions, yet several limitations remain. One major challenge is conceptual and measurement inconsistency. The educational literature has not treated transformational leadership as a fully stable or consistent construct. Across studies, it has been defined and measured in different ways, sometimes through

Bass and Avolio's (1994) full-range leadership framework, sometimes through early school-based adaptations, and sometimes through later school-based formulations that more explicitly incorporate instructional and managerial responsibilities (Leithwood & Jantzi, 2000, 2005; Leithwood & Sun, 2012). The Nature of School Leadership survey was associated with Leithwood, Aitken, and Jantzi's school-leadership research, whereas the Multifactor Leadership Questionnaire was developed by Bass and Avolio (as described in Leithwood & Sun, 2012, pp. 398–399). Leithwood and Sun (2012), for example, found that the leadership instrument itself moderated relationships with school culture. Transformational school leadership measured by the Nature of School Leadership survey correlated more strongly with school culture than transformational leadership measured by the Multifactor Leadership Questionnaire (Leithwood & Sun, 2012). The instruments represented the model differently, and their findings could not be treated as interchangeable.

A related limitation is that transformational leadership has often offered only a partial solution to improving student learning. As Leithwood and Sun (2012) argued, transformational school leadership identified important internal states and organizational conditions, but it did not by itself specify the predictable changes in organizational members' behavior required to improve student achievement. In other words, the model explained how leaders build commitment, shared goals, and supportive conditions, but was less specific about the concrete instructional changes through which those conditions translate into improved learning. This limitation helps explain why later school-based formulations expanded transformational leadership to include instructional components and why some scholars have argued that transformational and instructional approaches are more powerful when enacted together rather than in isolation (Day et al., 2016; Hallinger, 2003).

A third limitation is the inconsistency of findings across studies and syntheses. As the preceding section showed, reported relationships between transformational leadership and student achievement vary substantially across reviews, and the strength of the relationship also differs across practices within the model. Differences in leadership content, instruments, outcomes, and research designs complicate the interpretation of this variation (Leithwood & Jantzi, 2005; Leithwood & Sun, 2012). This lack of convergence makes it difficult to determine how consistently and strongly transformational leadership contributes to student learning across contexts.

Finally, much of the literature has focused on transformational leadership as a broad model rather than examining the specific dimensions and practices through which it may influence learning. This challenge matters for practice because broad model labels provide less precise guidance to school leaders than specific dimensions and practices, and they do not clearly show which areas of leadership work matter most. Leithwood and Sun (2012) argued for greater attention to specific practices, including those shared with other leadership models. Their argument identified a need to connect theory with more precise evidence about the work of school leadership.

Instructional Leadership

Definition and Theoretical Foundations

Instructional leadership has been a foundational and enduring model in educational leadership research. Its roots are commonly traced to the effective schools movement of the 1970s and early 1980s. During this time, research on school effectiveness began identifying leadership practices linked to strong academic focus, high expectations, and better teaching and learning conditions (Bossert et al., 1982; Edmonds, 1979; Hallinger, 2003; Hallinger & Murphy,

1985). During the early 1980s, several conceptualizations of instructional leadership emerged, most rooted in the broader literature on effective schools and school improvement (Hallinger, 2003; Leithwood & Montgomery, 1982; van de Grift, 1990). Early conceptions focused primarily on the principal's role in coordinating, controlling, supervising, and developing curriculum and instruction. Instructional leadership was initially understood largely as a unitary role of the elementary school principal (Bamburg & Andrews, 1991; Hallinger, 2003; Hallinger & Murphy, 1985; Leithwood & Montgomery, 1982). Hallinger (2003) noted that these leaders were often portrayed as strong, directive, and hands-on principals who were deeply engaged in curriculum and instruction, oriented toward improving student academic outcomes, and committed to fostering an academic press within the school (Cuban, 1984; Hallinger, 2003; Hallinger & Murphy, 1986; Mortimore, 1993; Purkey & Smith, 1983). Hallinger (2003) further argued that instructional leadership is best understood as a form of first-order change, focusing on the conditions that directly affect the quality of instruction delivered to students.

Hallinger and Murphy (1985) developed the most widely cited instructional leadership framework. Their model organized instructional leadership into three broad dimensions: defining the school's mission, managing the instructional program, and promoting a positive school learning climate (Hallinger, 2001, 2003, 2005; Hallinger & Murphy, 1985; Heck, 1992). Table 2.3 summarizes these dimensions and the specific instructional leadership functions associated with them, providing one of the clearest early examples of leadership organized into distinct dimensions. This framework positioned the academic core as a central leadership responsibility and assumed that the principal was responsible for ensuring that school goals were translated into classroom practice (Hallinger, 2003; Hallinger & Murphy, 1985). In Hallinger and Murphy's (1985) formulation, instructional leadership was not simply a general orientation toward

learning, but a structured model of leadership work focused on mission, instruction, and school climate. The model later became especially influential through its use in the Principal Instructional Management Rating Scale (PIMRS), which provided one of the first widely used instruments for empirically measuring instructional leadership (Hallinger & Murphy, 1985). The PIMRS became the most frequently used instrument in international research on instructional leadership and helped establish Hallinger and Murphy's framework as the dominant model in the field (Hallinger, 2005; Hallinger & Murphy, 1985).

Table 2.3

Hallinger and Murphy's (1985) Dimensions of Instructional Management and Specific Functions

Dimensions	Functions
Defining the school mission	Framing the school goals; communicating the school goals.
Managing the instructional program	Supervising and evaluating instruction; coordinating the curriculum; monitoring student progress.
Promoting a positive school learning climate	Protecting instructional time; promoting professional development; maintaining high visibility; providing incentives for teachers; enforcing academic standards; providing incentives for students.

Note. Summary of Hallinger and Murphy (1985, Table 1, p. 221), using the expanded dimension descriptions in their text.

Instructional leadership has remained highly influential, but later scholarship broadened the model beyond its early principal-centered form. Over time, researchers advanced more collaborative and learning-focused conceptions, including shared instructional leadership (Marks & Printy, 2003), learning-centered leadership (Murphy et al., 2006), and leadership for learning (Hallinger, 2011), while preserving the central focus on improving teaching and learning. This later work challenged the image of the principal as the sole instructional authority and instead emphasized leadership for learning as broader, more collaborative, and more responsive to organizational and environmental context (Hallinger, 2011; Marks & Printy, 2003). At the same

time, these broader formulations did not abandon the earlier model's core instructional concern. Rather, they extended it by incorporating wider sources of leadership, more interactive relationships with teachers, and a stronger recognition of context, improvement capacity, and shared responsibility for learning (Hallinger, 2011). In summary, this literature suggests that instructional leadership has endured because it keeps leadership anchored to the academic core of schooling, even as later scholarship has pushed the model toward more collaborative, context-sensitive, and practice-oriented forms.

Impact on Student Learning

Instructional leadership has generally been associated with positive student outcomes, although estimates have varied across syntheses. Almarshad (2017) reported $d = 0.56$, while Karadağ (2020) reported $d = 0.72$. Liebowitz and Porter's (2019) estimate for instructional management was $d = 0.11$. These differences call for attention to the content and measurement of instructional leadership as well as the numerical findings.

Robinson et al. (2008) provided an influential comparison of instructional and transformational leadership. Their standardized estimates were $d = 0.42$ for instructional leadership and $d = 0.11$ for transformational leadership. The two leadership categories drew on different compositions of student outcomes, particularly academic versus social outcomes. The authors argued that leadership more closely connected with teaching and learning showed stronger relationships with student outcomes. Their separate analysis of specific leadership dimensions is considered later in this chapter.

Some evidence also suggests that instructional leadership is not equally influential across all of its components. Research focused on principal behaviors has indicated that certain instructional activities may be more consequential for student learning than others. Grissom et al.

(2013) found that specific instructional activities, such as teacher coaching, evaluation, and development of the school's educational program, were associated with mathematics achievement gains, whereas broader time spent on instructional functions did not predict achievement growth. The findings for reading were less conclusive. These findings suggest that the relationship between instructional leadership and student learning may depend in part on which specific aspects of the model are examined.

Context further complicates a general account. Pietsch et al. (2025) found substantial cross-context variation in the instructional leadership–achievement relationship using international assessment data. Their analysis is examined in the contextual section below because it raises questions about the settings and measures to which broad conclusions apply.

Instructional leadership has kept attention on the academic purposes of schooling. Its research base also shows why the general label needs to be accompanied by a clear account of the activities, measures, and outcomes examined.

Gaps and Limitations

Despite the substantial development of instructional leadership research, important gaps and limitations remain. One major challenge is conceptual inconsistency. Although instructional leadership is among the most frequently studied leadership models, scholars have not always defined it consistently. Early models emphasized the principal's direct role in coordinating, supervising, and improving curriculum and instruction, whereas later scholarship expanded instructional leadership toward more collaborative, shared, and learning-centered forms of leadership (Gumus et al., 2018; Hallinger & Murphy, 1985; Marks & Printy, 2003). Related reviews have also noted that researchers continue to differ in how they define effective

leadership practices, limiting the field's ability to build cumulative knowledge across frameworks and studies (Gumus et al., 2018; Hitt & Tucker, 2016).

A second limitation concerns measurement and specificity. Much of the instructional leadership literature has relied on survey instruments that capture perceptions of leadership rather than direct observations of practice. At the same time, researchers have noted that instructional leadership remains a broad construct and that, without greater specificity, practitioners have limited guidance on which behaviors to develop or prioritize (Grissom & Loeb, 2011; Grissom et al., 2013; Murphy, 1988; Neumerski, 2013; Rigby, 2014).

A third persistent limitation is inconsistent attention to context. School conditions influence leadership effects, but research does not consistently include contextual variables (Bossert et al., 1982; Hallinger, 2018; Hallinger & Heck, 2010). Studies suggest that factors such as school level, socioeconomic context, and stage of development shape leadership, yet these are insufficiently examined to allow generalizable conclusions. Thus, findings may not transfer across settings.

The instructional leadership literature therefore supports further examination of specific work without assuming that one model describes a single, uniform set of practices. Questions of meaning, measurement, and setting remain important when comparing its findings with those from other leadership approaches.

Distributed Leadership

Definition and Theoretical Foundations

Distributed leadership has emerged as a significant alternative to conventional leader-centered models by shifting attention away from the actions of a single formal leader and toward leadership practice spread across multiple people, roles, and situations. In contrast to traditional

approaches that focused primarily on the principal as the central source of leadership, distributed leadership reconceptualized leadership as something enacted by formal and informal leaders working interdependently within an organization (Camburn et al., 2003; Gronn, 2002; Spillane et al., 2001). This perspective developed in part in response to dissatisfaction with heroic and individualistic conceptions of leadership and to a growing recognition that the complexity of school improvement work could not be adequately addressed by the actions of a single person (Diamond & Spillane, 2016; Gronn, 2002, 2009). As Gronn (2002) argued, conventional leadership constructs struggle with the changing divisions of labor and new forms of interdependence, and they have difficulty accommodating these changes and the increasingly visible role of people acting together in organizations.

The theoretical foundations of distributed leadership rest less on traditional trait or style theories and more on perspectives such as distributed cognition, activity theory, and sociocultural theories of practice (Gronn, 2002; Spillane et al., 2001). From this perspective, leadership is not simply a role or position, but a practice constituted through the interactions of leaders, followers, and the social and material conditions in which they work (Diamond & Spillane, 2016; Spillane et al., 2001). Their framework shifted the unit of analysis from the individual leader to leadership activity itself, especially the activity involved in establishing conditions for teaching and learning. Distributed leadership was developed not only as an alternative to leader-centered models, but also as a practice-based framework for understanding how leadership actually gets done in schools (Camburn et al., 2003; Diamond & Spillane, 2016; Spillane et al., 2001).

Within educational leadership, distributed leadership gained traction as researchers increasingly questioned principal-centered and hierarchical models of school leadership. As the broader field moved away from heroic, solo conceptions of leadership, distributed leadership

emphasized interdependence, expertise, and multiple sources of influence in schools (Adams et al., 2026; Diamond & Spillane, 2016; Gronn, 2009; Gumus et al., 2018; Harris, 2008). This shift was also connected to dissatisfaction with earlier instructional leadership models, which were often principal-centered and unitary in their assumptions about who leads teaching and learning (Gumus et al., 2018), as well as to broader critiques of leader-centered models that could not adequately capture interdependence, shared practice, and changing divisions of labor in schools (Gronn, 2002; Spillane et al., 2001). In contrast, distributed leadership emphasized that leadership may be stretched across principals, assistant principals, teacher leaders, coaches, and others, depending on the task, expertise, and situation (Diamond & Spillane, 2016; Spillane et al., 2001).

Distributed leadership has often been discussed alongside collaborative, shared, democratic, or dispersed leadership. These terms are related, but they do not necessarily describe the same idea. Diamond and Spillane (2016) distinguished a distributed perspective on how leadership practice is accomplished from a general preference for sharing leadership. They described three forms: collaborated distribution, in which people work together at the same time and in the same place; collective distribution, in which people work separately but interdependently; and coordinated distribution, in which their contributions occur in sequence.

At the same time, the literature has also raised cautions about the concept. Gronn (2009) argued that distributed leadership alone may not fully capture the mixed patterns of concentrated and dispersed influence found in practice and proposed the idea of leadership configurations to better describe hybrid arrangements. Diamond and Spillane (2016) likewise warned that loose use of the term can complicate diagnostic work and create a false sense of consensus.

Unlike instructional and transformational leadership, distributed leadership is not typically organized into a fixed set of dimensions or practices that can be represented in a single model. This matters for the present study because distributed leadership is influential but less structurally fixed than other major leadership models and therefore harder to compare at the model level. Instead, it is better understood as a conceptual framework for examining how leadership practice spreads across multiple actors, roles, and situations (Diamond & Spillane, 2016; Harris, 2013; Spillane et al., 2001).

Impact on Student Learning

Distributed leadership has been associated with school improvement through the coordinated contributions of people with different responsibilities and expertise (Diamond & Spillane, 2016; Harris, 2008). This perspective provides a reason to examine how principals, teachers, and other staff work together. It does not, by itself, establish that all forms of shared leadership produce stronger student outcomes than concentrated leadership.

Empirical findings suggest that distributed leadership is positively related to student achievement, although the magnitude of that relationship varies across syntheses. For example, Ertem (2021) reported a positive relationship between distributed leadership and student achievement ($d = 0.54$). In comparison, Karadağ et al. (2015) reported a larger observed relationship for distributed leadership ($d = 0.93$). That estimate was based on only two contributing studies, and the analysis did not establish statistically significant differences between leadership styles. These distinctions indicate that while distributed leadership can be meaningfully associated with student learning, its reported effect varies in strength with different models and across meta-analytic studies.

The empirical literature consequently needs to distinguish the distribution of responsibility from the quality and purpose of the resulting work. Diamond and Spillane (2016) emphasized the interactions through which leadership is accomplished, while later reviews continued to examine how the concept has been used across studies (Adams et al., 2026). An overall distributed-leadership estimate provides limited guidance unless the activities and relationships represented by the measure are also clear.

Gaps and Limitations

Despite the growth of distributed leadership research, important gaps and limitations remain. One major challenge concerns the conceptual breadth and variation in how distributed leadership is used across the literature. Some scholars treat it as a conceptual framework for examining leadership practice, whereas others use it to describe a desirable form of shared, democratic, or collaborative leadership (Adams et al., 2026; Diamond & Spillane, 2016; Mayrowetz, 2008). This breadth matters for evidence synthesis because it is not always clear whether studies examine distributed leadership as a distinct construct or use it as a broad label for collective activity.

A second limitation concerns the unit of analysis and the uneven translation of theory into research. One of the major contributions of distributed leadership was its attempt to shift attention away from the solo leader and toward leadership practice stretched across people, tools, and situations (Gronn, 2002; Spillane et al., 2001). However, empirical studies have not always carried through this theoretical shift consistently. Some studies still rely on broad aggregated measures or treat distribution mainly as the presence of multiple leaders, rather than examining how leadership is enacted through interdependent practice (Camburn et al., 2003). Gronn (2009) argued that such aggregated understandings may oversimplify leadership by failing to capture the

hybrid configurations through which concentrated and dispersed influence coexist in practice. Similarly, Leithwood et al. (2009) argued that researchers need to be clearer about the anatomy of distributed leadership and that some patterns of distribution are more effective than others. This makes it difficult to determine what counts as distributed leadership in practice and how to compare different forms of distribution across studies.

A third limitation is the uneven precision of the evidence base. Distributed leadership research has generated important insights into how leadership is carried out together, coordinated, and shared across multiple people, but it has often been more effective at illuminating leadership practice than at isolating which specific distributed arrangements are most strongly associated with student outcomes. Some reviews note that distributed leadership has become highly popular among researchers, policymakers, and reformers, even though the empirical evidence linking it directly to improved pupil outcomes has at times remained limited or uneven (Hammersley-Fletcher & Brundrett, 2005; Storey, 2004). In addition, recent work continues to suggest that distributed leadership can positively influence school and teacher outcomes under the right conditions, but this evidence often spans a wide range of organizational and professional outcomes rather than identifying a narrow set of high-leverage leadership practices (Adams et al., 2026). This suggests the need for more precise research on which forms of distributed leadership matter most for student outcomes.

Finally, distributed leadership research continues to face challenges related to power, authority, and context. Although the model is often presented as an alternative to leadership centered on a single formal leader, later work has noted that formal leaders still matter substantially within distributed arrangements and that authority, legitimacy, and organizational conditions shape how leadership is shared and enacted (Diamond & Spillane, 2016; Gronn,

2009; Harris, 2008). Some critics have also argued that distributed leadership can give insufficient attention to power, avoid political questions, or appear desirable without sufficient empirical support (Flessa, 2009; Harris, 2013; Hartley, 2009; Lumby, 2013). In summary, these limitations suggest that distributed leadership remains a valuable and influential perspective, but one still constrained by conceptual breadth, inconsistent definitions and measures, limited precision about effective forms of distribution, and insufficient clarity about which arrangements are most strongly associated with student outcomes.

Other Leadership Theories and Approaches

The educational leadership literature includes a wide range of additional theories and approaches beyond the major models discussed above. These include, among others, authentic leadership, servant leadership, adaptive leadership, entrepreneurial leadership, charismatic leadership, laissez-faire leadership, eco-leadership, and culturally responsive leadership (Avolio & Gardner, 2005; Bass & Avolio, 1994; Greenleaf, 1977; Heifetz & Linsky, 2002; Khalifa et al., 2016; Kuratko, 2007; Western, 2013). Together, these approaches emphasize key aspects of leadership, including ethical responsibility, service to others, responsiveness to complex and changing contexts, innovation, and attention to equity and cultural relevance.

These theories and approaches are acknowledged here to reflect the breadth of educational leadership literature. However, this review does not treat them as primary organizing categories because the dissertation does not compare named leadership theories or determine which broad leadership approach is most effective. The review emphasizes leadership dimensions and related practices as a foundation for examining how leadership is associated with student outcomes. Theoretical approaches remain relevant because they shape what researchers examine and how they explain their findings.

This distinction matters because many leadership theories and approaches overlap conceptually, and studies often describe similar leadership work using different labels. As a result, organizing the literature primarily around named leadership approaches can obscure the finer details of leadership work within those approaches. As Leithwood and Jantzi (2005) argued, “The field does not need yet another adjective in front of the term leadership” (p. 194). Their argument supports closer attention to the specific dimensions and practices through which leadership influences teaching, learning, and school improvement, rather than dismissing the contribution of theory.

Alternative Frameworks for Conceptualizing Leadership

Some influential frameworks have organized leadership through recurring responsibilities and practices rather than a single named leadership approach. Robinson et al. (2008) and Hitt and Tucker (2016) provide two examples. Their purposes and procedures differed, but both examined leadership work more specifically than a whole-model label.

Robinson et al. (2008): Student-Centered Leadership

Robinson et al. (2008) provided an empirically derived framework for understanding educational leadership in relation to student outcomes. In contrast to leadership models grounded primarily in preexisting leadership theories, Robinson et al. (2008) used a meta-analytic approach to organize leadership according to its relationship with student learning. Their framework was developed by reviewing leadership survey items from prior studies and grouping them into common themes. Their framework represents an inductive approach in which leadership is conceptualized not primarily by theoretical origin, but by synthesizing existing research.

Through their synthesis, Robinson et al. (2008) identified five key leadership dimensions associated with student outcomes. Table 2.4 summarizes these dimensions and highlights selected activities associated with planning, coordinating, and evaluating teaching and the curriculum. Together, these dimensions reflect a strong emphasis on leadership work that is closely connected to teaching and learning, particularly leadership that shapes instructional quality, teacher development, and the conditions that support student achievement.

Table 2.4

Robinson et al.'s (2008) Leadership Dimensions and Selected Activities

Dimensions	Selected activities described by the authors
Establishing goals and expectations	
Strategic resourcing	
Planning, coordinating, and evaluating teaching and the curriculum	Collegial discussion of teaching and its impact; coordination of the instructional program; classroom observation and feedback; monitoring student progress and using findings for improvement.
Promoting and participating in teacher learning and development	
Ensuring an orderly and supportive environment	

Note. Summary of Robinson et al. (2008). Activities are shown for the dimension elaborated in the accompanying discussion. Blank cells do not indicate an absence of practices or evidence. The activities are not separately estimated effects.

The observed relationships of the five dimensions with student outcomes varied in magnitude. The largest estimate was for promoting and participating in teacher learning and development ($d = 0.84$). Establishing goals and expectations had an estimate of $d = 0.42$, as did planning, coordinating, and evaluating teaching and the curriculum ($d = 0.42$). Strategic resourcing had an estimate of $d = 0.31$, and ensuring an orderly and supportive environment had an estimate of $d = 0.27$ (Robinson et al., 2008).

Robinson et al.'s (2008) framework offers an alternative way to organize leadership research. Instead of beginning with a predefined model, it derives leadership dimensions from patterns in the empirical literature and links those dimensions to student outcomes. In doing so, it provides a bridge from model-based conceptions of leadership to a more detailed examination of leadership dimensions and practices.

Hitt and Tucker (2016): A Unified Framework of Leadership Practice

Hitt and Tucker (2016) provided a comprehensive synthesis of leadership research that moved beyond individual leadership models to identify a unified set of empirically supported leadership practices. Rather than advancing a framework focused on an individual theory of leadership, their work systematically reviewed the literature on leadership and student achievement and integrated findings across multiple established frameworks. Specifically, their synthesis drew heavily on three major bodies of work: the Learning-Centered Leadership framework (Murphy et al., 2006), the Ontario Leadership Framework (Leithwood, 2012), and the Essential Supports framework (Sebring et al., 2006). Their review included 56 empirical studies.

Hitt and Tucker (2016) synthesized the common and overlapping practices across these frameworks into a unified structure. They noted that the frameworks differed in terminology and organization, with some constructs treated as broad domains in one framework and as more specific dimensions or practices in another. They compared the frameworks, combined conceptually similar practices, and organized 28 practices into five broad domains. The authors explicitly used dimensions to refer to leaders' actions or practices and domains to refer to groupings of those dimensions. Table 2.5 summarizes these domains and dimensions.

Table 2.5

Hitt and Tucker's (2016) Domains and Dimensions of Leadership Practice

Domain	Dimensions
Establishing and conveying the vision	Creating, articulating, and stewarding shared mission and vision; implementing vision by setting goals and performance expectations; modeling aspirational and ethical practices; communicating broadly the state of the vision; promoting use of data for continual improvement; tending to external accountability.
Facilitating a high-quality learning experience for students	Maintaining safety and orderliness; personalizing the environment to reflect students' backgrounds; developing and monitoring the curricular program; developing and monitoring the instructional program; developing and monitoring the assessment program.
Building professional capacity	Selecting for the right fit; providing individualized consideration; building trusting relationships; providing opportunities to learn for the whole faculty, including leaders; supporting, buffering, and recognizing staff; engendering responsibility for promoting learning; creating communities of practice.
Creating a supportive organization for learning	Acquiring and allocating resources strategically for mission and vision; considering context to maximize organizational functioning; building collaborative processes for decision making; sharing and distributing leadership; tending to and building on diversity; maintaining ambitious and high expectations and standards; strengthening and optimizing school culture.
Connecting with external partners	Building productive relationships with families and external partners in the community; engaging families and community in collaborative processes to strengthen student learning; anchoring schools in the community.

Note. Summary of Hitt and Tucker (2016, Table 6, pp. 543–544). The authors used dimensions for leaders' actions or practices and domains for their broader groupings. The source order and placement of maintaining safety and orderliness are retained.

This framework matters because it shows that instructional, organizational, relational, and improvement-oriented leadership work often overlap across the literature, even when researchers use different labels or organize constructs differently. For example, work related to vision, instructional improvement, professional capacity, school culture, and family or community engagement appears across multiple frameworks, although not always under the

same terminology or hierarchical structure (Hitt & Tucker, 2016; Leithwood, 2012; Murphy et al., 2006; Sebring et al., 2006).

This approach provided a connection between broad responsibilities and more specific leadership work. It did not establish that all frameworks were interchangeable or that each included practice had the same relationship with achievement. For the present review, it provides a useful example of how a synthesis can preserve the substance of different frameworks while making their similarities and differences more visible.

Domains, Dimensions, and Practices Across Frameworks

The frameworks reviewed above organize leadership at different levels of specificity. Some group responsibilities into broad areas, while others examine a particular function or the activities through which it is carried out. These distinctions are useful for understanding what a finding represents. An estimate for a whole leadership model addresses a different question from an estimate for goal setting, professional learning, or classroom observation and feedback. However, the labels used in the literature do not consistently identify those differences (Hitt & Tucker, 2016; Leithwood & Sun, 2012; Robinson et al., 2008).

Broader Responsibilities and More Specific Dimensions

Domains provide a way to discuss broad responsibilities that include related dimensions of leadership work. The frameworks reviewed by Hitt and Tucker (2016) and Leithwood (2012) illustrate how such groupings can connect specific activities with the responsibilities they serve. Their different organizations also show that a domain is not an agreed category with identical content across the literature. Its meaning depends on the work an author places within it.

Dimensions make those broad areas more specific. In this dissertation, the term refers to related leadership work organized around a particular function or purpose. Source authors

sometimes used the same term more broadly or narrowly. Hallinger and Murphy (1985), for instance, organized instructional management around three dimensions and associated functions. Robinson et al. (2008) used dimensions for five areas identified through their synthesis. Hitt and Tucker (2016) explicitly called leaders' actions or practices dimensions. These accounts should be understood through their descriptions and measures, not treated as equivalent merely because they use the same word.

Leadership Practices

Practices describe more specific leadership activity. Leithwood (2012) defined a practice as "a bundle of activities exercised by a person or group of persons" (p. 5), emphasizing shared purposes and the circumstances in which the activity occurs. In this dissertation, a practice is a specific leadership activity, routine, or closely related set of activities. This meaning distinguishes a practice from a broader area of responsibility without reducing it to an isolated act. For example, reviewing student progress with teachers can involve gathering information, interpreting it together, and deciding how instruction should respond.

The relationship between a dimension and a practice can be seen in the reviewed frameworks. Hallinger and Murphy's (1985) management of the instructional program included supervision and evaluation, curriculum coordination, and monitoring student progress. Leithwood and Sun (2012) described practices such as individualized support and intellectual stimulation within their account of transformational school leadership. These examples show how researchers have made broad leadership work more specific, although the authors did not necessarily use practices, functions, and behaviors in identical ways.

Specificity alone does not establish effective practice. Robinson et al. (2008) argued that their dimensions remained too abstract to explain fully the processes responsible for their effects.

Their discussion called attention to the qualities of activities such as professional learning and evaluation, not simply how often leaders undertook them. Robinson and Gray (2019) similarly distinguished the frequency of leadership activity from the quality of its enactment. A more specific account is useful when it clarifies the purpose, participants, and substance of the work, rather than creating a checklist of disconnected behaviors.

Interpreting Differences in Terminology

A consistent review must therefore distinguish its own organizing language from the terminology used by the authors it reviews. Different labels may describe related work, while an identical label may cover different responsibilities or activities. Witziers et al. (2003), for example, examined relatively specific leadership behaviors alongside broader concerns such as achievement orientation. The original labels remain important, but their meaning depends on what the source included in each category. The following discussion brings related research together by the leadership work addressed, without implying that the authors used a common classification.

Recurring Areas of Leadership Work

Across the major models and frameworks, research repeatedly addresses establishing direction, developing people, leading instruction, and organizing the conditions for learning. The following four sections develop these recurring areas from the literature already reviewed. They are organizing themes for this chapter, not a claim that the field has adopted four domains or that every leadership activity has one exclusive location. Each brings broader responsibilities into relation with more specific dimensions and practices.

Establishing Direction and Sustaining Commitment

One recurring area involves the purposes and priorities that guide a school's work. Hallinger and Murphy (1985) emphasized defining the school mission through framing and communicating goals. Leithwood and Sun (2012) identified setting directions within transformational school leadership, while Robinson et al. (2008) examined establishing goals and expectations. Hallinger's (2011) leadership-for-learning account also gave a central place to vision and goals. Although these formulations differed, each connected leadership with a shared understanding of what the school was trying to accomplish.

The more specific practices concern how direction becomes meaningful in the organization. Leithwood (2012) described building a shared vision, identifying specific goals, communicating direction, and creating high performance expectations. These practices involved participation and the connection between longer-term purposes and the work staff undertake. High expectations concerned both the effort devoted to goals and the level of performance sought, including the achievement of students who had experienced difficulty. In this account, direction was more than a statement of aspirations.

Commitment is related to direction but concerns whether people are willing and able to continue working toward it. Transformational leadership research has examined shared purposes, motivation, and the internal states of teachers as part of this process (Leithwood & Jantzi, 2005; Leithwood & Sun, 2012). Hitt and Tucker (2016) included support, encouragement, and recognition within their discussion of professional capacity. These sources place motivational work in different parts of their frameworks, illustrating that its purpose may connect direction-setting with people development.

Recognition also requires attention to what is being recognized and how it relates to educational goals. Leithwood and Jantzi (2005) discussed contingent reward as a transactional element that can operate alongside transformational leadership. Leithwood and Sun (2012) retained contingent reward in their review rather than assuming that all useful leadership work belonged to a purely transformational model. These distinctions suggest that articulating a purpose, building commitment to it, and recognizing contributions are related activities, but not interchangeable descriptions of a single practice.

Taken as an area of responsibility, establishing direction connects educational purpose with the expectations and commitment needed to pursue it. The reviewed frameworks give substance to that responsibility through participation in goal setting, communication, high expectations, and recognition of contributions (Hitt & Tucker, 2016; Leithwood, 2012; Leithwood & Sun, 2012). Their accounts make clear why direction is more than the existence of a mission statement.

Developing People and Collective Capacity

A second recurring area concerns the knowledge, relationships, and collective work through which schools improve. Leithwood and Sun (2012) identified developing people as a central part of transformational school leadership. Robinson et al. (2008) examined promoting and participating in teacher learning and development. Hitt and Tucker (2016) brought together practices concerning professional capacity, including opportunities to learn, individualized consideration, trusting relationships, and communities of practice. These accounts connect leadership with the development of educators rather than treating staff capability as a fixed condition.

The practices described in this literature go beyond arranging attendance at professional development. Leithwood (2012) emphasized support and consideration for individual staff members, stimulation of professional growth, and relationships that allow people to examine their work. Robinson et al. (2008) highlighted leaders' participation in teacher learning as well as their promotion of it. Such participation can connect leadership decisions with the instructional problems teachers are trying to address. The literature thus directs attention to the content and conditions of professional learning, not just its availability.

Individual support and collective learning are connected but distinct. Attending to an educator's needs does not necessarily establish conditions for colleagues to learn together. Leithwood and Sun (2012) placed individualized support within developing people and collaborative structures within redesigning the organization. Hitt and Tucker (2016) also considered both interpersonal relationships and opportunities for professional exchange. Their accounts suggest that people development involves the support provided to individuals and the arrangements through which professional knowledge is shared and examined.

Distributed leadership adds a further perspective by examining how leadership work is accomplished among people. Diamond and Spillane (2016) emphasized interactions among leaders, followers, and their situation rather than simply counting the people assigned leadership roles. This perspective helps distinguish the distribution of tasks from the coordinated use of expertise. It also directs attention to routines and tools that shape professional interaction. A committee or shared title does not, by itself, explain how participants influence teaching or organizational decisions.

Professional culture is relevant because it shapes the expectations and relationships surrounding that work. Grissom et al. (2021) identified productive school climate and

collaboration and professional learning as important areas of principal practice. Their review considered quantitative and qualitative evidence rather than treating those areas as isolated activities. Together, these sources suggest that professional development, personal support, collaboration, and shared leadership should be examined for their particular contributions. The common concern is developing the people and collective capability needed for teaching and learning, but the activities and relationships through which this occurs vary.

Leading Teaching, Learning, and Evaluation

A third recurring area focuses directly on the instructional program. Hallinger and Murphy (1985) described managing instruction through supervision and evaluation, curriculum coordination, and monitoring student progress. Robinson et al. (2008) combined planning, coordinating, and evaluating teaching and the curriculum within a single dimension. Hitt and Tucker (2016) distinguished work concerning the curriculum, instruction, and assessment within a broader learning-experience domain. These formulations identify related responsibilities while differing in how much work is combined within one category.

Coordination concerns how teaching, curriculum, and assessment fit together. Robinson and Gray (2019) described coherence within and across year levels and the importance of examining whether the intended curriculum is being taught and learned. This work is related to classroom observation and feedback, but it addresses a different question. A school may need to examine the progression and alignment of learning opportunities as well as the quality of particular lessons. Broad accounts of instructional leadership can include both responsibilities without providing separate evidence about each.

More specific practices make the instructional work easier to examine. The observation study discussed earlier by Grissom et al. (2013) distinguished coaching, teacher evaluation,

educational-program development, and classroom walkthroughs rather than treating all instructional time as equivalent. The differing associations they reported support examining the content of leadership activity. They also caution against interpreting the frequency of an activity without understanding its purpose. Observation used to support professional learning is not necessarily the same work as a brief visit that provides no subsequent instructional response.

Monitoring and evaluation also raise questions about how evidence informs decisions. Leithwood (2012) described monitoring student learning and school improvement, supporting staff in interpreting evidence, and connecting that evidence with instructional improvement. Hitt and Tucker (2016) included promoting the use of data for continual improvement within their vision domain, while placing curriculum, instruction, and assessment monitoring elsewhere. Evidence use therefore appears across different responsibilities rather than belonging exclusively to one part of a framework.

Hattie (2015) emphasized evaluating whether intended outcomes were worthwhile, who benefited, and whether the evidence warranted continuing or changing an approach. His account connected evaluation with shared understanding of success, the quality of implementation, and teachers' examination of their impact. This extends the discussion beyond collecting information or reporting results. Evidence becomes part of leadership when it informs judgments about teaching, professional learning, school priorities, and the changes needed to improve learning.

Organizing Conditions, Resources, and Partnerships

A fourth recurring area concerns the conditions that allow educational work to occur. Leithwood and Sun (2012) included redesigning the organization, Robinson et al. (2008) examined strategic resourcing and an orderly and supportive environment, and Hitt and Tucker (2016) described organizational support and relationships with external partners. These accounts

recognize that leadership of learning also involves the people, resources, routines, and relationships surrounding instruction.

Resource decisions are educational decisions when they are connected to priorities. Robinson et al. (2008) described strategic resourcing in terms of the resources and expertise needed to achieve teaching goals. Leithwood (2012) similarly discussed allocating resources in support of the school's vision and goals. Grissom et al. (2021) reviewed evidence on managing personnel and resources strategically, including the organizational decisions through which principals support effective teaching. The issue is therefore not only the amount of a resource available, but how its use relates to the work the school is trying to improve.

Organizational functioning also involves protecting opportunities to learn. Hallinger and Murphy (1985) identified protecting instructional time within their school-climate dimension. Leithwood (2012) described buffering staff from distractions and reducing demands that draw them away from agreed goals. These practices are more specific than a general claim that a school is orderly. They concern schedules, interruptions, administrative demands, and the ways leaders organize staff attention. At the same time, a supportive environment includes more than efficient routines; it concerns the conditions in which students and educators undertake their work.

Relationships beyond the school extend this organizational responsibility. Hitt and Tucker (2016) included productive relationships with families and communities, collaborative efforts to strengthen student learning, and connections between the school and its wider community. Leithwood (2012) also described parent relationships and links with the wider environment. These are not simply additional communication tasks. In the reviewed frameworks,

external relationships connect educational purposes with knowledge, participation, and support beyond the school's internal organization.

What Cross-Framework Comparisons Can Establish

Thematic comparison makes recurring leadership work visible, but similarities in description do not establish equal relationships with student outcomes. Liebowitz and Porter (2019), for example, examined instructional management, internal relations, and organizational management in the same review. Their selected estimates were $d = 0.11$, $d = 0.16$, and $d = 0.08$, respectively. Their analyses did not establish that instructional management had a stronger student-achievement relationship than the other behavior categories. They also cautioned about imprecision and the observational evidence, so a lack of an established difference should not be treated as proof that the categories are equivalent.

This comparison complements the differences reported by Robinson et al. (2008) without resolving them. The reviews used different leadership categories and bodies of evidence. A finding about one broad category cannot be transferred automatically to a narrower practice or to a differently defined category in another review. The accumulated research is informative precisely because it provides several views of leadership work, but those views must be understood before their findings are synthesized.

Contextual Influences on Leadership and Student Outcomes

The settings in which leadership is enacted provide another important part of the literature. Hallinger (2011) argued that leadership and learning must be understood in relation to school conditions and the wider environment. The concern is not merely that schools differ. It is whether the relationship between particular leadership work and student outcomes differs across those circumstances. In quantitative research, a moderator is a characteristic associated with

variation in the relationship being examined. Describing a school's context is not, by itself, a test of moderation.

School Level and Setting

School level has received attention because primary and secondary schools differ in their instructional organization and the demands placed on leadership. Hallinger (2011) noted that early effective-schools research concentrated on urban elementary schools in challenging circumstances, raising questions about how well those findings apply to other settings. Witziers et al. (2003) examined school level as one possible explanation for variation in leadership findings. Later reviews did not establish a consistent pattern of school-level differences (Tan et al., 2022). Together, these findings support examining school level without assuming that leadership relationships with student outcomes are the same across grade spans.

School setting adds a different consideration. Urban, suburban, and rural contexts may involve different community relationships, staffing circumstances, and organizational demands. Hallinger's (2011) discussion emphasized the need to examine leadership in relation to those conditions rather than assume that findings from a narrowly defined setting apply to all schools. Setting should also remain distinct from school level. A comparison of primary and secondary schools does not answer a question about urban and rural settings, even when those characteristics occur together in a study.

Socioeconomic and Geographic Context

Socioeconomic conditions matter to the interpretation of leadership research because they concern the opportunities and challenges represented in a school's student population. Hallinger (2011) discussed socioeconomic status and prior achievement as contextual conditions in models of school improvement. Including these characteristics in a model can help account for

differences among schools, but it is not the same as testing whether a leadership relationship differs across socioeconomic groups. A review needs to distinguish those uses when describing the evidence.

Geographic comparisons can also encompass substantial variation. Witziers et al. (2003) examined country differences alongside leadership behaviors and research characteristics. More recently, Pietsch et al. (2025) used international large-scale assessment data to investigate the instructional leadership and achievement relationship across countries. Their findings emphasized contextual variation, including national development and cultural characteristics, rather than one stable association across settings. Geographic evidence should consequently be interpreted in relation to the actual comparisons made. A country label alone does not explain which institutional or cultural conditions account for a difference.

Other Contextual Characteristics and Reporting Limits

Other features also shape the circumstances in which leadership occurs. Hallinger and Murphy (1985) discussed school size, staff expertise, student characteristics, administrative staffing, and community expectations as conditions affecting instructional management. These considerations extend beyond a simple primary-versus-secondary or urban-versus-rural distinction. They provide additional questions for the literature, although identifying a contextual characteristic does not establish that a study tested its effect on the leadership relationship.

School sector concerns distinctions such as public, religious, and private provision. Leithwood and Sun (2012) examined school type in analyses of school conditions and teacher outcomes; those comparisons did not establish whether leadership relationships with student achievement differed by sector. Marzano et al. (2005) also examined the ethnic composition of schools, but cautioned that the available studies provided too little information to support a

conclusion. These examples show why contextual comparisons need to identify both the school characteristic and the outcome examined.

The contextual literature therefore asks how broadly leadership findings can be applied and which conditions warrant closer attention. H. Wu and Shen (2022) concluded that educational contexts appeared relevant to principal leadership, while also identifying limits in the accumulated evidence. Examining these findings across reviews can help distinguish recurring contextual patterns from results confined to particular comparisons.

Toward a Second-Order Meta-Analysis of Leadership Evidence

The literature reviewed in this chapter provides a substantial foundation for understanding school leadership. Instructional, transformational, and distributed approaches have contributed different accounts of leadership and its influence. The framework literature has organized that work into broad responsibilities and more specific dimensions and practices. Examining recurring areas across these accounts reveals common concerns with direction, people development, teaching and evaluation, and the organization of conditions and resources. It also shows that related leadership work has been defined, combined, and measured in different ways.

First-order meta-analysis synthesizes findings from primary empirical studies. Second-order meta-analysis synthesizes findings from existing meta-analyses, allowing questions to be examined across those earlier syntheses (Schmidt & Oh, 2013). The latter does not replace the primary studies or make their differences disappear. It provides a broader view of the evidence already summarized and can identify patterns and unresolved differences among reviews.

Second-order synthesis has already contributed to educational leadership research. Tan et al. (2022) synthesized 12 meta-analyses examining leadership models, practices, and different

school outcomes. Their findings drew attention both to model-level evidence and to leadership work beyond teaching and learning alone. They also distinguished relationships with teacher and organizational outcomes from those with student outcomes. H. Wu and Shen (2022) likewise synthesized 12 prior meta-analyses, focusing on principal leadership and student achievement. They found a positive overall relationship but concluded that the evidence did not adequately establish that one particular model or practice was more effective than others.

These studies demonstrate the value of examining earlier syntheses together. They also leave room for closer comparison of the leadership work represented within those findings. The need is not simply for another overall estimate or another named leadership model. It is for a clearer account of which responsibilities and more specific practices have been examined, how comparable their reported relationships are, and what the available evidence shows across meta-analyses. Differences in terminology are part of that challenge, but the substantive question remains how leadership relates to student outcomes.

This dissertation addresses that question through a second-order meta-analysis that compares leadership constructs while preserving the meanings reported by their authors. It examines evidence at broader and more specific levels and considers contextual findings where prior meta-analyses provide them. The purpose is to make the accumulated research more interpretable for researchers, educational leaders, and policymakers, while retaining the distinctions necessary to understand what the findings represent. Chapter 3 describes the procedures used to conduct that synthesis.

Chapter 3 - Methodology

The purpose of this chapter is to describe the methods used to identify, classify, compare, and synthesize existing meta-analytic evidence on educational leadership and student outcomes. This study used a second-order meta-analytic design. A first-order meta-analysis synthesizes findings from primary studies; this second-order meta-analysis synthesizes findings from existing meta-analyses, with each included meta-analysis serving as a study-level source (Cooper & Koenka, 2012; Schmidt & Oh, 2013).

The chapter describes the research design and questions, study identification and selection, data extraction and coding, evidence synthesis, quality appraisal, and methodological limitations. Appendices A, B, and C provide the detailed search records, coding rules, and construct classifications.

Research Design

Existing meta-analyses organize the accumulated leadership evidence in different ways, with variation in models, frameworks, constructs, terminology, and outcome reporting. These differences make the findings difficult to compare directly.

The study combined comparative classification with quantitative synthesis. The analysis examined relative weighted magnitude at the synthesized-dimension level (RQ2) and the higher-order domain level (RQ3), reported practice-level findings and combined estimates for sufficiently comparable recurring practices (RQ4), and examined contextual moderator evidence (RQ5). This second-order approach supports comparison across existing syntheses (Schmidt & Oh, 2013; Tan et al., 2022).

Author-reported terminology and hierarchy were preserved before researcher classification. Gaps in construct coverage, comparability, or contextual evidence were documented rather than filled with unsupported assumptions.

Research Questions

This study was guided by five research questions:

RQ1. How can leadership constructs reported in existing meta-analyses be systematically classified and organized into higher-order domains, synthesized dimensions, and practices to support meaningful cross-meta-analytic comparison?

RQ2. What is the relative weighted magnitude of the synthesized relationships between leadership dimensions and student outcomes across existing meta-analyses?

RQ3. What is the relative weighted magnitude of the synthesized relationships between higher-order leadership domains and student outcomes across existing meta-analyses?

RQ4. What practice-level relationships with student outcomes can be identified across existing meta-analyses and, where sufficiently comparable evidence is available, what is their relative weighted magnitude?

RQ5. To what extent does the meta-analytic literature provide evidence that contextual factors may moderate the relationships between leadership dimensions and student outcomes?

Table 3.1 summarizes the analytic focus and methodological output for each research question.

Table 3.1

Alignment of Research Questions, Analytic Focus, and Methodological Outputs

Research question	Analytic focus	Methodological output
RQ1: Classification and organization	Author-reported constructs and cross-study classification	Comparative organization into higher-order domains, synthesized dimensions, and practices, with unresolved cases retained.
RQ2: Synthesized Dimensions	Relative weighted magnitude of dimension-level relationships with student outcomes	Dimension-level synthesis of comparable quantitative evidence.
RQ3: Higher-order Domains	Relative weighted magnitude at the broader domain level	Domain-level synthesis where defensible source-level representation is available.
RQ4: Practices	Practice-level relationships with student outcomes	Individual practice findings plus weighted synthesis where sufficiently comparable recurring evidence is available.
RQ5: Context	Contextual moderator evidence reported in the included meta-analyses	Descriptive and comparative synthesis of available moderator evidence and gaps in coverage.

Note. Detailed coding definitions and classifications are provided in Appendices B and C.

Search Strategy and Identification of Studies

The search focused on existing quantitative meta-analyses examining educational or school leadership in relation to student outcomes. The original electronic search used ERIC, APA PsycINFO, Web of Science Core Collection, Scopus, ProQuest Dissertations & Theses, and Google Scholar. Search terms represented three central concepts: educational or school leadership, meta-analysis, and student outcomes (Cooper, 2017). Search syntax and fielding were adapted to each database. Appendix A provides the database-specific queries, limits, available dates, and record counts.

The original search was supplemented by reference-list review, backward and forward citation searching, the Visible Learning MetaX database (Corwin Visible Learning Plus, 2026),

expert referral, and targeted searches. MetaX was searched on August 5, 2026, as a supplemental identification source. Separately, John Hattie, a member of the dissertation committee, provided additional candidate records through expert referral. Those records were evaluated using the same eligibility criteria as other identified candidates and reconciled against previously identified records. The September 8, 2026, boundary/sensitivity search tested expanded terminology, removal of the English-language restriction, and the pre-2000 publication boundary; it identified no additional eligible meta-analysis. Later targeted-language searches identified candidate records, including one meta-analysis that ultimately met the eligibility criteria and was included in the final evidence base. These searches did not establish exhaustive or equal coverage across languages.

Appendix A distinguishes the original search from supplemental identification procedures. Known rediscoveries and duplicate encounters were reconciled against earlier records rather than counted as new records.

Inclusion and Exclusion Criteria

Studies were included when they met the following substantive and methodological criteria (Cooper, 2017). First, a study had to report a quantitative meta-analysis with sufficient information to interpret and synthesize at least one qualifying relationship between educational or school leadership and student outcomes. Narrative, conceptual, bibliometric, or descriptive reviews were ineligible unless they also reported qualifying quantitative meta-analytic findings. A source was not required to report every possible accompanying precision statistic.

Second, studies had to examine school-level educational leadership. Eligibility was based on leadership function rather than a principal-only job-title rule. Constructs had to be sufficiently specific to support dimension- or practice-level comparison; an overall broad approach/model

estimate alone did not qualify. Third, studies had to examine leadership in K–12 contexts. Studies focused exclusively on higher education, early childhood, or non-school organizational contexts were excluded. Mixed-population sources were evaluated for substantive K–12 relevance and usable evidence rather than automatically excluded.

Fourth, the evidence primarily concerned academic achievement. Some eligible meta-analyses combined academic and other student outcomes in estimates that could not be separated. Those estimates were retained when they met the study's student-outcome criterion. Studies reporting only teacher, organizational, or implementation outcomes without a qualifying student outcome were excluded.

Fifth, publications were not excluded on language alone when sufficient translation and source verification were available to determine eligibility, construct and outcome meaning, and necessary quantitative information. This refinement of the proposal's English-only criterion was adopted before final inclusion decisions. Sixth, studies had to be published from 2000 through 2026; underlying primary studies could predate this period.

Finally, publication type alone did not determine eligibility. Peer-reviewed publications, dissertations, and other source types could qualify when they met the same substantive and methodological criteria.

Study Selection and Screening

Following electronic identification, the original 329-record intake was deduplicated to 232 records before title and abstract screening. At this stage, the researcher excluded studies that clearly failed the eligibility criteria. Records were retained for full-text review when eligibility could not be determined from the title and abstract alone.

Full-text review applied the inclusion and exclusion criteria above. Later candidates entered at different stages: some underwent title/abstract or source screening, while others proceeded directly to full-text review or retrieval. The screening records preserved these different routes.

Screening records documented identification routes, screening decisions, full-text reviews, and reasons for exclusion. PRISMA 2020 (Page et al., 2021) was used as the reporting framework for the study-selection flow. Chapter 4 presents the flow diagram and final study-selection results; Appendix A provides the detailed search and reconciliation record.

Data Extraction and Comparative Coding

Data extraction recorded information from the included meta-analyses and their supporting source materials rather than routinely reconstructing the underlying primary studies. It preserved source terminology, structure, and reported values before researcher classifications were applied. Appendix B provides the complete variable definitions and coding rules.

First, study-level information included bibliographic details, publication type, the focus of the meta-analysis, reported primary-study and effect-size counts, participant samples where available, educational settings, and other descriptive characteristics. Second, construct-level information included author labels, definitions or strongest available descriptions, hierarchy, framework placement, and conceptual context.

Third, quantitative findings relevant to student outcomes were extracted. These included the reported effect size, effect metric, estimate-specific number of contributing studies, and available supporting statistics such as participant sample sizes, standard errors, confidence intervals, or related summary information. Reported values were preserved before any researcher transformation. The quantitative synthesis ultimately expressed eligible effects on a common

Cohen's *d* scale, with conversion procedures explained in the statistical-analysis section (Cooper, 2017; Schmidt & Oh, 2013). When reported, relationship or pathway type, including direct, indirect or mediated, mixed, or otherwise unspecified relationships, was also preserved to support source-faithful interpretation.

When meta-analyses reported multiple overlapping student outcomes for the same leadership construct, the broadest defensible eligible student-outcome estimate was retained for the main comparative analysis to preserve comparability and avoid combining overlapping estimates. Contextual information, primary-study publication-year ranges, and methodological qualifications were also recorded where reported. Contextual designations were recorded only when supported by source evidence. Methodological notes included inclusion criteria, statistical models, potential primary-study overlap, and stated limitations. Missing descriptive information was recorded as NR or left blank according to the field's coding rule.

Comparative coding proceeded in two stages (Cooper, 2017). First, the researcher recorded what each author called and meant by a construct, how it was organized within the author's framework, and what the source reported about it. This source recording preserved the author's terminology, hierarchy, and conceptual context.

Second, the researcher classified each intact construct for this study based on what it represented: its meaning, breadth, function, specificity, place in the author's framework, how it was measured, and the available source evidence. Researcher classifications distinguished dimensions, practices, and broad approach/model constructs. These classifications remained separate from assignment to researcher-defined dimensions and higher-order domains. Preserving the author's terminology did not mean accepting the author's hierarchical label as the dissertation's classification; the researcher's classification could differ from that label.

Constructs were not divided to fit the comparative structure, and unresolved or intentionally unassigned cases were documented rather than forced into it. No preexisting leadership framework was used as a fixed template for the dissertation's comparative classifications.

For example, Leithwood and Sun (2012) identified building collaborative structures as a practice within redesigning the organization. Their description included enabling staff participation in decisions about programs and instruction, establishing working conditions that support collaborative planning and professional growth, and distributing leadership among staff (pp. 399–401). Because the intact construct encompassed several related areas of leadership work rather than one specific action, this study classified it as a dimension. The original author label was preserved. Appendix B provides this and other coding examples, and Appendix C presents the complete construct-level classifications and mappings.

A corresponding approach was used for student outcomes. The author's original outcome wording was preserved, and a standardized outcome category was assigned where the source evidence supported a defensible classification. The standardized category supported comparison across studies without replacing the source terminology. Uncertainty about outcome meaning or composition was documented in the supporting records.

A structured master extraction and coding database and supporting records preserved source information and researcher classifications. A subset of included studies was reviewed for calibration; definitions and decision rules were refined when omissions or recurring ambiguities emerged, then applied across the included meta-analyses. Consistency checks and documented decision notes supported the comparative review (Cooper, 2017).

Table 3.2 summarizes the two-stage comparative coding process used to address RQ1. Appendix C provides the complete construct-level classification and analytic mapping across the 17 included meta-analyses.

Table 3.2

Analysis Process for RQ1: Classification and Grouping

Stage	Primary task	Output
1. Source recording	Record author terminology, meaning, hierarchy, framework placement, outcomes, and reported quantitative information.	Source-based record of each intact construct.
2. Comparative classification	Classify each intact author construct; compare constructs across sources and assign synthesized dimensions and higher-order domains where supported.	Researcher classifications and comparative assignments, with unresolved or intentionally unassigned cases documented.

Note. Appendix B provides the detailed coding definitions, decision rules, and examples.

Synthesis of Evidence and Statistical Analysis

Effect-Size Metric

Cohen's *d* was the common effect-size metric used for the quantitative synthesis. Estimates already reported as *d* were retained. Correlations were converted to *d* using the following equation (Borenstein et al., 2009, p. 48):

$$d = \frac{2r}{\sqrt{1 - r^2}}$$

Here, *r* is the reported correlation and *d* is the corresponding Cohen's *d* value. Fisher's *z* estimates were first converted back to correlations using the following equation (Borenstein et al., 2009, chap. 6):

$$r = tanh(z)$$

Here, *z* is the Fisher-transformed cor*r*elation, r is the recovered correlation, and tanh is the hyperbolic tangent function. The recovered *r* was then converted to *d* using the first equation.

Study-Count Weighting and Pooled Estimates

Each selected meta-analytic estimate was weighted by the estimate-specific number of primary studies contributing to it. The weight was a contributing-study count, not the number of effect sizes, participant sample size, or an inverse-variance weight. The pooled estimate was calculated as a weighted mean:

$$\overline{d}_k = \frac{\Sigma(k_i \times d_i)}{\Sigma k_i}$$

Here, d_i is the Cohen's *d* value for contributing estimate i; k_i is its estimate-specific weighting count, generally the number of contributing primary studies; and Σ indicates summation. Source-defined across-study replication units are retained with their qualification where applicable, including Witziers et al. (2003). The barred *d* with subscript *k* ($\bar{d}_k$) denotes the study-count-weighted mean effect size. $K = \Sigma k_i$ is the sum of the weighting counts used for the pooled result, not necessarily the number of unique, independent primary studies. An estimate based on more contributing studies therefore receives more weight in the weighted average.

In the results tables, *k* denotes an estimate-specific contributing-study count and *K* denotes the sum of the study-count weights entering a pooled estimate. When a source-level estimate combines several selected estimates, its weight is the sum of their contributing-study counts.

Combining Evidence Within a Meta-Analysis

When one meta-analysis supplied more than one selected construct for the same synthesized category, those estimates were first combined within that meta-analysis using the weighted-mean calculation above and their contributing-study counts. This produced one source-level contribution before the meta-analysis entered the calculation across meta-analyses. The combined contribution carried the sum of its component study-count weights. If only one

selected estimate represented the source, its effect and study-count weight were carried forward unchanged. This procedure combined different selected constructs; alternative estimates of the same construct remained subject to the study's selection rules.

Dimension, Domain, and Practice Synthesis

For RQ2, the researcher-defined dimension assignments established under RQ1 determined which eligible author-reported constructs could contribute to each dimension. A researcher-classified practice could contribute to its assigned researcher-defined dimension when quantitatively eligible. Its separate reporting under RQ4 was another view of the same evidence, not additional independent evidence.

For RQ3, domain results were calculated from source-level dimension evidence. If a meta-analysis contributed to more than one dimension within the same domain, its dimension estimates were first combined within that meta-analysis using the same study-count-weighted procedure. That meta-analysis then entered the domain calculation once, with its combined estimate and summed study-count weight. The final pooled dimension means were not averaged to create domain results.

For example, H. Wu (2020) supplied coherent curricular programs ($d = 0.409$, 5 contributing studies) and real-time and embedded instructional assessment ($d = 0.174$, 12 contributing studies). When these two dimension contributions were combined within H. Wu (2020) for the lead teaching and learning domain, the calculation was:

$$\frac{(5 \times 0.409) + (12 \times 0.174)}{5 + 12} \approx 0.243$$

H. Wu (2020) therefore entered the domain synthesis once, with a source-level estimate of approximately $d = 0.24$ and a summed study-count weight of 17. The 17 is the sum of the

contributing-study counts represented in the two estimates; it is not a verified count of 17 unique primary studies.

For RQ4, usable practice findings were reported individually. Recurring practices were pooled when sufficiently comparable findings were available from at least two different usable meta-analyses, subject to the overlap safeguards below. These practice estimates used the same study-count-weighted calculation. Findings without sufficient recurrence or comparability remained individual, nonpooled findings.

Direct, indirect, mixed, and unresolved pathway classifications were preserved and considered during interpretation. These classifications were not automatically separated into different primary pools; separation was used only when necessary to preserve a substantively defensible interpretation. More specific outcomes were retained where available for supplementary interpretation. The publication-year range of the primary studies was also retained descriptively to provide temporal context.

The second-order synthesis produced pooled Cohen's *d* estimates weighted by estimate-specific contributing-study counts. These estimates provided a quantitative comparison of observed weighted magnitude across the synthesized dimensions, higher-order domains, and recurring practices. Interpretation also considered contributing-study counts, variation among source estimates, concentration of evidence, potential overlap, and source-specific qualifications. Because comparable source-level precision and covariance information was not consistently available, second-order confidence intervals and formal tests of differences between pooled categories were not calculated.

Statistical analyses were conducted in R through the RStudio environment, with the metafor package (Viechtbauer, 2010) loaded as part of the analysis workflow. The reported

second-order pooled estimates were calculated using a custom R function implementing the contributing-study-count-weighted procedure described above, rather than a default inverse-variance meta-analytic model.

Overlapping Evidence and Sensitivity Analysis

The same primary study can appear in more than one meta-analysis (Cooper & Koenka, 2012; Tan et al., 2022). Where source information permitted assessment, many traceable review pairs showed low or absent overlap. Targeted safeguards were used where a material dependence concern was identified.

The reviews by H. Wu (2020) and H. Wu and Shen (2026) contained substantially overlapping primary-study evidence and were not entered together in the same pooled result. H. Wu (2020) was used in the primary analysis, and the H. Wu and Shen (2026) review was used in a prespecified substitution analysis. Duplicate reports of the same evidence were represented only once. Appendix D provides source-level quantitative contributions and prespecified substitution sensitivity results.

Contextual Evidence

For RQ5, the study summarized contextual subgroup and moderator evidence reported by the included meta-analyses. No new moderator analysis or meta-regression was conducted for this dissertation. A source could describe the context of its sample, report separate estimates for contextual subgroups, or formally test whether the leadership–student-outcome relationship differed across groups. Only the last provided a formal moderator or difference test; subgroup differences without a source-reported test were treated descriptively. Findings were retained at the level actually tested, so evidence concerning one author-reported construct was not generalized to an entire dimension. Coding a contextual characteristic did not establish that

usable moderator evidence was available for it. Appendix E provides the detailed contextual evidence; limited or absent evidence was not interpreted as showing that context did not matter.

Quality Appraisal: Reporting Transparency and Usability

All 17 included meta-analyses were appraised descriptively for search transparency, primary-study traceability, and quantitative usability. Search transparency concerned how clearly sources described where, when, and how studies were identified, including supplemental searches. Primary-study traceability concerned whether bibliographies, marked references, appendices, supplements, or contribution tables identified the studies or reports contributing to a synthesis or particular estimate. Incomplete or unavailable study lists were documented. Quantitative usability concerned whether interpretable effect estimates, estimate-specific study counts or counts that could be defensibly derived, and supporting statistical information permitted quantitative synthesis or descriptive reporting. Complete precision statistics were not required for an otherwise usable point estimate.

The appraisal was recorded narratively and informed interpretation of the included evidence. It was not a formal methodological-quality or risk-of-bias assessment. No numerical quality score was created, no appraisal score altered a source's weight, and no post hoc quality-based exclusion rule was applied. Reporting limitations were retained as qualifications for the relevant sources rather than combined into a quality ranking. All included sources provided sufficient quantitative information for the use made of their findings.

Limitations of the Study

This study depended on the quality, scope, and reporting of the included meta-analyses. Variation in construct definitions and breadth, leadership measures, student outcomes, reported pathways, primary-study composition, and reporting completeness constrained comparison. The

evidence primarily concerned academic achievement, although some eligible estimates combined academic and other student outcomes that could not be separated. Relationships were reported as direct, indirect, mixed, or unresolved and did not all represent the same pathway between leadership and student outcomes. Reliance on existing syntheses also prevented reconstruction of all primary-study definitions, measures, instruments, and effect estimates, leaving some ambiguities in the underlying evidence unresolved.

Primary-study overlap could reduce the independence of evidence synthesized across meta-analyses. The researcher assessed overlap where source information permitted and applied targeted safeguards where material dependence was identified. Incomplete or varying study-identification information nevertheless prevented complete independence across all underlying primary studies from being established.

The study produced pooled Cohen's *d* estimates weighted by contributing-study counts. However, the included meta-analyses did not consistently provide the precision and covariance information needed to calculate defensible second-order confidence intervals or formally test differences between pooled estimates. The numerical ordering therefore reflects observed differences in weighted magnitude rather than statistically established differences, and the associations do not establish causality. The reported *K* values represent summed weighting counts rather than deduplicated numbers of independent primary studies.

Researcher judgment was required to reconstruct author meaning, classify intact constructs, determine comparability, and organize findings across sources. Differences in terminology, hierarchy, breadth, and specificity limited the precision of grouping constructs across meta-analyses. A full independent double-coding procedure was not conducted, and other

researchers could make different defensible judgments about some comparisons or placements. Unresolved and intentionally unassigned cases limited the coverage of the comparative synthesis.

Practice and contextual evidence were less developed than the overall dimension findings. Evidence could be combined for only four recurring practices, restricting the specificity of conclusions about daily leadership activity. Conclusions about possible moderation by school level, socioeconomic context, school size, geography, and other circumstances depended on the analyses reported by the included meta-analyses rather than on a uniform set of moderator tests. Limited or absent evidence does not establish that context is unimportant or that relationships are invariant. The resulting guidance is consequently more developed for areas of leadership work than for universally applicable practices or context-specific prescriptions.

Search coverage and the age of the underlying evidence also limited the synthesis. The eligibility window for meta-analysis publication was 2000–2026, although some included sources synthesized primary studies from earlier decades. Not all results therefore describe contemporary policy and practice contexts. Publications were not excluded on language alone when sufficient translation and source verification were available, but supplemental searching did not provide equal or exhaustive multilingual coverage. Relevant evidence, including non-English meta-analyses, may remain unidentified.

The descriptive appraisal of reporting transparency and usability was not a formal risk-of-bias or methodological-quality assessment, and no formal second-order publication-bias analysis was conducted. The study consequently cannot determine the extent to which unlocated evidence, selective reporting, or weaknesses in the underlying research affected the observed pattern.

Summary

The study identified and selected eligible meta-analyses of educational leadership and student outcomes, preserved author-reported constructs and information, and comparatively classified the intact constructs for this dissertation. Eligible quantitative evidence was expressed on a common Cohen's *d* scale and weighted by contributing-study counts to synthesize findings at the dimension, domain, and, where supported, practice levels. RQ5 summarized contextual subgroup and moderator evidence reported by the included meta-analyses. Chapter 4 presents the findings from these procedures.

Chapter 4 - Results

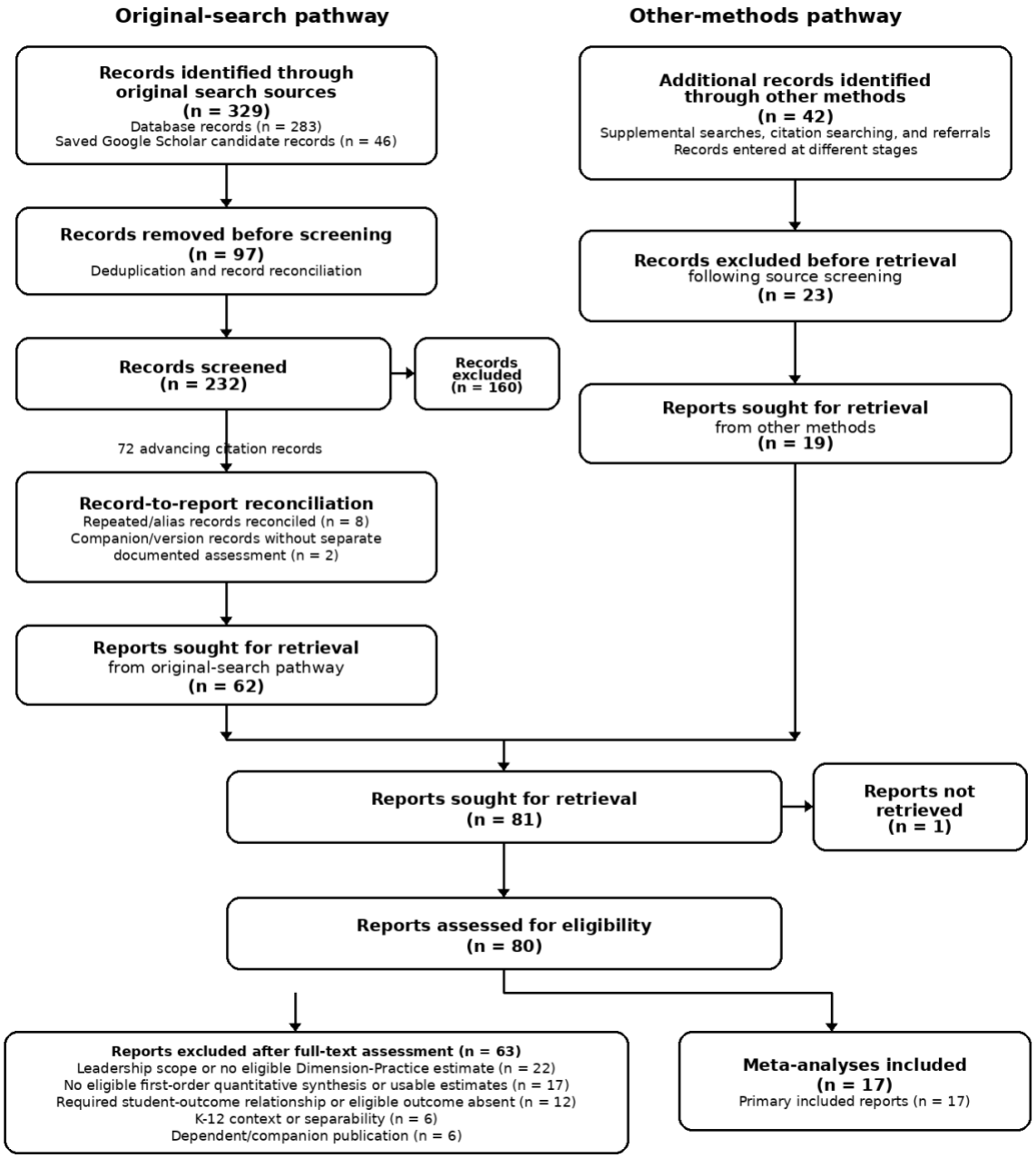
This chapter presents the results of the study. It begins with the study-selection results and characteristics of the included meta-analyses, followed by findings organized around the study's research questions.

Study Selection

Figure 4.1 summarizes study selection across the original-search and other-methods pathways. Because supplemental candidates entered the review at different stages, the pathways are shown separately until retrieval rather than as a single screening sequence. Across the two pathways, 80 reports were assessed for eligibility, and 17 meta-analyses were included. Detailed search, screening, reconciliation, and exclusion procedures are provided in Appendix A.

Figure 4.1

PRISMA 2020–Based Study Selection Flow Diagram



Note. Based on PRISMA 2020 (Page et al., 2021). The original 329-record intake was deduplicated before screening, producing a net reduction of 97 records; the 97 removals were not

retrospectively reviewed individually. Detailed search and reconciliation procedures are reported in Appendix A.

Characteristics of Included Meta-Analyses

The final evidence base contained 17 meta-analyses published from 2001 through 2026: 13 journal articles, two doctoral dissertations, one master's thesis, and one book. Source-wide primary-study counts within these meta-analyses ranged from 8 to 155. These counts should not be summed into a single total of independent primary studies because primary-study overlap and source counting conventions vary. Across the 17 included meta-analyses, 13 drew on both published and unpublished primary studies, three drew only on unpublished primary studies, and one did not report the publication composition of its primary studies. Table 4.1 summarizes the included studies.

Table 4.1

Overview of Included Meta-Analyses

Study	Leadership focus	Publication type	Primary studies reported
Brown (2001)	School leadership behaviors	Dissertation	38
Ertem (2021)	School leadership styles	Journal Article	21
Kyriakides et al. (2010)	School effectiveness factors	Journal Article	67
Leithwood & Sun (2012)	Transformational school leadership	Journal Article	79
Liebowitz & Porter (2019)	Principal behaviors	Journal Article	51
Marzano et al. (2005)	School leadership responsibilities	Book	69
Meng (2018)	Principal technology leadership	Master's thesis	10
Ozdogru et al. (2025)	Leadership types and school climate	Journal Article	90
Robinson et al. (2008)	Leadership types and practices	Journal Article	22
Scheerens et al. (2013)	School effectiveness factors	Journal Article	155

Study	Leadership focus	Publication type	Primary studies reported
Shen et al. (2020)	Teacher leadership	Journal Article	21
Tan et al. (2024)	School leadership practices	Journal Article	108
Uysal & Sarıer (2018)	School leadership styles	Journal Article	39
Witziers et al. (2003)	Educational leadership	Journal Article	37
H. Wu (2020)	Principal leadership	Dissertation	42
J.-F. Wu (2020)	Principals' instructional leadership	Journal Article	8
H. Wu & Shen (2026)	Learning-centered school leadership	Journal Article	26

Note. Studies are listed alphabetically by first author. Primary-study counts are the source-wide counts reported or adopted for each meta-analysis and are presented descriptively. Counts should not be summed across meta-analyses because primary-study overlap and source counting conventions vary.

Research Question 1: Classification and Organization of Leadership Constructs

RQ1 asked: "How can leadership constructs reported in existing meta-analyses be systematically classified and organized into higher-order domains, synthesized dimensions, and practices to support meaningful cross-meta-analytic comparison?"

The 17 meta-analyses reported 115 unique author constructs. The researcher classified 77 as dimensions, 33 as practices, and two as broad approach/model constructs; three remained unresolved. Of the 115 constructs, 104 were assigned to one of 15 dimensions within seven higher-order domains, while 11 remained unassigned, either intentionally or because their assignment was unresolved.

The study preserved what each author called and meant by a construct, classified the intact construct using the definitions in Chapter 1, and placed it in a researcher-defined

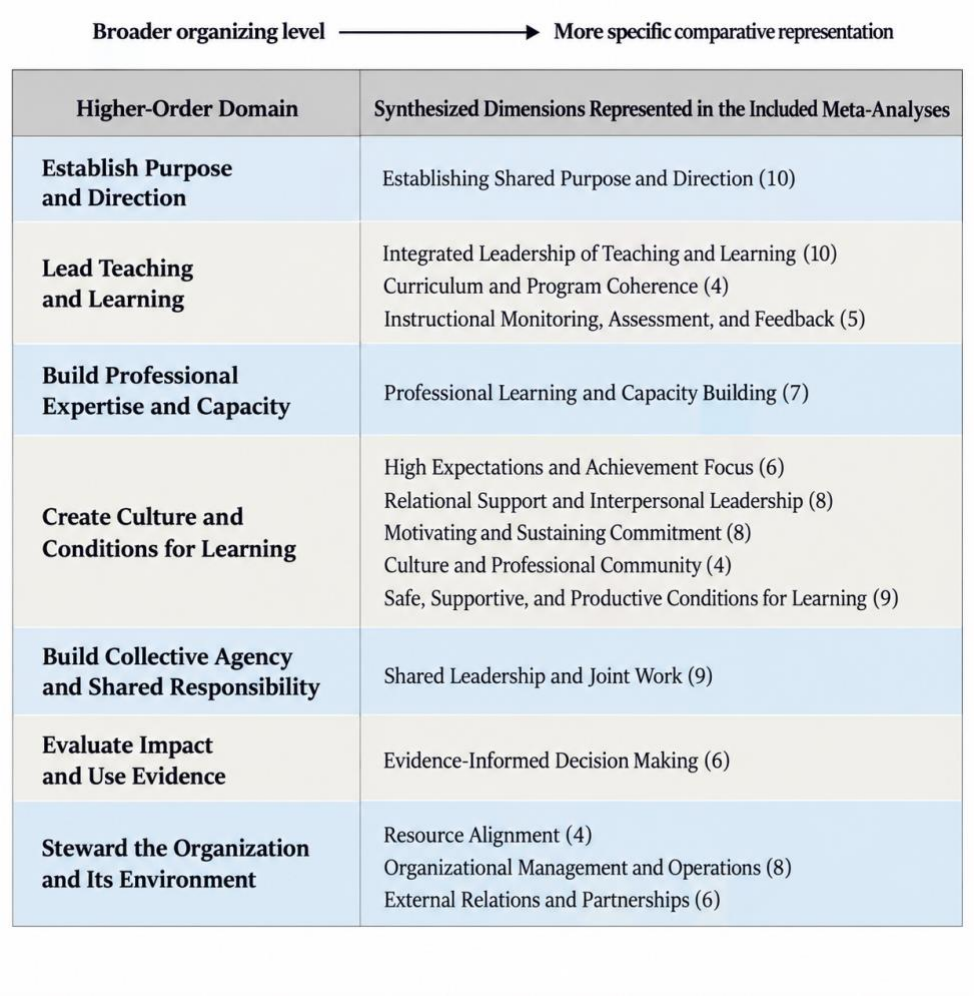
dimension and domain where appropriate for comparison. The source author's terminology, the researcher's classification, and the comparative placement were distinct parts of this process.

Table C.3 in Appendix C groups the 104 assigned author-reported constructs by synthesized dimension and higher-order domain, making the composition of each dimension visible while preserving author terminology.

Domains identify broad areas of leadership responsibility. Dimensions identify coherent areas of work within those responsibilities. Practices describe more specific activities, routines, or closely related sets of activities. The four recurring areas discussed in Chapter 2 served as themes for organizing the literature, whereas the seven researcher-defined domains presented here provide a more differentiated structure for comparing leadership work across meta-analyses. Figure 4.2 presents the seven domains and 15 dimensions used to compare leadership work across the included meta-analyses.

Figure 4.2

Seven Higher-Order Leadership Domains and Fifteen Synthesized Dimensions



Higher-Order Domain	Synthesized Dimensions Represented in the Included Meta-Analyses
Establish Purpose and Direction	Establishing Shared Purpose and Direction (10)
Lead Teaching and Learning	Integrated Leadership of Teaching and Learning (10) Curriculum and Program Coherence (4) Instructional Monitoring, Assessment, and Feedback (5)
Build Professional Expertise and Capacity	Professional Learning and Capacity Building (7)
Create Culture and Conditions for Learning	High Expectations and Achievement Focus (6) Relational Support and Interpersonal Leadership (8) Motivating and Sustaining Commitment (8) Culture and Professional Community (4) Safe, Supportive, and Productive Conditions for Learning (9)
Build Collective Agency and Shared Responsibility	Shared Leadership and Joint Work (9)
Evaluate Impact and Use Evidence	Evidence-Informed Decision Making (6)
Steward the Organization and Its Environment	Resource Alignment (4) Organizational Management and Operations (8) External Relations and Partnerships (6)

Note. The figure presents the researcher-created organization used to compare leadership constructs across meta-analyses; it does not represent a causal sequence. Parenthetical values indicate assigned author constructs. The 11 intentional or unresolved nonassignments are not shown.

Differently named constructs were grouped when they addressed sufficiently similar leadership work. For example, providing intellectual stimulation (Leithwood & Sun, 2012), promoting and participating in teacher learning and development (Robinson et al., 2008), and

providing professional development (Tan et al., 2024) were assigned to professional learning and capacity building because each concerned strengthening educators' knowledge and expertise.

Robinson et al.'s (2008) construct, planning, coordinating, and evaluating teaching and the curriculum, was retained intact in integrated leadership of teaching and learning. Its reported effect was not divided among narrower instructional functions that the authors had not estimated separately.

Visibility, reported by Witziers et al. (2003) and Marzano et al. (2005), remained a reportable practice without a dimension assignment. It could therefore inform the practice findings without being forced into a broader category.

The 11 nonassignments comprised six intentionally unassigned practices, three unresolved constructs (teacher empowerment, autonomy, and differentiation), and two distributed leadership constructs classified as broad approach/model. Appendices B and C provide the definitions and complete construct mapping. Table C.2 in Appendix C explains why some constructs classified in RQ1 did not contribute to the primary dimension and domain analyses.

Research Question 2: Relationships Between Synthesized Dimensions and Student Outcomes

RQ2 asked: "What is the relative weighted magnitude of the synthesized relationships between leadership dimensions and student outcomes across existing meta-analyses?"

Appendix D provides the source contributions underlying the quantitative findings. The results are study-count-weighted second-order Cohen's *d* estimates. "Contributing meta-analyses" is the number of distinct source meta-analyses entering a result. *K* is the total weighting count used in the calculation, not a deduplicated number of unique primary studies.

Table 4.2 orders the 15 dimension results from highest to lowest using the unrounded estimates; displayed ties retain that order. A prespecified substitution analysis was also conducted; complete results are reported in Table D.4 in Appendix D.

Table 4.2

Relationships Between Synthesized Leadership Dimensions and Student Outcomes

Synthesized dimension	*d*	Contributing meta-analyses	*K*
Evidence-Informed Decision Making	0.57	4	53
Resource Alignment	0.48	4	45
Culture and Professional Community	0.44	3	34
Professional Learning and Capacity Building	0.43	7	79
Establishing Shared Purpose and Direction	0.43	9	156
External Relations and Partnerships	0.39	5	55
Relational Support and Interpersonal Leadership	0.38	7	65
Shared Leadership and Joint Work	0.36	7	115
Integrated Leadership of Teaching and Learning	0.36	8	151
Safe, Supportive, and Productive Conditions for Learning	0.35	7	129
Curriculum and Program Coherence	0.31	3	38
Motivating and Sustaining Commitment	0.29	5	89
High Expectations and Achievement Focus	0.29	5	82
Organizational Management and Operations	0.23	7	71
Instructional Monitoring, Assessment, and Feedback	0.14	3	61

Note. *d* values are displayed to two decimal places; row order uses the unrounded estimates. *K* is the sum of the estimate-specific weighting counts used in each pooled result, not a deduplicated count of unique primary studies.

All 15 dimension estimates were positive and ranged from approximately $d = 0.14$ to $d = 0.57$. Evidence-informed decision making had the largest observed association ($d = 0.57$), followed by resource alignment (0.48), culture and professional community (0.44), professional learning and capacity building (0.43), and establishing shared purpose and direction (0.43). These comparatively larger estimates concerned using evidence, aligning resources, sustaining professional community, developing expertise, and establishing shared direction. External relations and partnerships ($d = 0.39$), relational support and interpersonal leadership (0.38), shared leadership and joint work (0.36), integrated leadership of teaching and learning (0.36), and safe, supportive, and productive conditions for learning (0.35) formed a middle group of positive estimates.

The remaining dimensions distinguished more specific areas of leadership work. Curriculum and program coherence ($d = 0.31$) concerned coordinating the educational program. Motivating and sustaining commitment and high expectations and achievement focus both had displayed estimates of $d = 0.29$, distinguishing sustained commitment from achievement expectations. Organizational management and operations ($d = 0.23$) concerned the organization of school work, while instructional monitoring, assessment, and feedback ($d = 0.14$) concerned observing progress and using assessment and feedback. These were positive associations across different functions of leadership.

Research Question 3: Relationships Between Higher-Order Leadership Domains and Student Outcomes

RQ3 asked: "What is the relative weighted magnitude of the synthesized relationships between higher-order leadership domains and student outcomes across existing meta-analyses?" Table 4.3 presents the domain results from highest to lowest using the unrounded estimates.

Table 4.3

Relationships Between Higher-Order Leadership Domains and Student Outcomes

Higher-order domain	*d*	*Contributing meta-analyses*	*K*
Evaluate Impact and Use Evidence	0.57	4	53
Build Professional Expertise and Capacity	0.43	7	79
Establish Purpose and Direction	0.43	9	156
Build Collective Agency and Shared Responsibility	0.36	7	115
Steward the Organization and Its Environment	0.35	9	171
Create Culture and Conditions for Learning	0.33	15	399
Lead Teaching and Learning	0.30	10	250

Note. d values are displayed to two decimal places; row order uses the unrounded estimates. *K* is the sum of the estimate-specific weighting counts used in each pooled result, not a deduplicated count of unique primary studies.

All seven domain estimates were positive and ranged from approximately $d = 0.30$ to $d = 0.57$. Evaluate impact and use evidence had the largest observed estimate ($d = 0.57$), followed by build professional expertise and capacity (0.43) and establish purpose and direction (0.43). Build collective agency and shared responsibility had an estimate of 0.36. The three multi-dimension domains ranged from approximately 0.30 to 0.35: steward the organization and its environment (0.35), create culture and conditions for learning (0.33), and lead teaching and learning (0.30).

Four domains had quantitative evidence representing only one dimension: evaluate impact and use evidence; build professional expertise and capacity; establish purpose and

direction; and build collective agency and shared responsibility. For these domains, the domain estimate was identical to the corresponding dimension estimate because both were calculated from the same evidence. The domain result therefore did not provide an additional, independent finding.

The other three domains included quantitative evidence from multiple dimensions. When a meta-analysis contributed estimates from more than one dimension within a domain, those estimates were first combined using their contributing-study counts so that the meta-analysis contributed one result to the domain calculation. These source-level results were then combined across meta-analyses to produce the final domain estimate. The domain estimates were not calculated by averaging the final dimension estimates reported in Table 4.2. Table D.2 in Appendix D provides the underlying contributions.

Research Question 4: Practice-Level Relationships With Student Outcomes

RQ4 asked: "What practice-level relationships with student outcomes can be identified across existing meta-analyses and, where sufficiently comparable evidence is available, what is their relative weighted magnitude?"

All 33 practices with usable quantitative evidence were retained. Eight author-reported constructs were combined to produce four recurring-practice estimates; 25 practices remained individual nonpooled quantitative findings. An individual finding could itself summarize several primary studies. Some practices also contributed to the corresponding dimension, so separate practice and dimension reporting could present two views of the same evidence.

Table 4.4 presents the four recurring practice results from highest to lowest. Each was supported by two contributing meta-analyses.

Table 4.4

Relationships Between Recurring Leadership Practices and Student Outcomes

Recurring practice	*d*	*Contributing meta-analyses*	*K*
Setting and sustaining school goals	0.48	2	50
Contingent recognition and reward	0.45	2	10
Visible and accessible leadership contact	0.36	2	16
Intellectual stimulation for professional inquiry	0.23	2	12

Note. d values are displayed to two decimal places; row order uses the unrounded estimates. *K* is the sum of the estimate-specific weighting counts used in each pooled result, not a deduplicated count of unique primary studies.

All four recurring practice estimates were positive. Setting and sustaining school goals had the largest observed association ($d = 0.48$), followed by contingent recognition and reward (0.45), visible and accessible leadership contact (0.36), and intellectual stimulation for professional inquiry (0.23).

Table 4.5 presents the 25 individual nonpooled practice findings from highest to lowest using their unrounded *d* values. Exact ties are ordered by author-year and then construct label. The table retains the original author-reported practice labels and estimate-specific weighting counts.

Table 4.5

Individual Nonpooled Practice-Level Relationships With Student Outcomes

Study	Author-reported practice	*d*	*k*
Marzano et al. (2005)	Flexibility	0.58	6
Marzano et al. (2005)	Discipline	0.56	12
Marzano et al. (2005)	Monitoring/Evaluating	0.56	31
Marzano et al. (2005)	Outreach	0.56	14
Marzano et al. (2005)	Change Agent	0.52	6
Marzano et al. (2005)	Input	0.52	16
Marzano et al. (2005)	Order	0.52	17

Study	Author-reported practice	*d*	*k*
Marzano et al. (2005)	Resources	0.52	17
Marzano et al. (2005)	Communication	0.47	11
Marzano et al. (2005)	Ideals/Beliefs	0.45	7
Marzano et al. (2005)	Involvement in Curriculum, Instruction, and Assessment	0.41	23
Marzano et al. (2005)	Optimizer	0.41	17
Marzano et al. (2005)	Affirmation	0.39	6
Marzano et al. (2005)	Relationships	0.37	11
Leithwood & Sun (2012)	Providing individualized support	0.30	6
Kyriakides et al. (2010)	Evaluation of policy on teaching	0.26	6
Leithwood & Sun (2012)	Holding high performance expectations	0.16	7
Leithwood & Sun (2012)	Modeling behavior	0.16	7
Witziers et al. (2003)	Monitoring	0.14	5
Scheerens et al. (2013)	Monitoring	0.12	43
Witziers et al. (2003)	Achievement orientation	0.04	13
Witziers et al. (2003)	Advice and support	0.04	11
Witziers et al. (2003)	Coordinating and managing curriculum	0.04	10
Witziers et al. (2003)	Supervision and evaluation	0.04	32
Leithwood & Sun (2012)	Management by exception	−0.10	1

Note. d is the common-metric Cohen's *d* value, displayed to two decimal places. *Lowercase k* is the estimate-specific source weighting count, including source-defined replication units where applicable.

The individual findings covered a range of specific leadership activities. Marzano et al.'s (2005) flexibility had the largest observed estimate ($d = 0.58$); discipline, monitoring/evaluating, and outreach each had displayed estimates of 0.56. The findings also included Leithwood and Sun's (2012) management by exception ($d = -0.10$). The author labels preserve the distinct work described by each source.

Research Question 5: Contextual Evidence

RQ5 asked: "To what extent does the meta-analytic literature provide evidence that contextual factors may moderate the relationships between leadership dimensions and student outcomes?"

The available meta-analytic evidence suggested that context may matter, but it was too uneven, sparse, and inconsistently tied to specific dimensions to support dependable cross-study patterns. RQ5 therefore examines what the included meta-analytic literature reports about variation in leadership relationships across contextual conditions.

The contextual synthesis covered all 17 included meta-analyses and retained 80 active contextual finding records. Thirteen sources provided usable contextual analyses, two reported mixed-outcome contextual tests whose student-outcome component could not be separated, and two described context without a relevant contextual analysis. The 80 records represented the reported evidence captured within these sources, not 80 independent demonstrations of moderation. The study-level contextual inventory and dimension-level evidence summary are provided in Appendix E.

RQ5 distinguished descriptions of sample context, subgroup estimates, and formal moderator tests. Subgroup contrasts were treated descriptively unless the source reported a difference test; findings were interpreted at the level of the construct tested.

The standardized contextual characteristics coded across the extraction database, where data were sufficient, were school level, socioeconomic context, geography, and school setting. The contextual categories distinguished different features of the settings represented in the included meta-analyses. School level referred to whether evidence came from primary, secondary, or mixed grade levels. Socioeconomic context concerned reported differences in

socioeconomic status or poverty. Geography referred to country or regional location, whereas school setting distinguished urban, suburban, rural, or mixed settings. The contextual moderator synthesis also retained school size, school governance or sector, and other source-reported contextual characteristics when included meta-analyses examined them. School size concerned enrollment or source-defined size groupings, and school governance or sector included distinctions such as public, private, or religious schools.

Table 4.6 summarizes the numbers of sources reporting formal tests and the findings for the seven contextual categories. The counts describe where formal tests were reported, not how often moderation was established.

Table 4.6

Contextual Moderator Evidence Across Included Meta-Analyses

Contextual factor	Meta-analyses with formal tests	Dimension-specific evidence	Conservative synthesis conclusion
School level	12	4	Mixed and source/construct-specific; no universally favorable school level.
SES / poverty	2	0	Rarely tested; no recurring substantive conclusion can be drawn.
School size	0	0	No usable student-outcome moderator evidence located.
School setting	3	1	Source- and pathway-specific; no universal urban/rural/suburban conclusion.
Geography / country / region	6	3	Some reported variation, but no consistent cross-construct or universal cultural direction is defensible.
School governance / sector	0	0	No usable student-outcome moderator evidence located.

Contextual factor	Meta-analyses with formal tests	Dimension-specific evidence	Conservative synthesis conclusion
Other contextual moderators	2	0	Sparse and heterogeneous; no general conclusion across moderators.

Note. Counts indicate the number of included meta-analyses reporting relevant evidence, not independent moderator replications. School level also had subgroup-only evidence from one additional source without a formal difference test. Dimension-specific counts identify formal-test sources with source-construct/context evidence linked to a current dimension; they do not establish moderation of the entire dimension. SES = socioeconomic status.

School level, such as primary (elementary) versus secondary schooling, was the most frequently tested contextual category. Twelve meta-analyses reported formal tests, and one additional source reported subgroup estimates without a formal difference test. Four of the formal-test sources provided findings linked to particular constructs assigned to dimensions. For example, Witziers et al. (2003) reported smaller secondary-school associations for achievement orientation and supervision and evaluation, whereas H. Wu and Shen (2026) did not find statistically significant grade differences for the corresponding expectations and assessment constructs. The source-specific findings in Appendix E do not identify a universally favorable school level.

Only two sources tested socioeconomic status and poverty, and neither provided dimension-specific evidence. These findings leave variation across socioeconomic contexts unresolved.

School-size tests concerned broader school-effectiveness outcomes rather than a separable student-outcome relationship. The retained evidence therefore did not establish whether school size moderated leadership relationships with student outcomes.

School setting was examined through formal tests in three sources, with dimension-specific evidence from only one. Findings were source- and pathway-specific rather than consistent across the included literature. Selected comparisons also combined rural and suburban schools, limiting distinctions between those settings. For example, H. Wu and Shen (2026) reported larger associations in combined rural/suburban settings than in urban settings for real-time and embedded instructional assessment in both direct and indirect pathways (see Appendix E).

Geography, country, or region was formally tested in six sources, three of which provided dimension-specific evidence. Some sources reported national or regional variation, but the directions differed across constructs and comparison groups. Witziers et al. (2003), for example, reported smaller associations outside the United States for defining and communicating mission but larger associations for achievement orientation and supervision and evaluation. Kyriakides et al. (2010) reported negative Netherlands and positive Asian coefficients for school climate. These construct-specific findings, detailed in Appendix E, did not establish a single geographic pattern.

No usable student-outcome moderator evidence was located for school governance or sector. Descriptions or analyses distinguishing public, private, or religious schools, and contextual tests involving school conditions or other outcomes, were not treated as evidence of moderation of leadership–student outcome relationships.

Other contextual moderators were examined in two sources, Tan et al. (2024) and Marzano et al. (2005). These analyses addressed different contextual characteristics, including ethnicity and school-performance context (see Appendix E).

Evidence about context could also be linked to particular author-reported constructs assigned to dimensions. No dimension had such evidence from more than three meta-analyses. High expectations and achievement focus and safe, supportive, and productive conditions for learning each had evidence from three sources. Integrated leadership of teaching and learning; instructional monitoring, assessment, and feedback; and shared leadership and joint work each had evidence from two sources.

These counts included both formal moderator tests and subgroup estimates. For integrated leadership of teaching and learning, for example, one source provided a formal test and the other reported subgroups without testing their difference.

No construct-specific contextual evidence was located for professional learning and capacity building, culture and professional community, or resource alignment. Most other dimensions had evidence from only one source.

School level was the most frequently tested contextual category, but school setting and geography also yielded source-specific findings. Across the seven contextual categories, the evidence did not establish a single pattern that applied across leadership work. Descriptions of context were more common than usable tests.

Chapter Summary

The 17 included meta-analyses reported 115 author constructs, of which 104 were assigned to 15 dimensions within seven domains. Practice findings were reported separately under RQ4.

All 15 dimension estimates were positive, ranging from approximately $d = 0.14$ to $d = 0.57$. All seven domain estimates were also positive, ranging from approximately $d = 0.30$ to $d = 0.57$.

Four recurring practices produced positive combined estimates, and 25 additional practices were reported individually. School level was the most frequently tested contextual category, while school setting, geography, and other contextual evidence remained source-specific. The contextual findings did not establish a single universal pattern across leadership work. Chapter 5 considers the implications and directions for future research.

Chapter 5 - Discussion

Introduction

School leaders are expected to improve teaching and learning while sustaining the people, relationships, and organizational conditions on which that work depends. The practical problem addressed in this study was how to determine which areas of leadership work warrant attention within these broad responsibilities. Existing meta-analyses provided substantial evidence, but their findings were organized around different constructs, measures, and conceptions of leadership. An estimate for a whole leadership approach did not necessarily show which work within that approach was most closely associated with student outcomes. Even more specific findings were difficult to compare when similar activities appeared under different names or were combined with different responsibilities.

The literature review traced the development of instructional, transformational, and distributed leadership and the increasing attention to recurring areas of leadership work. Those approaches contributed important explanations of direction, professional development, influence, instruction, and organizational conditions. Their development also exposed a need for greater specificity. This dissertation addressed that need through a second-order synthesis of 17 included meta-analyses, bringing differently organized evidence into a more coherent account of seven domains, 15 dimensions, and reportable practices. The synthesis makes it possible to examine both the breadth of leadership responsibility and meaningful distinctions within it.

This chapter argues that the findings direct particular attention to how principals interpret evidence, establish shared educational purpose, develop professional expertise and community, and align resources with learning priorities. These areas belong in a connected account of leadership rather than a collection of competing priorities. The discussion develops a proposed

model of four interconnected areas of leadership work centered on student learning, with evidence-informed diagnosis and evaluation throughout. It then considers what the findings mean for the daily work of principals, leadership development, and system support, followed by suggestions for further research.

Interpretation of Findings

The literature reviewed in Chapter 2 supplied several ways to understand leadership, from broad approaches to frameworks describing recurring work. Hitt and Tucker (2016), for example, identified common leadership practices across differently organized frameworks, while Leithwood and Sun (2012) called for greater attention to specific practices within and across leadership models. The present study adds a comparative synthesis of the relationships reported across included meta-analyses. Its contribution is both a clearer organization of the accumulated evidence and a differentiated account of the associations within it. Prior literature helps explain the work represented by these findings; the dissertation's results provide the focus for the interpretation that follows.

The researcher brought more than two decades of experience in K–12 education and educational leadership, including work as a teacher, instructional coach, principal, executive director, and assistant superintendent. His district-level leadership experience included work in rural, suburban, and urban settings, where he oversaw educational programs and personnel and supported principals and teachers in improving student learning. He subsequently coached and worked with educators and leadership teams across the United States and internationally, gaining exposure to varied school systems and perspectives. This background informed the practical perspective he brought to interpreting the study's findings. Because professional experience can

also shape interpretation, the discussion remains grounded in the source-reported evidence, documented coding decisions, and quantitative findings of the study.

What the Dimension Findings Show

All 15 dimension estimates were positive. The largest observed associations were evidence-informed decision making ($d = 0.57$), resource alignment ($d = 0.48$), culture and professional community ($d = 0.44$), professional learning and capacity building ($d = 0.43$), and establishing shared purpose and direction ($d = 0.43$). The smallest observed associations were instructional monitoring, assessment, and feedback ($d = 0.14$), organizational management and operations ($d = 0.23$), motivating and sustaining commitment ($d = 0.29$), and high expectations and achievement focus ($d = 0.29$).

The substantive pattern brings educational judgment and the development of collective capability to the foreground. The comparatively larger relationships concern understanding conditions, deciding what the school is trying to accomplish, developing the expertise and professional relationships needed for that work, and directing resources toward it. They suggest that the principal's responsibility extends beyond ensuring that activities occur. It includes connecting those activities with an educational purpose and examining whether the resulting work advances learning. A goal, professional-learning opportunity, or resource decision becomes meaningful through the work it organizes and the learning it is intended to support.

The findings also show why several familiar leadership expectations require more precise interpretation. Monitoring, dependable operations, high expectations, and sustained effort remain necessary parts of school leadership. Their smaller observed estimates do not make them unimportant. Instead, the pattern raises questions about how they are connected to diagnosis, professional capability, shared purpose, and action. Monitoring can identify a concern without

supplying the expertise needed to address it. Expectations can name an ambitious standard without establishing a shared understanding of how the school will pursue it. Efficient operations can maintain a school without directing its resources toward its most pressing educational need.

The breadth of evidence differed among the leading dimensions. Establishing shared purpose and direction drew on nine contributing meta-analyses, while professional learning and capacity building drew on seven. Evidence-informed decision making and resource alignment each drew on four contributing meta-analyses, and culture and professional community drew on three. Thus, the largest observed estimate and the broadest source coverage were different features of the findings. Both deserve attention: evidence use and resource alignment warrant substantive examination, while the wider representation of shared purpose and professional learning gives those areas a prominent place in the accumulated literature. Together, the findings support interpreting leadership through the relationship between educational direction and the school's capacity to act on it.

Key Contrasts in Principal Leadership

The distinction between evidence-informed judgment and narrow monitoring is especially useful. Evidence-informed decision making concerns diagnosis, interpretation, evaluation, and decisions across school priorities. Instructional monitoring, assessment, and feedback concerns the more specific examination of teaching and student learning and the instructional responses that examination warrants. Their observed estimates, $d = 0.57$ and $d = 0.14$, respectively, draw attention to the distinction between broader evidence-informed leadership decisions and the use of instructional evidence to guide feedback and response. A principal can receive assessment reports, observe lessons, and review progress without yet identifying why a problem persists or what response is appropriate.

For principals, the central responsibility is to turn evidence into informed action. This requires knowing the school well enough to recognize emerging problems, question assumptions, and connect patterns in student learning with teaching, professional expertise, culture, and resources. Evidence use becomes consequential when principals use it to decide what needs to change, mobilize a response, and evaluate whether that response improves learning. The defining question is therefore not "What data have we collected?" but "What have we learned about our impact, and what will we do next?"

Hattie's (2015) account of impact gives this interpretation a clear educational purpose. He asks whether the intended outcomes are worthwhile, who benefits, and what evidence would justify continuing or changing an approach. He also connects examination of impact with shared understandings of success and attention to implementation. Applied to the present findings, this perspective places evaluation within leadership decisions throughout the school. It asks principals and colleagues to establish what they hope to accomplish, consider whether their actions address that purpose, and use evidence to revise their work. Broader evidence-informed judgment connects instructional monitoring and feedback with decisions about educational priorities and the support needed to pursue them.

A similar distinction separates purposeful resource alignment from routine operations. Resource alignment ($d = 0.48$) concerns directing time, staffing, expertise, money, infrastructure, and support toward educational priorities. Organizational management and operations ($d = 0.23$) concerns the systems and routines through which the school functions. Dependable operations are essential, but functioning smoothly does not necessarily mean that resources are serving the school's most important educational priorities. The distinction is apparent when a timetable is efficient yet leaves no opportunity for teachers to examine a shared instructional problem, or

when professional-learning funds are spent without a clear connection to the capability the school needs to develop.

Robinson et al. (2008) described strategic resourcing in relation to teaching goals and the expertise required to pursue them. This account clarifies part of the evidence contributing to the present resource alignment result. Leithwood (2012) likewise located resource allocation in relation to a school's vision and goals. The practical interpretation is that purposeful allocation gives administrative decisions their educational direction. A principal needs to ask both whether a system works dependably and whether it directs available support toward the intended learning priority. These are complementary questions, with different implications for the decisions that follow.

Professional learning and capacity building ($d = 0.43$) provides another necessary connection. Compared with the smaller observed association for instructional monitoring, assessment, and feedback, it directs attention to developing educators' knowledge, judgment, expertise, inquiry, and collective capability. Principals cannot monitor their way to instructional improvement. Examination of practice must connect with the professional learning required to improve that practice. Identifying that students struggle with a particular concept does not establish that teachers have access to the subject knowledge, instructional alternatives, or opportunities for supported application needed to respond.

The literature review gives substance to this distinction. Robinson et al. (2008) emphasized promoting and participating in teacher learning and development, while Leithwood and Sun (2012) included intellectual stimulation and individualized support within developing people. Robinson and Gray (2019) further distinguished the quality of leadership activity from its frequency and connected professional interaction with teacher learning and classroom

application. Taken together, these accounts clarify why arranging an event or documenting participation is an incomplete description of capacity building. The relevant leadership work concerns what educators learn, how they examine and apply that learning, and what support makes its use possible.

Professional community and interpersonal relationships add a further distinction. Culture and professional community ($d = 0.44$) and relational support and interpersonal leadership ($d = 0.38$) had larger observed associations than motivating and sustaining commitment ($d = 0.29$). Attending to an individual's needs, building trust and shared professional norms, creating substantive professional exchange, and encouraging continued effort are related activities, but they serve different purposes. An educator may need personal support to address a difficulty. A staff may need opportunities to examine practice openly and learn from disagreement. Recognition of effort does not, by itself, establish either condition.

Wahlstrom and Louis (2008) examined professional community, trust, shared leadership, and teachers' reported instructional practices. Their study helps distinguish the substance of adult relationships and professional exchange. The present findings similarly support looking beyond the general description of a positive or motivated staff. Encouragement and recognition matter, but they do not substitute for relationships in which educators can ask for help, examine evidence, and improve their work together. A principal's response should therefore reflect whether the concern involves confidence and persistence, individual support, or the norms and relationships of the professional community.

Shared leadership and joint work ($d = 0.36$) adds the question of influence and responsibility. Encouraging people to continue an effort is different from giving them meaningful participation in the decisions that shape it. Diamond and Spillane's (2016)

distributed perspective directs attention to interactions among people and the circumstances of their work, rather than simply the number of people holding leadership titles. This helps explain the distinction between delegation and shared work. A team may have assigned tasks while its expertise has little influence on the selected response. Principals need to connect participation with purpose, responsibility, and the use of professional knowledge, alongside the support and encouragement that sustain the effort.

Shared purpose, expectations, and motivation are also distinct. Establishing shared purpose and direction ($d = 0.43$) concerns identifying an educational direction and building collective ownership of it. High expectations and achievement focus concerns the standard being pursued, while motivating and sustaining commitment concerns continued effort toward the goal; both had estimates of $d = 0.29$. These findings give greater precision to work sometimes described generally as vision. A school may communicate demanding expectations without a common understanding of its priorities. It may also have committed staff whose efforts are dispersed across competing initiatives. Leithwood and Sun's (2012) treatment of vision, goal consensus, and expectations helps clarify the content of these distinctions. The principal's work is to connect the purpose, standard, and sustained effort without assuming that one supplies the others.

The instructional dimensions show why this more specific account is also needed within teaching and learning. Integrated leadership of teaching and learning ($d = 0.36$) addresses the instructional program as connected work. Curriculum and program coherence ($d = 0.31$) concerns how learning opportunities fit together. Instructional monitoring, assessment, and feedback ($d = 0.14$) concerns what is happening in teaching and learning and how instruction should respond. Hallinger and Murphy (1985) distinguished supervision and evaluation,

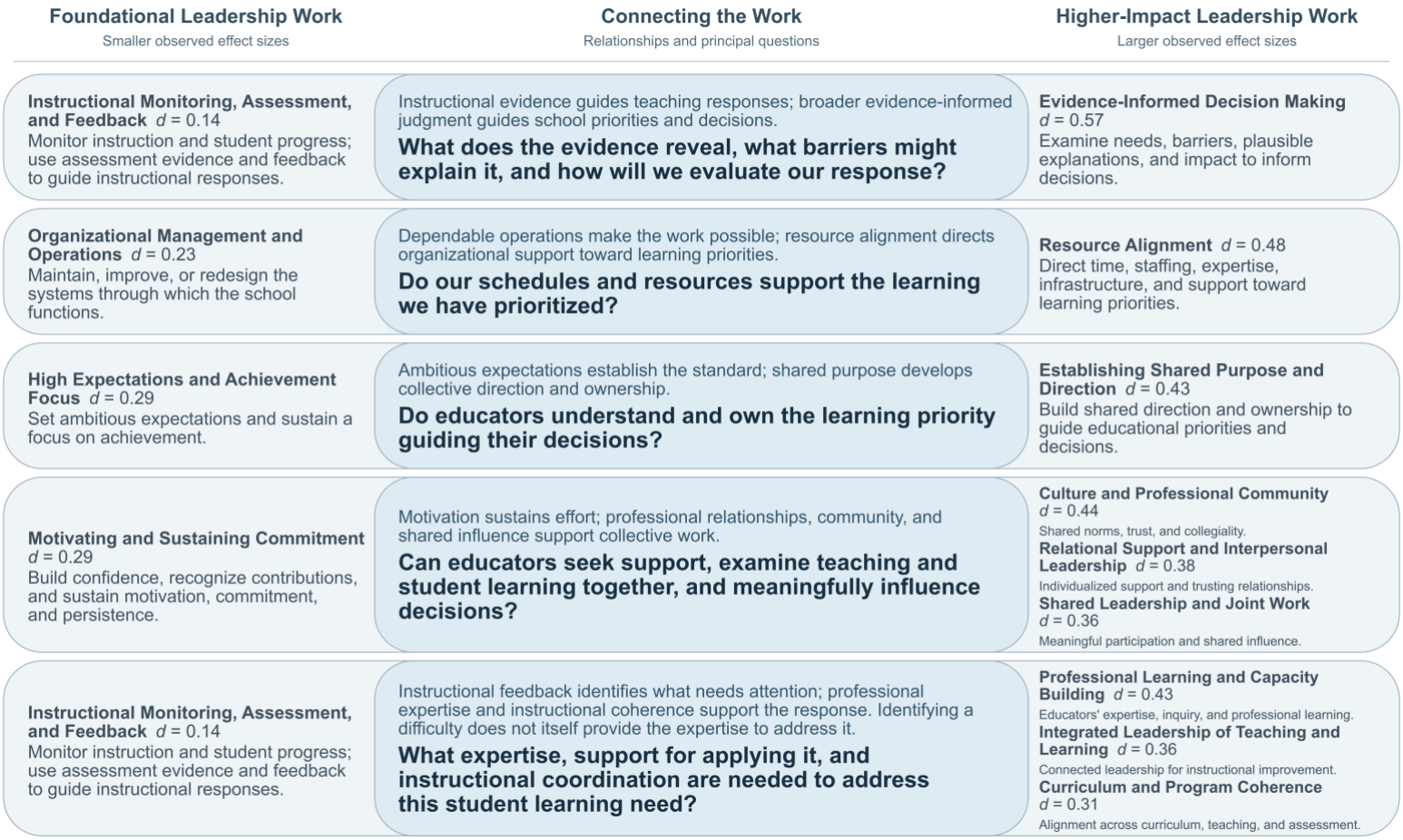
curriculum coordination, and monitoring student progress within instructional management. Robinson and Gray (2019) likewise considered coherence within and across year levels. These distinctions help a principal determine whether an instructional concern calls for coordination of the program, examination of a learning progression, or feedback and response to current classroom evidence.

The contrasts therefore lead to a connected interpretation of leadership. The principal's task is to identify what a particular need requires and bring the relevant work together in purposeful action for student learning.

Figure 5.1 brings together five of these connections and frames each as a practical question principals can use when considering how to respond to a student learning need.

Figure 5.1

Five Research-Informed Connections for Leadership Practice



Note. The five connections illustrate the researcher's interpretation of how selected leadership dimensions may complement one another in practice. Effect sizes represent individual dimension estimates (Table 4.2), not the connections illustrated.

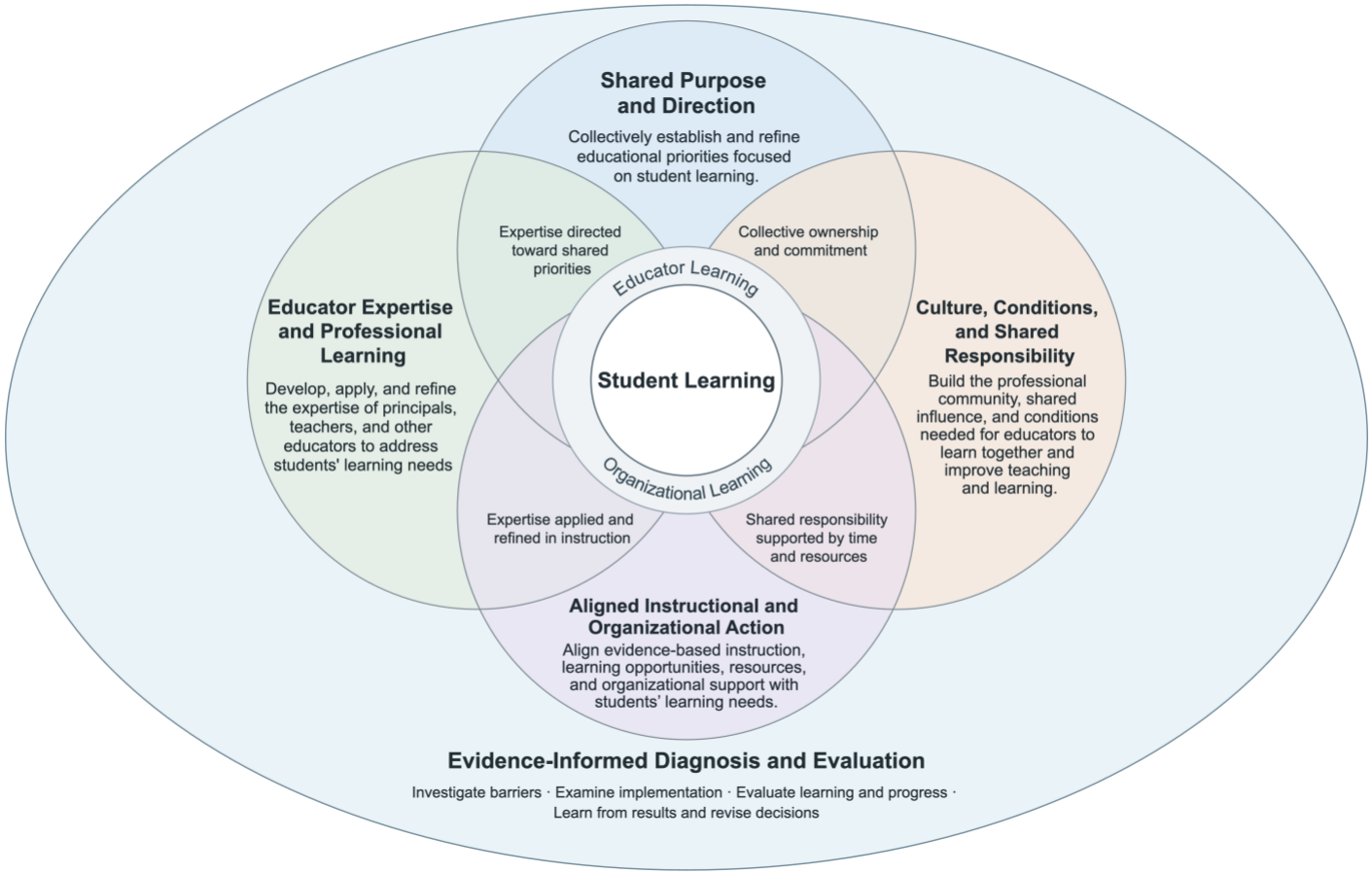
The Learning-Driven Leadership Model

Figure 5.1 illustrates selected ways that distinct leadership dimensions may complement one another in practice. The proposed Learning-Driven Leadership Model extends this interpretation by bringing leadership work together in four interconnected areas: shared purpose and direction; educator expertise and professional learning; culture, conditions, and shared responsibility; and aligned instructional and organizational action (Figure 5.2). Student learning remains the model's primary purpose; educator and organizational learning support that purpose as evidence-informed diagnosis, decision making, and evaluation guide work across all four areas. The model builds on the connections illustrated in Figure 5.1 while drawing more broadly on the study's domain, dimension, and practice findings. The four areas connect culture with collective agency and instructional leadership with organizational stewardship, rather than reproduce the study's seven domains and 15 dimensions.

The model's central proposition is that leadership involves more than attending to each responsibility separately. Shared priorities, professional knowledge, collective responsibility, and instructional and organizational support must be connected in ways that respond to students' learning needs. These responsibilities can inform and reinforce one another as principals and colleagues examine evidence, make decisions, and organize their work. A learning priority may require reconsideration when new evidence reveals an overlooked barrier. Professional learning may lead to changes in instructional practice, while examining the implementation of those changes may reveal a need for different resources or additional expertise. The model therefore emphasizes the purposeful coordination and continuing examination of leadership work rather than movement through a prescribed cycle.

Figure 5.2

The Learning-Driven Leadership Model



Note. The model illustrates the researcher's interpretation of interconnected leadership responsibilities centered on student learning. Overlaps depict selected connections, with evidence-informed diagnosis and evaluation operating throughout. The proposed model was not empirically tested in this study.

Shared purpose and direction concerns a collectively understood and owned educational direction. It connects broader educational commitments with specific learning priorities developed and refined through examination of evidence. This requires more than agreement with a general aspiration. A priority must identify the learning being pursued, why it matters, and what meaningful progress would look like—not simply the level of achievement the school hopes students will attain. Colleagues need to understand it sufficiently to use it in their decisions about teaching, learning, and school organization. Shared purpose also provides a basis for examining competing demands. When a proposed activity cannot be connected to the priority or another essential responsibility, the principal and colleagues have grounds for reconsidering its place in their work. Purpose helps direct attention toward what matters, while diagnosis and evaluation help determine whether the priority adequately reflects students' learning needs and should be refined.

Educator expertise and professional learning concerns the knowledge, judgment, and capability needed to respond to students' learning needs. This responsibility includes the continued learning of principals as well as teachers, instructional coaches, specialists, and other educators. Principals need sufficient knowledge to make informed educational judgments, recognize when additional expertise is necessary, and participate meaningfully in professional inquiry. They also have responsibility for developing expertise with colleagues and making it available where it is needed. Professional learning should connect with the identified educational need and provide opportunities to examine, apply, and refine relevant knowledge. A school needs knowledge of what to do and opportunities to learn how to do it. The connection with instructional action is particularly important: developing expertise should inform what happens

in teaching and learning, while examining that work can reveal where further professional learning is needed.

Culture, conditions, and shared responsibility concerns the professional community, relationships, expectations, and participation through which educators pursue educational priorities together. The findings distinguish professional norms and trust, interpersonal support, sustained commitment, shared influence, and safe and productive conditions for learning. These responsibilities are related but not interchangeable. A supportive professional community does not by itself supply the expertise needed to address an instructional difficulty, just as professional expertise does not ensure that educators have the relationships and opportunities needed to use it collectively. Educators need conditions in which they can question assumptions, seek help, examine evidence, and improve their work together. Shared responsibility involves meaningful influence over decisions and organized joint work rather than simply assigning additional tasks. The principal's responsibility is to develop and sustain these conditions while keeping the collective work directed toward students' learning needs.

Aligned instructional and organizational action connects teaching and learning opportunities with resources, roles, organizational arrangements, and support. Shared purpose becomes visible in what receives time, who participates, which expertise is sought, and how responsibilities are organized. The resource alignment finding gives particular weight to examining whether the school's commitments match its stated priorities. The instructional dimensions add specificity by distinguishing the coordination of teaching, curriculum coherence, and the use of assessment and feedback to inform instructional responses. Depending on the identified need, action may require changes in curriculum, instructional practices, schedules, staffing, professional support, or relationships with families, communities, and external partners.

Principals and colleagues draw on relevant research, professional expertise, and evidence of student learning to determine an appropriate response. The leadership responsibility is to connect that response with the resources and organizational conditions necessary to carry it out.

Evidence-informed diagnosis and evaluation encompass these four areas rather than occurring as separate stages. Diagnosis brings together evidence about student learning, professional knowledge, and knowledge of the school to identify barriers and plausible explanations. The leadership question becomes more specific than whether current achievement is satisfactory. A school may know where students are performing without adequately understanding how their learning is progressing over time. Diagnosis therefore asks what students need to learn, how their learning is advancing, where opportunities and progress differ, and what features of teaching and organization may warrant attention. Diagnosis also involves examining assumptions. A difficulty initially attributed to insufficient effort may concern curriculum coherence, access to expertise, or the conditions under which teachers work. These possibilities require investigation rather than acceptance as established explanations. The dimension distinctions give principals and colleagues a language for examining such possibilities and considering how barriers might be removed, reduced, or overcome. Diagnosis can therefore inform educational priorities, professional learning, organizational conditions, and instructional responses throughout the work.

Evaluation examines the adequacy of these judgments and responses, their implementation, and student learning. It is present when colleagues establish what would count as progress, when they examine whether a response is being implemented as intended, and when they consider what students are learning as a result of the work underway. Evidence may show that a problem was defined too broadly, that professional learning has not yet been applied, or

that organizational arrangements are limiting implementation. Current achievement levels provide important information, but they do not, by themselves, establish whether learning is advancing. Evidence of changes in student understanding and performance over time, alongside changes in teaching and learning opportunities, helps colleagues examine the response and reconsider earlier assumptions. Following Hattie's (2015) emphasis on shared examination of impact, principals and colleagues need to consider both implementation and student learning, including differences in progress across students. Evaluation should make it possible to sustain promising work, strengthen incomplete implementation, adapt an inadequate response, or discontinue work that does not serve its purpose. These judgments can also prompt renewed diagnosis, refinement of shared priorities, and changes in the professional or organizational support provided.

The overlaps in Figure 5.2 illustrate selected ways these responsibilities can inform and reinforce one another. Shared priorities give professional learning a focus, while developing expertise can lead colleagues to reconsider their understanding of a learning need. Collective ownership and commitment connect educational direction with the professional community responsible for pursuing it. Expertise is applied and refined through instruction as educators examine teaching and student learning. Shared responsibility also requires organizational support, including the time and resources necessary for educators to participate meaningfully and carry out their work. These connections extend beyond the overlaps depicted in the figure. A shared purpose needs to be reflected in instructional and resource decisions, just as professional expertise requires supportive relationships and opportunities for collective examination. The principal's task is to recognize which responsibilities a particular learning need requires, identify

where they are insufficiently connected, and organize a response in which the relevant work supports a common educational purpose.

The Learning-Driven Leadership Model provides a foundation for continued conceptual development. The researcher intends to further clarify its components, proposed connections, and potential applications to educational leadership practice.

What the Domain and Practice Findings Add

Domains preserve the breadth of leadership responsibility, dimensions provide the most useful distinctions in the observed relationships, and practices move closer to daily leadership work where sufficiently comparable evidence exists. The three domains containing multiple quantitatively represented dimensions had relatively close estimates: steward the organization and its environment ($d = 0.35$), create culture and conditions for learning ($d = 0.33$), and lead teaching and learning ($d = 0.30$). These closely grouped estimates reinforce the importance of considering instructional, cultural, and organizational leadership as interconnected responsibilities rather than competing priorities.

This broad view is consistent with the development described in Chapter 2. Hallinger (2011) brought instructional, organizational, and contextual concerns together within leadership for learning. Hitt and Tucker (2016) similarly considered professional capacity, learning experiences, organizational support, and external relationships within a broad account of leadership practice. The present findings add distinctions within that breadth. A domain can identify an area requiring attention, but a dimension helps clarify whether the work concerns, for example, resource alignment or routine operations. Four other domains complete this connected view: establish purpose and direction; build professional expertise and capacity; build collective agency and shared responsibility; and evaluate impact and use evidence. Together, the domain

findings suggest that principals should establish a priority, develop the expertise and participation needed to pursue it, align organizational support with the work, and evaluate what follows. Broad responsibility keeps essential work visible, while more specific distinctions guide diagnosis and action.

The practice findings bring the discussion closer to enactment. Four recurring practices produced combined estimates: setting and sustaining school goals ($d = 0.48$), contingent recognition and reward ($d = 0.45$), visible and accessible leadership contact ($d = 0.36$), and intellectual stimulation for professional inquiry ($d = 0.23$). Twenty-five additional quantitative practices were retained individually. These findings highlight specific activities in research often organized around broader concepts. They also show that relatively few practices had sufficiently comparable evidence from more than one meta-analysis.

The practical contribution is a more specific account of leadership activities that principals can consider in their improvement work. Setting and sustaining goals involves keeping an educational priority present in decisions and professional work. Recognition concerns how contributions are acknowledged; visible and accessible contact concerns the availability of leadership; intellectual stimulation concerns examination of ideas and assumptions. These activities are more specific than a general direction to lead effectively, but their enactment still requires attention to purpose and quality. Robinson et al. (2008) and Robinson and Gray (2019) emphasized this need for specificity beyond the name or frequency of an activity. The findings therefore strengthen the case for studying daily leadership work without reducing it to disconnected microbehaviors.

Context and the Limits of General Guidance

School level was the most frequently tested contextual category and provided the clearest opportunity for repeated cross-source comparison. Even there, findings were mixed and construct-specific. School setting and geography also produced statistically significant differences in selected source- and pathway-specific tests, but those findings did not repeat in a common direction across comparable leadership work. Evidence concerning socioeconomic status or poverty, school size, and sector was sparse or absent. The contextual evidence was therefore limited and uneven and did not support one general rule.

Two school-level comparisons illustrate the distinction. Witziers et al. (2003) reported smaller secondary-school associations for achievement orientation and supervision and evaluation in their source-reported tests. These author-reported constructs correspond to high expectations and achievement focus and instructional monitoring, assessment, and feedback, respectively. However, H. Wu and Shen (2026) did not report statistically significant grade differences for high, cohesive, and culturally relevant expectations for students or real-time and embedded instructional assessment, the corresponding author-reported constructs. The school-level pattern was therefore not repeated consistently across those sources. The findings concern the particular author-reported constructs tested, rather than every form of work within the associated dimensions.

Subgroup estimates provide a different kind of evidence. Liebowitz and Porter (2019) reported separate elementary- and secondary-school estimates for internal relations, which corresponds to relational support and interpersonal leadership, but did not report a formal test of that difference. The secondary-school estimate was larger. This result is descriptively

informative, yet it cannot establish moderation or be treated as a counterpart to the formal tests above.

School-setting and geographic results were similarly specific. H. Wu and Shen (2026) found that school location significantly moderated real-time and embedded instructional assessment in both the direct and indirect pathways, with larger associations in the combined rural/suburban group than in the urban group. This construct contributes to the contextual interpretation of instructional monitoring, assessment, and feedback. For high, cohesive, and culturally relevant expectations for students, the school-setting difference was statistically significant for the indirect pathway but not for the direct pathway. These construct- and pathway-specific findings do not establish a general rural, suburban, or urban advantage for leadership overall.

Geography did not supply one consistent direction either. Witziers et al. (2003) reported smaller associations outside the United States for defining and communicating mission, corresponding to establishing shared purpose and direction, but larger associations for achievement orientation and supervision and evaluation. The differing directions within the same source show why a comparison between countries cannot be converted into a general leadership prescription. Nor does a geographic label identify the cultural or institutional explanation for a difference. Hallinger's (2011) emphasis on understanding leadership in context remains a relevant question for research, while the present synthesis specifies how far the available construct-level findings answer that question.

For principals, the synthesis identifies areas of work warranting attention, but it does not support different dimension priorities simply on the basis of school level, setting, or geography.

These findings make construct-specific contextual relationships an important priority for further research.

Implications for Educational Leadership

The implications follow from the dimension contrasts and the proposed model. They concern three areas: leadership practice; leadership preparation, mentoring, and professional learning; and system support and improvement. The findings offer a more evidence-informed account of the work to be understood and enacted; they do not validate a particular preparation program, mentoring model, or leadership evaluation instrument.

As schools increasingly rely on evidence to select and evaluate educational interventions, the leadership work that supports those decisions also warrants an empirical foundation (U.S. Department of Education, 2016). By examining the observed relationships of specific leadership dimensions and practices with student outcomes, this synthesis helps move beyond broad leadership model labels toward more evidence-informed leadership priorities.

Leadership Practice

The practical implication of the findings is to organize leadership around what students need to learn rather than the completion of separate leadership activities. Principals and colleagues need to clarify the intended learning, examine evidence of what students currently understand and can do, and determine what further learning is needed. Diagnosis requires investigating what is supporting or hindering that learning, not simply identifying a difference between current and expected performance. The proposed Learning-Driven Leadership Model offers four connected questions for considering a response: What shared purpose and direction will guide the work? What educator expertise and professional learning are needed? What culture, conditions, and shared responsibility will enable educators to work effectively together?

What aligned instructional and organizational action will connect teaching, time, resources, and support with the learning priority? These questions help principals identify strengths to build on and areas requiring attention, rather than assuming that every area needs a new initiative. Evidence-informed diagnosis and evaluation guide decisions across all four areas throughout the work. Principals and colleagues examine whether the response is being implemented, how student learning is progressing, and whether to sustain or revise the response or reconsider the original diagnosis.

Consider a school in which students have difficulty explaining mathematical reasoning. A response limited to more frequent assessment may describe the difficulty more thoroughly without addressing it. The principal and teachers could examine student work alongside the tasks students encounter and the teaching of explanations across classrooms. If the concern involves differences in teachers' knowledge of how to elicit and develop reasoning, the response would require professional learning and opportunities for supported application. If expectations or learning opportunities vary across grade levels, curriculum coherence would also require attention. This illustration begins with a need in students' learning and then considers the changes in teaching and support required to address it, rather than starting with a predetermined change in teacher practice.

The selected response then has resource and organizational consequences. Teachers may need access to relevant expertise, time to examine student work together, and clear responsibility for coordinating learning opportunities. The principal's decisions about schedules, staffing, and support should make that response feasible. The response also calls on two dimensions: culture and professional community, and relational support and interpersonal leadership. Educators need conditions in which they can identify uncertainty, seek help, and examine the quality of their

work. Shared leadership and joint work directs attention to whether teachers and specialists have meaningful influence over the response, rather than only additional tasks.

Evaluation keeps the priority active after implementation begins. In the illustration, attendance at professional learning and completion of meetings would indicate activity, while changes in tasks, teaching, and students' explanations would provide different information about enactment and learning. A principal should bring these forms of evidence together to decide whether to strengthen support, revise the response, or sustain the work. The point is to make educational judgment visible in daily decisions. The synthesis supports attention to the work required to move from a recognized problem to an organized response and an examination of its consequences.

Leadership Preparation, Mentoring, and Professional Learning

The findings offer an evidence-informed resource for leadership preparation and professional development, with potential relevance beyond any particular standards framework. For example, the National Educational Leadership Preparation (NELP) standards specify expectations for preparation-program graduates, while the Professional Standards for Educational Leaders (PSEL) describe expectations for professional practice (National Policy Board for Educational Administration [NPBEA], 2015, 2018). The leadership work identified in this study has recognizable connections with these expectations, including shared direction, teaching and learning, professional capacity, organizational support, and family and community engagement. The synthesis adds distinctions within these broad responsibilities and provides a basis for examining how they can be taught and applied together.

Leadership preparation should help candidates understand these distinctions and apply them when making decisions about school improvement. Broad models remain useful for

examining purpose, influence, relationships, and organization, but candidates also need to recognize what those ideas require in practice. The dimension findings provide a basis for teaching how to distinguish a need for professional expertise from a need for curriculum coherence, a resource constraint from an operational problem, and a need to sustain motivation and commitment from a need to strengthen professional community. These distinctions make the daily work of leadership more explicit and provide concrete opportunities for application in leadership preparation and professional learning.

For preparation programs, these connections provide a way to organize learning across standards around the work of responding to an educational need. A case or field experience could ask candidates to interpret evidence of a learning difficulty, investigate plausible explanations, establish a shared priority, identify the professional knowledge needed, and align resources and responsibilities with an appropriate response. Doing so requires enough knowledge of teaching, professional learning, and school organization to ask informed questions and recognize when others' expertise is needed. Candidates would then explain what evidence they would examine to determine whether the response was being implemented and benefiting students. The dimension findings can help distinguish the leadership work involved, while the proposed model provides a structure for examining how that work fits together. This approach connects research, professional expectations, and application through a common educational problem rather than treating each responsibility as a separate task.

This implication also changes how leadership learning can be discussed. Knowing the name of a model or completing a leadership activity provides limited information about the quality of a candidate's decisions. Preparation should make the reasoning behind those decisions available for examination. Candidates can be asked to explain what the evidence shows, how

they distinguished competing explanations, whose knowledge informed their response, and how they would examine implementation and student benefit. Robinson and Gray's (2019) distinction between frequency and quality is useful here: the focus is the substance of the work, not simply whether an activity appears in a record of experience.

The same connections can carry into mentoring, continued professional learning, and improvement-focused evaluation. A principal and mentor or supervisor could examine a current priority, the reasoning behind the selected response, the support required, and the evidence informing subsequent decisions. PSEL already connects professional expectations with preparation, mentoring, evaluation, and career-long learning (NPBEA, 2015). The present synthesis offers a further resource for those conversations by clarifying particular areas of leadership work and their relationships with student outcomes. As national and state leadership standards are reviewed, these distinctions could also inform discussion of how professional expectations are articulated and translated into practice.

The immediate task for those who prepare and develop principals is to teach and assess how leaders use evidence to make decisions about student learning. In cases, field experiences, and coaching conversations, candidates and practicing principals should explain what students need to learn, what the available evidence shows about their current understanding and progress, and what may be helping or hindering learning. They should use the four areas of the Learning-Driven Leadership Model to justify a coordinated response, identify additional evidence or expertise needed, and explain how they would evaluate implementation and student learning. Feedback should strengthen that reasoning, including their willingness to revise a diagnosis or response when new evidence warrants it.

System Support and Improvement

The findings have implications not only for what principals do but also for the district leadership that establishes shared educational priorities and provides conditions for pursuing them. District expectations, resource decisions, and administrative requirements can enable or constrain school improvement. Louis et al. (2010) emphasized the importance of coordinated district support that responds to schools' circumstances. A principal's effort to pursue an agreed educational priority can be weakened when competing initiatives, conflicting expectations, or inflexible arrangements divert attention and resources. District leaders should therefore examine whether the demands and support they provide reinforce the district's educational direction and make the leadership work identified in this synthesis possible. Expectations for principals should be accompanied by usable information, time, staffing, access to expertise, and appropriate authority.

The synthesis can help district leaders develop a more informed understanding of that work. Its value lies in clarifying how leadership responsibilities differ and connect, rather than providing a numerical checklist of activities to emphasize or neglect. District teams can use these distinctions to examine whether their expectations and evaluation processes attend to the substance of leadership or primarily to visible activity. Requiring regular data meetings, for example, does not by itself develop a principal's ability to interpret a learning problem and organize an appropriate response. The relevant questions concern what the principal needs to understand and accomplish, what assistance would help, and whether district requirements reinforce that work.

District support for principals should begin with a clear educational direction and a shared understanding of what progress toward that direction requires. District leaders have a

responsibility to establish and communicate systemwide priorities while helping principals determine how those priorities apply to their schools. Common expectations can provide coherence, but the appropriate response must also reflect each school's evidence, needs, and circumstances. Professional learning, coaching, and opportunities for principals to work with colleagues should develop their capacity to lead that work, while district leaders coordinate the expertise, resources, and organizational support needed for implementation. Such support should be sustained and refined as evidence of implementation and student learning becomes available, rather than provided primarily in response to difficulties or through meetings devoted to administrative requirements (Honig, 2012; Louis et al., 2010).

The district's own work should also be open to examination. Responsibility for supporting schools extends beyond the superintendent and can involve different combinations of central-office leaders and specialists (Honig et al., 2010). Principals and those leaders can examine whether district priorities and support remain aligned with the school's improvement work, whether the necessary conditions are in place, and whether emerging evidence warrants adjustment by the school, the district, or both. This gives supervisory conversations a purpose beyond reviewing the principal's performance. Improvement-focused supervision should identify both what the principal needs to do next and what the district needs to change to make that work possible.

Directions for Future Research

The findings identify several directions for future research on the specific work of leadership, the connections among leadership responsibilities, and the circumstances in which leadership relates to student learning.

First, future studies could investigate how specific leadership practices are enacted and how their quality, purpose, and setting relate to student outcomes. This synthesis combined evidence for four recurring practices and retained 25 additional practices as individual quantitative findings. Studies could examine, for example, how principals sustain school goals in daily decisions, use recognition and reward, remain visible and accessible, or encourage intellectual stimulation for professional inquiry. Qualitative studies could examine the content and enactment of these activities, while longitudinal quantitative and mixed-method studies could investigate their relationships with changes in teaching and student learning. These studies should retain the coherent routines and relationships through which the work occurs, consistent with the attention to specific practices and processes discussed by Leithwood and Sun (2012) and Robinson et al. (2008).

Second, research could examine how leadership responsibilities operate together during school improvement. Longitudinal and mixed-method studies could investigate how a shared learning priority informs resource allocation, how professional learning and professional community support instructional responses, and how evidence informs decisions to sustain or revise the work. Such studies could clarify the connections among these responsibilities over time and their relationships with student learning.

Third, future studies could test construct-specific contextual relationships. The mixed school-level findings and uneven evidence for other circumstances warrant studies of whether clearly defined leadership–student-outcome relationships differ across school levels, settings, socioeconomic conditions, school sizes, or sectors. Where the evidence permits separate comparisons, research could examine rural, suburban, and urban settings individually. Geographic comparisons could investigate the institutional or cultural characteristics proposed to

explain a difference rather than treat geography itself as a cultural mechanism. Each investigation should distinguish descriptions of a sample and separate subgroup estimates from formal tests of whether relationships differ.

Fourth, research could extend the examination of pathways linking specific leadership work with student learning. Leithwood et al. (2010, 2020) and Sebastian and Allensworth (2012) provide an empirical foundation for this work. Studies could investigate how particular dimensions or practices relate to clearly defined intervening processes in teaching, professional capacity, and organizational conditions, and whether those relationships vary across contexts and over time. These investigations would extend existing pathway research without assuming one causal sequence for all leadership work.

Fifth, further studies could examine ethics and professional norms and equity, inclusiveness, and cultural responsiveness in relation to student outcomes. These responsibilities appear in NELP Standards 2 and 3 (NPBEA, 2018), but did not emerge as separately identified synthesized dimensions in this study. Some related content appeared within broader constructs, including culturally relevant expectations and ethical example. Studies that examine these responsibilities explicitly could strengthen their representation in subsequent quantitative syntheses. The absence of separate estimates here does not establish that these responsibilities are unimportant or unsupported in the broader literature.

Sixth, research could investigate which leadership responsibilities are shared across school and district roles and which are distinctive to each. Building on Honig et al. (2010), studies could examine the work of assistant superintendents, principal supervisors, and other central-office leaders, including how district size and the distribution of authority shape their responsibilities. Such studies could investigate the support these leaders provide to principals and

the relationships of their own work with school improvement and student learning. This would test applicability across organizational levels rather than assume that the present findings transfer unchanged.

Across these directions, clear connections among construct definitions, measures, student outcomes, pathways, and estimate-specific results would make the resulting studies useful for cumulative synthesis. Studies can use different terminology while providing enough information to establish what leadership work was examined and how its relationship with student outcomes was estimated.

Conclusion

This dissertation provides a more differentiated account of the leadership work associated with student outcomes. The comparatively larger observed dimension associations involved evidence-informed decision making, resource alignment, culture and professional community, professional learning and capacity building, and establishing shared purpose and direction. Together, these findings direct attention to how principals understand conditions, establish educational direction, develop people and professional community, and organize resources around learning priorities.

The pattern clarifies several consequential distinctions. Evidence-informed judgment extends beyond narrow monitoring. Purposeful resource alignment gives routine functioning an educational direction. Developing professional capability extends beyond examining practice alone, while professional culture and relationships require more than motivation. Shared purpose also differs from setting expectations or sustaining effort: it establishes collective understanding and ownership of the work being pursued. These distinctions sharpen the account of what principal leadership involves.

The proposed Learning-Driven Leadership Model connects shared purpose and direction; educator expertise and professional learning; culture, conditions, and shared responsibility; and aligned instructional and organizational action around student learning. Evidence-informed diagnosis and evaluation inform all four areas throughout the work. Principals coordinate relevant responsibilities, develop expertise and collective capacity, and connect priorities with the resources and support needed for action. Their defining responsibility is to make sound educational judgments with colleagues and examine implementation and student learning to determine whether those judgments should be sustained or revised.

This study offers a more coherent account of leadership work and a practical focus for using it: determine what students need to learn and connect the school's response to that need. Principals have responsibility for making those connections with colleagues; those who prepare and develop principals must build the judgment required to do so; and district leaders must provide coherent priorities and the support that makes the work possible. Evidence-informed diagnosis and evaluation guide decisions throughout and keep the work open to examination and revision. The central question is not simply whether leadership activities have occurred, but whether they address the identified learning need and help students make progress.

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Appendix A - Search Strategies and Supplemental Search Procedures

This appendix documents the original and supplemental search procedures used to identify potentially eligible meta-analyses. Exact database and targeted-language queries are retained where available to support reproducibility. Later search-expansion procedures were conducted as checks on the completeness of the original search and did not change the study's substantive or methodological eligibility criteria.

Original Database Searches

Table A.1

Original Database Search Strategies

Database or platform	Exact search query	Limits	Records and search date
ERIC (ProQuest)	("educational leadership" OR "school leadership" OR "principal leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "leadership dimensions" OR "leadership practices" OR "leadership domains" OR "leadership functions" OR "leadership tasks" OR "leadership responsibilities" OR "leadership models" OR "leadership frameworks") AND ("meta-analysis" OR "meta analytic" OR "meta-analytic") AND ("student achievement" OR "academic achievement" OR "standardized test scores" OR "student outcomes" OR attendance OR graduation OR engagement OR "social emotional" OR "social-emotional" OR discipline)	January 1, 2000–May 30, 2026	69 records; searched May 30, 2026.

Database or platform	Exact search query	Limits	Records and search date
APA PsycINFO (ProQuest)	("educational leadership" OR "school leadership" OR "principal leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "leadership dimensions" OR "leadership practices" OR "leadership domains" OR "leadership functions" OR "leadership tasks" OR "leadership responsibilities" OR "leadership models" OR "leadership frameworks") AND ("meta-analysis" OR "meta analytic" OR "meta-analytic") AND ("student achievement" OR "academic achievement" OR "standardized test scores" OR "student outcomes" OR attendance OR graduation OR engagement OR "social emotional" OR "social-emotional" OR discipline)	January 1, 2000–May 30, 2026	58 records; searched May 30, 2026.
Web of Science Core Collection	("educational leadership" OR "school leadership" OR "principal leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "leadership dimensions" OR "leadership practices" OR "leadership domains" OR "leadership functions" OR "leadership tasks" OR "leadership responsibilities" OR "leadership models" OR "leadership frameworks") AND ("meta-analysis" OR "meta analytic" OR "meta-analytic") AND ("student achievement" OR "academic achievement" OR "standardized test scores" OR "student outcomes" OR attendance OR graduation OR engagement OR "social emotional" OR "social-emotional" OR discipline)	Topic search; 2000–2026; English language	72 records; searched May 30, 2026.

Database or platform	Exact search query	Limits	Records and search date
Scopus	TITLE-ABS-KEY(("educational leadership" OR "school leadership" OR "principal leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "leadership dimensions" OR "leadership practices" OR "leadership domains" OR "leadership functions" OR "leadership tasks" OR "leadership responsibilities" OR "leadership models" OR "leadership frameworks") AND ("meta-analysis" OR "meta analytic" OR "meta-analytic") AND ("student achievement" OR "academic achievement" OR "standardized test scores" OR "student outcomes" OR attendance OR graduation OR engagement OR "social emotional" OR "social-emotional" OR discipline))	Title, abstract, and keyword search; 2000–2026; English language	64 records; searched May 30, 2026.
ProQuest Dissertations & Theses	TITLE (meta-analysis OR meta analytic OR meta-analytic) AND ABSTRACT ("educational leadership" OR "school leadership" OR "principal leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "leadership dimensions" OR "leadership practices" OR "leadership domains" OR "leadership functions" OR "leadership tasks" OR "leadership responsibilities" OR "leadership models" OR "leadership frameworks")	Meta-analysis terms searched in titles and leadership terms in abstracts; 2000–2026; English language; master's and doctoral dissertations included.	20 records; searched May 30, 2026.

Original Google Scholar Searches

Google Scholar was searched May 30, 2026, using five relevance-ranked queries covering 2000–2026. The first 100 displayed results from each query were screened. The counts

below are candidate records retained for further screening rather than total Google Scholar result counts.

Run 1: "school leadership" "meta-analysis" "student achievement": 40 saved.

Run 2: "educational leadership" "meta-analysis" "student outcomes": 0 saved.

Run 3: "instructional leadership" "meta-analysis" "student achievement": 2 saved.

Run 4: "transformational leadership" "meta-analysis" "student achievement": 2 saved.

Run 5: "principal leadership" "meta-analysis" "student outcomes": 2 saved.

Original-Search Reconciliation

The five database searches yielded 283 records, and Google Scholar contributed 46 retained candidate records, for 329 records identified through the original search. Deduplication reduced this set to 232 records for screening. Archived pre- and post-deduplication records support the net reduction of 97 records, although the individual duplicate removals were not retrospectively audited one by one.

Supplemental Citation Searching

Backward reference searching was conducted July 5–6, 2026, through manual examination of the reference lists of Tan et al. (2022), Kaya (2023), Almarshad (2017), Bellibaş, Ninković, and Polatcan (2026) and Bellibaş, Veletic, et al. (2026), Karadağ (2020), Karadağ and Sertel (2026), Leithwood and Sun (2012), Liebowitz and Porter (2019), Pietsch et al. (2025), Robinson et al. (2008), Shen and Wu (2025), Sun and Leithwood (2012, 2015), Waters et al. (2003), and Witziers et al. (2003). Forward citation searching was conducted July 6, 2026, for Robinson et al. (2008), Marzano et al. (2005), Witziers et al. (2003), Hallinger and Heck (1996, 1998), Leithwood and Sun (2012), and Liebowitz and Porter (2019). The platform used for forward citation searching was not retained.

Supplemental MetaX Search: August 5, 2026

The Visible Learning MetaX database (Corwin Visible Learning Plus, 2026; https://www.visiblelearningmetax.com/) was searched on August 5, 2026, as a supplemental source for identifying candidate meta-analyses. This search was separate from John Hattie's expert referral of additional candidate records. Candidates were reviewed under the study's eligibility criteria and reconciled against existing records to avoid counting duplicate encounters as new records.

Supplemental Database Search Expansion: September 8, 2026

On September 8, 2026, the database search was broadened to test whether the original terminology, English-language restriction, or 2000 publication-date boundary had limited retrieval. The study's substantive and methodological eligibility criteria did not change.

Table A.2

Supplemental Database Search Expansion Results

Database	Original records	Expanded-search records	Additional records screened	Newly eligible meta-analyses
ERIC	69	113	44	0
APA PsycINFO	58	153	94	0
Web of Science	72	124	53	0
Scopus	64	139	73	0
ProQuest Dissertations & Theses	20	28	8	0
Total	**283**	**557**	**272**	**0**

Note. The 272 additional records are the sum of additional records identified within the five separate database comparisons. Because records could overlap across databases, 272 is not a deduplicated count of unique records. No additional eligible meta-analysis was identified.

The five primary databases were also checked without the English-language restriction for publications from 2000–2026. No additional eligible non-English meta-analysis was identified through this check.

Expanded terminology was also applied to pre-2000 literature without a language restriction. These searches returned 31 records before cross-database deduplication. No additional eligible meta-analysis was identified, and the formal publication eligibility period remained 2000–2026.

Targeted Language Searches: September 20, 2026

On September 20, 2026, targeted Google Scholar searches using Chinese/Taiwanese and Spanish terminology were conducted to check for literature that English-language search terms might miss. Up to the first 100 displayed results for each query were screened. Exact returned and screened counts for individual queries were not retained. These were targeted language-expansion checks rather than exhaustive multilingual searches.

Chinese/Taiwanese queries

(校長 OR 學校) 領導 (後設分析 OR 統合分析 OR 元分析)

(校长 OR 学校) 领导 (元分析 OR 荟萃分析 OR 整合分析)

教學領導 (後設分析 OR 統合分析 OR 元分析) (學生成就 OR 學業成就 OR 學生效能 OR 學校效能)

教学领导 (元分析 OR 荟萃分析 OR 整合分析) (学生成绩 OR 学业成就 OR 学生效能 OR 学校效能)

Spanish queries

"liderazgo escolar" (metaanálisis OR "meta-análisis" OR "meta análisis")

("liderazgo directivo" OR "liderazgo del director") (metaanálisis OR "meta-análisis" OR "meta análisis")

("liderazgo pedagógico" OR "liderazgo instruccional") (metaanálisis OR "meta-análisis" OR "meta análisis") ("rendimiento académico" OR "logro académico" OR "resultados de aprendizaje" OR "eficacia escolar")

Relationship to PRISMA Reporting

Figure 4.1 presents the governing PRISMA study-selection flow. The September 8, 2026, expanded-terminology, language-restriction, and pre-2000 checks identified no additional eligible meta-analysis. Later targeted-language searches identified candidate records, including one meta-analysis that was subsequently determined eligible and included in the final evidence base. Candidates from supplemental routes that entered the formal screening or retrieval process were counted once in the other-methods pathway. Detailed reconciliation records are retained in the study's durable search documentation.

Appendix B - Dissertation Codebook

B.1 Purpose of the Codebook

This appendix summarizes the variables and coding rules used in the study. Source-faithful reconstruction preserved author terminology, construct meanings, hierarchy, outcomes, and reported quantitative information before researcher classifications were applied. These definitions and rules support reproduction of the coding system.

The final evidence base contains 17 included meta-analyses and 115 unique author constructs: 77 classified as dimension, 33 as practice, two as broad approach/model, and three with unresolved Analytic Construct Type. Of these, 104 have a researcher-defined dimension assignment and 11 remain intentionally unassigned or unresolved at that layer. The final comparative architecture contains 15 dimensions within seven higher-order domains. The manuscript's broad approach/model reporting category corresponds to the existing internal Style/Model coding value; this presentation terminology does not change the classification.

B.2 Two-Stage Coding Process

Table B.1

Two-Stage Coding Process

Stage	Unit of review	Coding action
Pass 1: Source-Faithful Author Reconstruction	Within each meta-analysis	Preserve author terminology, construct meaning or description, author hierarchy and framework placement, outcome wording, and reported quantitative information.
Pass 2: Cross-Study Comparative Classification	Across included constructs	Compare intact author constructs; assign Analytic Construct Type; assign one synthesized dimension where defensible and its corresponding higher-order domain; retain unresolved or intentionally unassigned cases.

The coding process answered three distinct questions while keeping source information separate from researcher decisions:

What did the source call and report? The source-reported fields preserve the author's construct label, construct-type term, meaning or description, and hierarchy. This layer records the source as presented; an author's label such as "practice" is not itself a researcher classification.

At what analytic level did the researcher classify the intact construct? Analytic Construct Type is a researcher-classified field reported here as broad approach/model, dimension, practice, or NA when supported. Classification is based on substantive meaning, breadth, function, hierarchy, operationalization, and source evidence, not on the author's label alone. Insufficient evidence leaves the field blank, with uncertainty documented; Unresolved is not a categorical code.

Where, if anywhere, did the construct fit in the cross-study comparative structure? Synthesized Dimension and Higher-Order Domain are researcher-created placement fields. A construct may receive one primary synthesized-dimension assignment and the corresponding domain; a researcher-classified practice may receive that placement while remaining a practice. The Synthesized Dimension field is therefore not the same as Analytic Construct Type = Dimension, and Higher-Order Domain is not another Analytic Construct Type.

B.3 Codebook Variables

Tables B.2–B.5 in Appendix B group the variables by purpose. Listed categorical values reflect the final coded data for the 17 included meta-analyses. Missing-information rules remain applicable, including NA for Analytic Construct Type even though no construct in the final evidence base was coded NA.

Table B.2

Study and Source Information

Variable	Definition and coding values
Meta ID	Researcher-assigned. Unique identifier linking each included meta-analysis to its coded constructs and estimates.
Author	Source-reported bibliographic information. Author or author group of the coded meta-analysis.
Year	Source-reported bibliographic information. Publication year of the meta-analysis, not the publication years of its primary studies.
Publication Type	Researcher-coded bibliographic category of the cited publication: Journal Article; Dissertation; Book; Book Chapter; Other. Book identifies a complete volume; Book Chapter identifies an individual chapter within a larger volume.
Primary Source Profile	Source-reported. Publication composition of the primary studies: Mixed (published and unpublished evidence); Unpublished-Only (dissertations, reports, conference papers, or comparable unpublished evidence only); NR.

Note. NR = not reported or not responsibly determinable under the applicable field's coding rule.

Table B.3

Construct and Classification Information

Variable	Definition and coding values
Parent Model	Source-reported. Assign only when the source explicitly identifies a model or tradition or clearly places the construct within it; do not infer a model from resemblance. Final values: Instructional; Transformational; Distributed; Behavioral / Task-Based; LCSL; Other; NR. LCSL means Learning-Centered School Leadership; Other denotes another explicitly named model.
Author Construct Type	Source-reported. Preserve the author's term for the type of construct, rather than its name. Observed terms: Category; Dimension; Practice; Responsibility; Subdimension; factor; individual dimension; leadership style. These are author terms, not researcher codes.

Variable	Definition and coding values
Leadership Construct	Source-reported. Preserve the exact construct name; do not replace it with a researcher category.
Author Definition / Description	Author-grounded; researcher-summarized. Concise meaning based on a formal definition or the strongest available description, components, indicators, operationalization, or narrative.
Author Hierarchy / Dimension Group	Source-reported. Immediate parent or grouping within the author's framework. Preserve author wording; use Author NR when a relevant parent is unreported and NA when no immediate-parent relationship applies. The full author hierarchy was retained during coding.
Analytic Construct Type	Researcher-classified. Report broad approach/model, dimension, practice, or NA when supported. If evidence is insufficient, leave the field blank and document the uncertainty; do not enter Unresolved. No construct in the final evidence base was coded NA. See B.4 for the boundaries.
Synthesized Dimension	Researcher-synthesized. One primary cross-study functional assignment for the intact construct, using the 15 categories in Table B.7 in Appendix B. Leave blank when no defensible assignment can be made. This assignment does not change Analytic Construct Type.
Higher-Order Domain	Researcher-synthesized. Broader organizational category associated with the assigned dimension in the final comparative architecture. Use the seven exact domain labels in Table B.7 in Appendix B; leave blank when the dimension is unassigned.

Note. NR = not reported or not responsibly determinable under the applicable field's coding rule.

NA = not applicable.

Table B.4

Outcome and Contextual Information

Variable	Definition and coding values
Author Outcome	Source-reported. Preserve the source's outcome wording separately from the standardized category.

Variable	Definition and coding values
Standardized Outcome	Researcher-classified descriptive category based on estimate-specific evidence when available, otherwise on the source-supported author-defined outcome construct or review-wide scope. Reference Notes identify that basis; Author Outcome preserves the source wording. Mixed Student Outcomes denotes academic and nonacademic breadth, not every outcome type in every contributing measure. An incomplete estimate-by-outcome crosswalk alone does not require NR; remaining uncertain cases require researcher review. Final values: General / Composite Academic Outcome; Math; Mixed Student Outcomes; NR. This descriptive field does not independently determine statistical eligibility, source selection, or quantitative inclusion.
School Level	Source-reported. Educational level represented in the coded evidence: Primary; Secondary; Mixed; NR.
SES Context	Source-reported. Socioeconomic context represented in the evidence: Mixed; NR. Do not infer socioeconomic status from geography, school type, or general contextual knowledge.
Geography	Source-reported. Geographic coverage of the coded evidence: USA; Asia; Turkey; International; NR. This is distinct from the first author's institutional country.
School Setting	Source-reported. Setting represented in the evidence: Urban; Mixed; NR. Code only from the source's contextual information.

Note. SES = socioeconomic status. NR = not reported or not responsibly determinable under the applicable field's coding rule.

These descriptive context fields support interpretation but do not constitute the whole RQ5 contextual-moderator synthesis. RQ5 also used source-reported moderator and subgroup evidence, as described in Chapter 3 and Appendix E.

Table B.5

Quantitative Information and Source Qualifications

Variable	Definition and coding values
Estimate-specific *k*	Source-reported or source-grounded derivation. Number of primary studies contributing to the specific estimate, with the source's analytical unit and any derivation documented. Do not substitute a source-wide total, number of effects, or participant count.
Number of effects, *n*	Source-reported. Number of effects or effect estimates contributing to the reported result; distinct from *k* and participant *N*.
Participant *N*	Source-reported. Participant sample size associated with the reported result, where available.
Reported Metric	Source-reported. Original effect-size scale: *d*; *r*; *Z*. Preserve the source's scale before conversion.
Effect Path Type	Researcher-classified from source evidence. Direct; Indirect; Mixed; NR. Mixed covers estimates combining, or not separating, direct and indirect relationships.
Original Effect Size	Source-reported. Numeric effect on its original scale, retaining its sign and source qualifications.
Reported uncertainty / precision	Source-reported. Original *SE* and Original 95% CI, where retained, remain on the source scale. Missing precision is left blank; it is not invented.
Model Type	Source-reported or conservatively source-determined. Aggregation model for the source estimate: Fixed; Random; NR. This describes the source meta-analysis, not the dissertation's estimator.
Cohen's *d*	Source-reported or researcher-derived. Common metric when *d* was reported or an adopted conversion was defensible. Conversion and analysis procedures appear in Chapter 3.
Reference Notes / source qualifications	Source-reported and researcher-documented. Concise source locators, consequential qualifications, discrepancies, uncertainty, and derivation or conversion notes attached to the coded row. Detailed study-specific coding rationale was retained during analysis.

Note. NR = not reported or not responsibly determinable under the applicable field's coding rule.

Numeric fields remain blank when unavailable or not defensibly derivable. Additional derived precision fields (*SE d* and Variance *d*) were retained during analysis but were not used as

weights in the final *k*-weighted estimator. See Chapter 3 for statistical procedures. *SE* = standard error; CI = confidence interval.

B.4 Analytic Construct Type Rules

Table B.6

Analytic Construct Type Definitions

Code or blank field	Meaning and rule
broad approach/model	An overarching leadership approach, theory, orientation, or framework spanning multiple substantively distinct areas of leadership work. It ordinarily requires several distinct areas to represent it adequately.
Dimension	A broad, coherent area of leadership work or responsibility organized around one function or purpose. It ordinarily requires multiple related indicators or actions. Source-supported leader knowledge or capacity can qualify when treated as a substantive leadership responsibility.
Practice	A specific leadership activity, routine, or closely related set of activities through which leadership work is carried out. The activity or routine could ordinarily be observed or documented, although direct observation is not required for classification.
NA	The captured construct does not itself represent leadership at the relevant analytic level. Do not use NA for sparse reporting, difficult classification, or uncertainty. No construct in the final evidence base was coded NA.
Blank (unresolved)	Available evidence does not support a responsible classification. Leave the field blank and document the evidentiary problem. Unresolved is not a separate code.

Apply these rules to the intact author construct:

- Use substantive meaning, function, breadth, hierarchy, framework placement, and operational evidence; author labels alone do not determine the code.
- A component count alone does not distinguish a dimension from a practice. Missing item lists do not require a blank if other source evidence is sufficient.
- Preserve the whole construct. Do not split a broad reported construct to manufacture narrower effects or classifications.

- Do not use effect magnitude to determine classification or treat similar labels as equivalent meanings.
- Retain genuine uncertainty; do not force a code or substitute NA for insufficient evidence.

B.5 Synthesized-Dimension and Domain Assignment

Apply the assignment process in sequence. First, preserve the intact author construct; do not split it unless the source reported separate constructs or effects. Second, assign one primary researcher-defined dimension only when the construct supports a defensible common substantive interpretation based on function, meaning, breadth, hierarchy, framework placement, and source evidence. A researcher-classified practice may receive this placement while remaining a practice.

Third, the higher-order domain follows from the assigned dimension because each dimension has one primary domain. Fourth, determine quantitative eligibility and pooling separately; conceptual placement does not itself establish comparability, inclusion, or pooling. Blank dimension and domain assignments are allowed when no defensible placement can be made, and unassigned constructs are not forced into the comparative architecture. Chapter 3 explains quantitative representation and domain roll-up procedures.

B.6 Final Domain–Dimension Reference

Table B.7

Final Domains, Synthesized Dimensions, and Coding Definitions

Synthesized dimension	Brief coding definition
Establish Purpose and Direction	
Establishing Shared Purpose and Direction	Establishing, communicating, and sustaining shared educational purpose, mission, goals, priorities, ownership, and direction.

Synthesized dimension	Brief coding definition
Lead Teaching and Learning	
Integrated Leadership of Teaching and Learning	Leading and improving teaching and learning through an intact construct integrating multiple instructional functions; its meaning exceeds one narrower function.
Curriculum and Program Coherence	Developing, coordinating, aligning, implementing, and maintaining coherence across curriculum, teaching, assessment, and the instructional program.
Instructional Monitoring, Assessment, and Feedback	Monitoring and evaluating teaching and student learning, using instructional evidence, and providing feedback; distinct from broader organizational diagnosis.
Build Professional Expertise and Capacity	
Professional Learning and Capacity Building	Strengthening educators' knowledge, skills, expertise, judgment, inquiry, and collective capability through professional learning, intellectual challenge, and reflection.
Create Culture and Conditions for Learning	
High Expectations and Achievement Focus	Establishing and sustaining ambitious expectations for student learning and adult performance, with a persistent achievement and learning focus.
Relational Support and Interpersonal Leadership	Building constructive interpersonal relationships, individualized support, responsiveness, trust, care, and supportive communication.
Motivating and Sustaining Commitment	Energizing, recognizing, reinforcing, and sustaining individual and collective motivation, commitment, confidence, and persistence.
Culture and Professional Community	Building shared beliefs, values, trust, collegiality, cohesion, cooperation, professional norms, and collective responsibility.
Safe, Supportive, and Productive Conditions for Learning	Establishing and protecting safe, orderly, caring, respectful, supportive, and disruption-resistant conditions for teaching and learning.

Synthesized dimension	Brief coding definition
Build Collective Agency and Shared Responsibility	
Shared Leadership and Joint Work	Organizing meaningful participation, shared influence, responsibility, decision involvement, and joint work; not equivalent to an overall Distributed Leadership model.
Evaluate Impact and Use Evidence	
Evidence-Informed Decision Making	Using formal or informal evidence for broader organizational diagnosis, sensemaking, impact evaluation, and leadership decisions.
Steward the Organization and Its Environment	
Resource Alignment	Securing and deploying resources, expertise, infrastructure, and supports for educational priorities; distinct from routine operations.
Organizational Management and Operations	Managing, maintaining, improving, or redesigning school structures, systems, processes, routines, and operational arrangements.
External Relations and Partnerships	Strengthening outward-facing relationships, partnerships, accountability relationships, representation, advocacy, and family or community engagement.

Appendix B defines the final coding categories; Appendix C presents their complete application to all 115 author constructs in the final evidence base, including classifications and mappings.

B.7 Brief Coding Examples

Table B.8

Brief Coding Examples

Source example	What the coding distinction shows
Leithwood and Sun (2012): Building collaborative structures	The source called Building collaborative structures a Practice, but the researcher classified the intact construct as a dimension because its substantive breadth extended beyond one specific action. It was then placed in shared leadership and joint work within build collective agency and shared responsibility. The author's label is preserved but does not by itself control the researcher's analytic classification.
Witziers et al. (2003): Visibility	A researcher-classified practice with a quantitative finding, but no dimension or domain assignment. The blank synthesis assignment does not mean that the practice was excluded.
Ozdogru et al. (2025): Distributed Leadership	Classified as broad approach/model, with its author label and values preserved. Dimension and Domain remain blank; the overall effect stays outside dimension/practice synthesis.

B.8 Missing and Unresolved Information

NR means not reported or not responsibly determinable for the applicable descriptive or categorical field. NA means genuinely not applicable under that field's rule. Leave unavailable or indefensible numeric values blank. Leave unresolved analytic construct type blank and document the uncertainty; Unresolved is not a code. Missing information was not invented.

Appendix C - Complete Author-Construct Classification and Analytic Mapping

This appendix presents the complete construct-level application of the coding and comparative-classification procedures described in Chapter 3 and Appendix B. It distinguishes author-reported terminology and construct type from researcher-classified analytic type and researcher-defined dimension and higher-order domain assignments. Conceptual assignment does not by itself establish quantitative inclusion or pooling eligibility.

Table C.1

Complete Author-Construct Classification and Analytic Mapping

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Brown (2001)	Instructional Organization	Dimension	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Brown (2001)	Climate	Dimension	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
Brown (2001)	Defining the mission	Dimension	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Brown (2001)	Consideration	Dimension	Dimension	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Brown (2001)	Inspiration	Dimension	Dimension	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Leithwood & Sun (2012)	Building collaborative structures	Practice	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Leithwood & Sun (2012)	Providing individualized support	Practice	Practice	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Leithwood & Sun (2012)	Holding high performance expectations	Practice	Practice	High Expectations and Achievement Focus	Create Culture and Conditions for Learning
Leithwood & Sun (2012)	Modeling behavior	Practice	Practice	Not assigned	Not assigned
Leithwood & Sun (2012)	Providing intellectual stimulation	Practice	Practice	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Leithwood & Sun (2012)	Developing a shared vision and build goal consensus	Practice	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Leithwood & Sun (2012)	Strengthening school culture	Practice	Dimension	Culture and Professional Community	Create Culture and Conditions for Learning
Leithwood & Sun (2012)	Contingent reward	Practice	Practice	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Leithwood & Sun (2012)	Management by exception	Practice	Practice	Organizational Management and Operations	Steward the Organization and Its Environment
Liebowitz & Porter (2019)	Instructional management	Category	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Liebowitz & Porter (2019)	Internal relations	Category	Dimension	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Liebowitz & Porter (2019)	Organizational management	Category	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment
Liebowitz & Porter (2019)	Administration	Category	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment
Liebowitz & Porter (2019)	External relations	Category	Dimension	External Relations and Partnerships	Steward the Organization and Its Environment
Marzano et al. (2005)	Affirmation	Responsibility	Practice	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
Marzano et al. (2005)	Change Agent	Responsibility	Practice	Culture and Professional Community	Create Culture and Conditions for Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Marzano et al. (2005)	Contingent Rewards	Responsibility	Practice	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
Marzano et al. (2005)	Communication	Responsibility	Practice	Not assigned	Not assigned
Marzano et al. (2005)	Culture	Responsibility	Dimension	Culture and Professional Community	Create Culture and Conditions for Learning
Marzano et al. (2005)	Discipline	Responsibility	Practice	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
Marzano et al. (2005)	Flexibility	Responsibility	Practice	Not assigned	Not assigned
Marzano et al. (2005)	Focus	Responsibility	Practice	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Marzano et al. (2005)	Ideals/Beliefs	Responsibility	Practice	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Marzano et al. (2005)	Input	Responsibility	Practice	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Marzano et al. (2005)	Intellectual Stimulation	Responsibility	Practice	Professional Learning and Capacity Building	Build Professional Expertise and Capacity

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Marzano et al. (2005)	Involvement in Curriculum, Instruction, and Assessment	Responsibility	Practice	Curriculum and Program Coherence	Lead Teaching and Learning
Marzano et al. (2005)	Knowledge of Curriculum, Instruction, and Assessment	Responsibility	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Marzano et al. (2005)	Monitoring/Evaluating	Responsibility	Practice	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence
Marzano et al. (2005)	Optimizer	Responsibility	Practice	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
Marzano et al. (2005)	Order	Responsibility	Practice	Organizational Management and Operations	Steward the Organization and Its Environment
Marzano et al. (2005)	Outreach	Responsibility	Practice	External Relations and Partnerships	Steward the Organization and Its Environment
Marzano et al. (2005)	Relationships	Responsibility	Practice	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Marzano et al. (2005)	Resources	Responsibility	Practice	Resource Alignment	Steward the Organization and Its Environment
Marzano et al. (2005)	Situational Awareness	Responsibility	Dimension	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Marzano et al. (2005)	Visibility	Responsibility	Practice	Not assigned	Not assigned
Ozdogru et al. (2025)	Supportive Leadership	leadership style	Dimension	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Ozdogru et al. (2025)	Distributed Leadership	leadership style	broad approach/model	Not assigned	Not assigned
Robinson et al. (2008)	Establishing goals and expectations	Dimension	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Robinson et al. (2008)	Strategic resourcing	Dimension	Dimension	Resource Alignment	Steward the Organization and Its Environment
Robinson et al. (2008)	Planning, coordinating, and evaluating teaching and the curriculum	Dimension	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Robinson et al. (2008)	Promoting and participating in teacher learning and development	Dimension	Dimension	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Robinson et al. (2008)	Ensuring an orderly and supportive environment	Dimension	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
Tan et al. (2024)	Enhancing teaching-and-learning	Practice	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Tan et al. (2024)	Building shared vision and values	Practice	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Tan et al. (2024)	Providing professional development	Practice	Dimension	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Tan et al. (2024)	Empowering teachers	Practice	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Tan et al. (2024)	Motivating teachers	Practice	Dimension	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
Tan et al. (2024)	Managing resources	Practice	Dimension	Resource Alignment	Steward the Organization and Its Environment
Tan et al. (2024)	Redesigning the school	Practice	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment
Tan et al. (2024)	Engaging families and community	Practice	Dimension	External Relations and Partnerships	Steward the Organization and Its Environment
Tan et al. (2024)	Managing external accountability and relationships	Practice	Dimension	External Relations and Partnerships	Steward the Organization and Its Environment

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Uysal & Sarıer (2018)	Collaborative Leadership	leadership style	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Witziers et al. (2003)	Defining and communicating mission	Subdimension	Practice	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Witziers et al. (2003)	Supervision and evaluation	Subdimension	Practice	Instructional Monitoring, Assessment, and Feedback	Lead Teaching and Learning
Witziers et al. (2003)	Monitoring	Subdimension	Practice	Instructional Monitoring, Assessment, and Feedback	Lead Teaching and Learning
Witziers et al. (2003)	Coordinating and managing curriculum	Subdimension	Practice	Curriculum and Program Coherence	Lead Teaching and Learning
Witziers et al. (2003)	Advice and support	Subdimension	Practice	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Witziers et al. (2003)	Visibility	Subdimension	Practice	Not assigned	Not assigned
Witziers et al. (2003)	School improvement	Subdimension	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Witziers et al. (2003)	Achievement orientation	Subdimension	Practice	High Expectations and Achievement Focus	Create Culture and Conditions for Learning
H. Wu (2020)	Commitment and passion for school renewal	Dimension	Dimension	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
H. Wu (2020)	Safe and orderly school operation	Dimension	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
H. Wu (2020)	High, cohesive, and culturally relevant expectations for students	Dimension	Dimension	High Expectations and Achievement Focus	Create Culture and Conditions for Learning
H. Wu (2020)	Distributive and empowering leadership	Dimension	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
H. Wu (2020)	Coherent curricular programs	Dimension	Dimension	Curriculum and Program Coherence	Lead Teaching and Learning
H. Wu (2020)	Real-time and embedded instructional assessment	Dimension	Dimension	Instructional Monitoring, Assessment, and Feedback	Lead Teaching and Learning
H. Wu (2020)	Data-informed decision-making	Dimension	Dimension	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
H. Wu & Shen (2026)	Commitment and passion for school renewal	Dimension	Dimension	Motivating and Sustaining Commitment	Create Culture and Conditions for Learning
H. Wu & Shen (2026)	Safe and orderly school operation	Dimension	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
H. Wu & Shen (2026)	High, cohesive, and culturally relevant expectations for students	Dimension	Dimension	High Expectations and Achievement Focus	Create Culture and Conditions for Learning
H. Wu & Shen (2026)	Distributive and empowering leadership	Dimension	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
H. Wu & Shen (2026)	Coherent curricular programs	Dimension	Dimension	Curriculum and Program Coherence	Lead Teaching and Learning
H. Wu & Shen (2026)	Real-time and embedded instructional assessment	Dimension	Dimension	Instructional Monitoring, Assessment, and Feedback	Lead Teaching and Learning
H. Wu & Shen (2026)	Data-informed decision-making	Dimension	Dimension	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence
Kyriakides et al. (2010)	Policy on teaching	factor	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Kyriakides et al. (2010)	Quantity of teaching	factor	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
Kyriakides et al. (2010)	Opportunity to learn	factor	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Kyriakides et al. (2010)	Quality of teaching	factor	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
Kyriakides et al. (2010)	Student assessment	factor	Dimension	Instructional Monitoring, Assessment, and Feedback	Lead Teaching and Learning
Kyriakides et al. (2010)	Collaboration	factor	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Kyriakides et al. (2010)	Partnership policy	factor	Dimension	External Relations and Partnerships	Steward the Organization and Its Environment
Kyriakides et al. (2010)	Teacher empowerment	factor	Unresolved*	Not assigned	Not assigned
Kyriakides et al. (2010)	Autonomy	factor	Unresolved*	Not assigned	Not assigned
Kyriakides et al. (2010)	Resources and working conditions (e.g. salary)	factor	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Kyriakides et al. (2010)	Evaluation of policy on teaching	factor	Practice	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence
Kyriakides et al. (2010)	School climate	factor	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
Scheerens et al. (2013)	Monitoring	factor	Practice	Not assigned	Not assigned
Scheerens et al. (2013)	Achievement orientation	factor	Dimension	High Expectations and Achievement Focus	Create Culture and Conditions for Learning
Scheerens et al. (2013)	Differentiation	factor	Unresolved*	Not assigned	Not assigned
Scheerens et al. (2013)	Orderly climate	factor	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
J.-F. Wu (2020)	Developing instructional mission/tasks and goals	individual dimension	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
J.-F. Wu (2020)	Ensuring curriculum and instructional quality	individual dimension	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning
J.-F. Wu (2020)	Enhancing students' learning climate	individual dimension	Dimension	High Expectations and Achievement Focus	Create Culture and Conditions for Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
J.-F. Wu (2020)	Developing a supportive work environment	individual dimension	Dimension	Safe, Supportive, and Productive Conditions for Learning	Create Culture and Conditions for Learning
J.-F. Wu (2020)	Promoting teachers' professional growth	individual dimension	Dimension	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Ertem (2021)	Collaborative Leadership	leadership style	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Ertem (2021)	Distributed Leadership	leadership style	broad approach/model	Not assigned	Not assigned
Ertem (2021)	Supportive Leadership	leadership style	Dimension	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning
Shen et al. (2020)	Promoting a shared school vision, mission and goals of student learning	Dimension	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Shen et al. (2020)	Coordinating and managing beyond the classroom	Dimension	Dimension	Organizational Management and Operations	Steward the Organization and Its Environment
Shen et al. (2020)	Facilitating improvements in curriculum, instruction, and assessment	Dimension	Dimension	Integrated Leadership of Teaching and Learning	Lead Teaching and Learning

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Shen et al. (2020)	Promoting teachers' professional development	Dimension	Dimension	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Shen et al. (2020)	Engaging in policy and decision making	Dimension	Dimension	Shared Leadership and Joint Work	Build Collective Agency and Shared Responsibility
Shen et al. (2020)	Improving outreach and collaboration with families and communities	Dimension	Dimension	External Relations and Partnerships	Steward the Organization and Its Environment
Shen et al. (2020)	Fostering a collaborative culture in school	Dimension	Dimension	Culture and Professional Community	Create Culture and Conditions for Learning
Meng (2018)	Vision, Planning, and Management	Dimension	Dimension	Establishing Shared Purpose and Direction	Establish Purpose and Direction
Meng (2018)	Member Development and Training	Dimension	Dimension	Professional Learning and Capacity Building	Build Professional Expertise and Capacity
Meng (2018)	Technology and Infrastructure Support	Dimension	Dimension	Resource Alignment	Steward the Organization and Its Environment
Meng (2018)	Evaluation and Research	Dimension	Dimension	Evidence-Informed Decision Making	Evaluate Impact and Use Evidence

Study	Author-reported construct	Author-reported construct type	Analytic construct type	Synthesized dimension	Higher-order domain
Meng (2018)	Interpersonal Relations and Communication Skills	Dimension	Dimension	Relational Support and Interpersonal Leadership	Create Culture and Conditions for Learning

Note. Author-Reported Construct and Author-Reported Construct Type preserve source terminology. Analytic Construct Type, Synthesized Dimension, and Higher-Order Domain are researcher-created comparative classifications. A practice may have a researcher-defined dimension and domain assignment while remaining classified as a practice. "Not assigned" indicates that no dimension assignment was made and may reflect an intentionally unassigned practice, a broad approach/model construct, or an unresolved classification. "Unresolved" indicates that the classification remains uncertain and the coding field is blank; it is not a separate Analytic Construct Type code. Conceptual assignment does not itself establish quantitative eligibility or pooling inclusion; those statistical decisions are reported separately. *Table C.2 provides the source-specific reasons for the three unresolved classifications.

RQ1 classified and organized the author-reported leadership constructs, whereas RQ2 and RQ3 required both a defensible synthesized-dimension assignment and a usable quantitative result. Table C.2 in Appendix C identifies these cases and explains how each was treated.

Table C.2

Constructs Not Included in the Primary RQ2 and RQ3 Analyses

Study and author-reported construct	Classification in this study	Why it was not included in RQ2 and RQ3	How it was retained
Witziers et al. (2003) and Marzano et al. (2005): Visibility	Practice; no synthesized Dimension or Domain assigned	Visibility described leadership presence and contact, which could involve communication, support, monitoring, or instruction. The source descriptions did not identify one predominant area of leadership work.	The two estimates were combined as the recurring practice Visible and accessible leadership contact in RQ4.
Leithwood and Sun (2012): Modeling behavior	Practice; no synthesized Dimension or Domain assigned	Modeling included ethical example, credibility, trust, and willingness to reconsider one's own practice. This content crossed shared purpose, professional culture, and interpersonal support rather than representing one dimension.	Reported as an individual practice in RQ4.
Marzano et al. (2005): Communication	Practice; no synthesized Dimension or Domain assigned	Communication described maintaining channels and access to information across the school. It supported several areas of leadership work but did not represent one substantive dimension.	Reported as an individual practice in RQ4.

Study and author-reported construct	Classification in this study	Why it was not included in RQ2 and RQ3	How it was retained
Marzano et al. (2005): Flexibility	Practice; no synthesized Dimension or Domain assigned	Flexibility described adapting leadership behavior to circumstances and accepting dissent. Because it was cross-cutting rather than tied to one area of responsibility, it was not assigned to a dimension.	Reported as an individual practice in RQ4.
Scheerens et al. (2013): Monitoring	Practice; no synthesized Dimension or Domain assigned	The pooled estimate combined two different forms of monitoring: use of a school monitoring system and time teachers spent monitoring pupils' progress. Because those measures involve different actors and levels, the estimate could not be assigned to one leadership dimension. The source also reports inconsistent study counts: 43 studies in Table III but 25 studies in the narrative.	Reported as an individual practice in RQ4 using the Table III estimate (Fisher's z = 0.061; 43 studies; 194 within-study results; Cohen's d = 0.12 after conversion). The narrative instead reports 25 studies, so the count discrepancy is noted rather than reconciled.
Kyriakides et al. (2010): Teacher empowerment	Classification unresolved; no synthesized Dimension or Domain assigned	The source did not specify whether empowerment referred to decision authority, participation, autonomy, psychological empowerment, or another form of leadership work. The construct therefore could not be classified or assigned responsibly.	Retained in the RQ1 classification record; not included in the quantitative analyses.
Kyriakides et al. (2010): Autonomy	Classification unresolved; no synthesized Dimension or Domain assigned	The source did not establish whose autonomy was measured, the decisions it covered, or the organizational level. The construct therefore could not be classified or assigned responsibly.	Retained in the RQ1 classification record; not included in the quantitative analyses.

Study and author-reported construct	Classification in this study	Why it was not included in RQ2 and RQ3	How it was retained
Scheerens et al. (2013): Differentiation	Classification unresolved; no synthesized Dimension or Domain assigned	The source identified a school-level policy factor but did not establish whether the reported content represented leadership policy or teachers' adaptive instruction. The leadership function and level therefore remained unresolved.	Retained in the RQ1 classification record; not included in the quantitative analyses.
Ozdogru et al. (2025) and Ertem (2021): Distributed Leadership	broad approach/model; no synthesized Dimension or Domain assigned	These were broad leadership models spanning several areas of leadership work rather than single dimensions or practices. Their overall estimates therefore did not provide dimension-, domain-, or practice-level results.	Retained in the RQ1 classification record; not included in the dimension, domain, or practice analyses.
Brown (2001): Consideration	Dimension: Relational Support and Interpersonal Leadership; Domain: Create Culture and Conditions for Learning	Brown reported an effect, but the text and table conflict about which primary studies were included, the reported totals do not reconcile, and one listed effect is inconsistent with its reported interval. The estimate could not be used reliably in the pooled analysis.	The classification was retained; the reported estimate was documented but not pooled.
Kyriakides et al. (2010): Policy on teaching	Dimension: Integrated Leadership of Teaching and Learning; Domain: Lead Teaching and Learning	The reported value was a conditional meta-regression estimate for a specified reference group rather than an overall effect for Policy on teaching, and the number of contributing studies was not reported.	The classification was retained. Other separately reported factors from the same review were analyzed when their estimates met the quantitative requirements.

Study and author-reported construct	Classification in this study	Why it was not included in RQ2 and RQ3	How it was retained
Ertem (2021): Collaborative Leadership	Dimension: Shared Leadership and Joint Work; Domain: Build Collective Agency and Shared Responsibility	The estimate drew on the same two primary-study samples already represented in Uysal and Sarıer (2018), and an independent study count could not be recovered. Including both estimates would have counted the same evidence twice.	The classification was retained; Uysal and Sarıer (2018) supplied the quantitative contribution.
H. Wu and Shen (2026): Commitment and passion for school renewal; Safe and orderly school operation; High, cohesive, and culturally relevant expectations for students; Distributive and empowering leadership; Coherent curricular programs; Real-time and embedded instructional assessment; Data-informed decision-making	Each construct was assigned to the corresponding synthesized dimension and domain shown in Table C.1 in Appendix C.	These estimates substantially overlapped the primary studies included in H. Wu (2020). H. Wu supplied the primary analysis, so the two reviews were not entered together.	H. Wu and Shen's estimates were used only in the prespecified substitution analysis reported in Table D.4 in Appendix D.

Note. Practices with usable quantitative evidence remained eligible for RQ4 even when they were not assigned to a dimension. All dimension inputs included in RQ2 were carried into the corresponding domain analysis for RQ3; no additional construct was excluded between RQ2 and RQ3. Combined rows share the same classification and treatment.

Table C.3 reorganizes the 104 constructs assigned in Table C.1 by synthesized dimension and higher-order domain to make the composition of each dimension more accessible.

Table C.3

Complete Mapping of Author-Reported Constructs to Synthesized Leadership Dimensions

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Establish Purpose and Direction	Establishing Shared Purpose and Direction	Defining the mission Brown (2001)
		Developing a shared vision and build goal consensus Leithwood & Sun (2012)
		Focus Marzano et al. (2005)
		Ideals/Beliefs Marzano et al. (2005)
		Establishing goals and expectations Robinson et al. (2008)
		Building shared vision and values Tan et al. (2024)
		Defining and communicating mission Witziers et al. (2003)
		Developing instructional mission/tasks and goals J.-F. Wu (2020)
		Promoting a shared school vision, mission and goals of student learning Shen et al. (2020)
		Vision, Planning, and Management Meng (2018)
Lead Teaching and Learning	Integrated Leadership of Teaching and Learning	Instructional Organization Brown (2001)
		Instructional management Liebowitz & Porter (2019)
		Knowledge of Curriculum, Instruction, and Assessment Marzano et al. (2005)
		Planning, coordinating, and evaluating teaching and the curriculum Robinson et al. (2008)
		Enhancing teaching-and-learning Tan et al. (2024)

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Lead Teaching and Learning	Integrated Leadership of Teaching and Learning	Policy on teaching Kyriakides et al. (2010)
		Opportunity to learn Kyriakides et al. (2010)
		Quality of teaching Kyriakides et al. (2010)
		Ensuring curriculum and instructional quality J.-F. Wu (2020)
		Facilitating improvements in curriculum, instruction, and assessment Shen et al. (2020)
	Curriculum and Program Coherence	Involvement in Curriculum, Instruction, and Assessment Marzano et al. (2005)
		Coordinating and managing curriculum Witziers et al. (2003)
		Coherent curricular programs H. Wu (2020)
		Coherent curricular programs H. Wu & Shen (2026)
	Instructional Monitoring, Assessment, and Feedback	Supervision and evaluation Witziers et al. (2003)
		Monitoring Witziers et al. (2003)
		Real-time and embedded instructional assessment H. Wu (2020)
		Real-time and embedded instructional assessment H. Wu & Shen (2026)
		Student assessment Kyriakides et al. (2010)
Build Professional Expertise and Capacity	Professional Learning and Capacity Building	Providing intellectual stimulation Leithwood & Sun (2012)
		Intellectual Stimulation Marzano et al. (2005)
		Promoting and participating in teacher learning and development Robinson et al. (2008)
		Providing professional development Tan et al. (2024)
		Promoting teachers' professional growth J.-F. Wu (2020)

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Build Professional Expertise and Capacity	Professional Learning and Capacity Building	Promoting teachers' professional development Shen et al. (2020)
		Member Development and Training Meng (2018)
Create Culture and Conditions for Learning	High Expectations and Achievement Focus	Holding high performance expectations Leithwood & Sun (2012)
		Achievement orientation Witziers et al. (2003)
		High, cohesive, and culturally relevant expectations for students H. Wu (2020)
		High, cohesive, and culturally relevant expectations for students H. Wu & Shen (2026)
		Achievement orientation Scheerens et al. (2013)
		Enhancing students' learning climate J.-F. Wu (2020)
	Relational Support and Interpersonal Leadership	Consideration Brown (2001)
		Providing individualized support Leithwood & Sun (2012)
		Internal relations Liebowitz & Porter (2019)
		Relationships Marzano et al. (2005)
		Supportive Leadership Ozdogru et al. (2025)
		Advice and support Witziers et al. (2003)
		Supportive Leadership Ertem (2021)
		Interpersonal Relations and Communication Skills Meng (2018)
	Motivating and Sustaining Commitment	Inspiration Brown (2001)
		Contingent reward Leithwood & Sun (2012)
		Affirmation Marzano et al. (2005)

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Create Culture and Conditions for Learning	Motivating and Sustaining Commitment	Contingent Rewards Marzano et al. (2005)
		Optimizer Marzano et al. (2005)
		Motivating teachers Tan et al. (2024)
		Commitment and passion for school renewal H. Wu (2020)
		Commitment and passion for school renewal H. Wu & Shen (2026)
	Culture and Professional Community	Strengthening school culture Leithwood & Sun (2012)
		Change Agent Marzano et al. (2005)
		Culture Marzano et al. (2005)
		Fostering a collaborative culture in school Shen et al. (2020)
	Safe, Supportive, and Productive Conditions for Learning	Climate Brown (2001)
		Discipline Marzano et al. (2005)
		Ensuring an orderly and supportive environment Robinson et al. (2008)
		Safe and orderly school operation H. Wu (2020)
		Safe and orderly school operation H. Wu & Shen (2026)
		Quantity of teaching Kyriakides et al. (2010)
		School climate Kyriakides et al. (2010)
		Orderly climate Scheerens et al. (2013)
		Developing a supportive work environment J.-F. Wu (2020)
Build Collective Agency and Shared Responsibility	Shared Leadership and Joint Work	Building collaborative structures Leithwood & Sun (2012)
		Input Marzano et al. (2005)

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Build Collective Agency and Shared Responsibility	Shared Leadership and Joint Work	Empowering teachers Tan et al. (2024)
		Collaborative Leadership Uysal & Sarıer (2018)
		Distributive and empowering leadership H. Wu (2020)
		Distributive and empowering leadership H. Wu & Shen (2026)
		Collaboration Kyriakides et al. (2010)
		Collaborative Leadership Ertem (2021)
		Engaging in policy and decision making Shen et al. (2020)
Evaluate Impact and Use Evidence	Evidence-Informed Decision Making	Monitoring/Evaluating Marzano et al. (2005)
		Situational Awareness Marzano et al. (2005)
		Data-informed decision-making H. Wu (2020)
		Data-informed decision-making H. Wu & Shen (2026)
		Evaluation of policy on teaching Kyriakides et al. (2010)
		Evaluation and Research Meng (2018)
Steward the Organization and Its Environment	Resource Alignment	Resources Marzano et al. (2005)
		Strategic resourcing Robinson et al. (2008)
		Managing resources Tan et al. (2024)
		Technology and Infrastructure Support Meng (2018)
	Organizational Management and Operations	Management by exception Leithwood & Sun (2012)
		Organizational management Liebowitz & Porter (2019)
		Administration Liebowitz & Porter (2019)

Higher-order domain	Synthesized dimension	Assigned author-reported construct (source)
Steward the Organization and Its Environment	Organizational Management and Operations	Order Marzano et al. (2005)
		Redesigning the school Tan et al. (2024)
		School improvement Witziers et al. (2003)
		Resources and working conditions (e.g. salary) Kyriakides et al. (2010)
		Coordinating and managing beyond the classroom Shen et al. (2020)
	External Relations and Partnerships	External relations Liebowitz & Porter (2019)
		Outreach Marzano et al. (2005)
		Engaging families and community Tan et al. (2024)
		Managing external accountability and relationships Tan et al. (2024)
		Partnership policy Kyriakides et al. (2010)
		Improving outreach and collaboration with families and communities Shen et al. (2020)

Note. The table shows researcher-defined conceptual assignments of intact author-reported constructs and preserves the original author labels. Assignment does not by itself establish quantitative eligibility or inclusion in pooled results. Eleven constructs remained intentionally unassigned or unresolved and are not displayed. Some source reviews contain overlapping primary-study evidence, so repeated assignments do not establish independent quantitative contributions.

Appendix D - Source-Level Quantitative Contributions and Sensitivity Analysis

This appendix provides the source contributions underlying the dimension, domain, and recurring practice results in Chapter 4. Lowercase *k* identifies the weighting count for a source estimate; uppercase *K* identifies the total weighting count for a pooled result. These counts are not deduplicated totals of unique primary studies. Effects and pooled results are displayed to six decimal places for traceability; the calculations retain unrounded values.

Table D.1

Source-Level Contributions to Synthesized Dimension Results

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
Evidence-Informed Decision Making (4 meta-analyses)		**Overall *d* = 0.567586**	***K* = 53**
Marzano, Waters & McNulty (2005)	Monitoring/Evaluating + Situational Awareness	0.580043	36
Wu, H. (2020)	Data-informed decision-making	0.195000	4
Meng, Chia-Hui (2018)	Evaluation and Research	0.979444	7
Kyriakides et al. (2010)	Evaluation of policy on teaching	0.260733	6
Resource Alignment (4 meta-analyses)		**Overall *d* = 0.483692**	***K* = 45**
Marzano, Waters & McNulty (2005)	Resources	0.516398	17
Robinson, Lloyd & Rowe (2008)	Strategic resourcing	0.310000	7
Tan, Dimmock & Walker (2024)	Managing resources	0.262225	13
Meng, Chia-Hui (2018)	Technology and Infrastructure Support	0.926054	8

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
Culture and Professional Community (3 meta-analyses)		**Overall *d* = 0.441015**	***K = 34***
Leithwood & Sun (2012)	Strengthening school culture	0.060027	1
Marzano, Waters & McNulty (2005)	Change Agent + Culture	0.516398	21
Shen et al. (2020)	Fostering a collaborative culture in school	0.340844	12
Professional Learning and Capacity Building (7 meta-analyses)		**Overall *d* = 0.430799**	***K = 79***
Leithwood & Sun (2012)	Providing intellectual stimulation	0.100125	8
Marzano, Waters & McNulty (2005)	Intellectual Stimulation	0.494451	4
Robinson, Lloyd & Rowe (2008)	Promoting and participating in teacher learning and development	0.840000	6
Tan, Dimmock & Walker (2024)	Providing professional development	0.201008	32
Wu, Jin-Fu (2020)	Promoting teachers' professional growth	1.185806	6
Shen et al. (2020)	Promoting teachers' professional development	0.384938	15
Meng, Chia-Hui (2018)	Member Development and Training	0.861647	8
Establishing Shared Purpose and Direction (9 meta-analyses)		**Overall *d* = 0.426056**	***K = 156***
Brown (2001)	Defining the mission	0.220000	8
Leithwood & Sun (2012)	Developing a shared vision and build goal consensus	0.060027	7
Marzano, Waters & McNulty (2005)	Ideals/Beliefs + Focus	0.488494	51
Robinson, Lloyd & Rowe (2008)	Establishing goals and expectations	0.420000	7
Tan, Dimmock & Walker (2024)	Building shared vision and values	0.282785	52

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
Witziers, Bosker & Krüger (2003)	Defining and communicating mission	0.382290	6
Wu, Jin-Fu (2020)	Developing instructional mission/tasks and goals	1.154701	8
Shen et al. (2020)	Promoting a shared school vision, mission and goals of student learning	0.370183	9
Meng, Chia-Hui (2018)	Vision, Planning, and Management	0.857946	8
External Relations and Partnerships (5 meta-analyses)		**Overall *d* = 0.390758**	***K* = 55**
Liebowitz & Porter (2019)	External relations	0.081000	5
Marzano, Waters & McNulty (2005)	Outreach	0.560829	14
Tan, Dimmock & Walker (2024)	Engaging families and community + Managing external accountability and relationships	0.442130	11
Kyriakides et al. (2010)	Partnership policy	0.341640	21
Shen et al. (2020)	Improving outreach and collaboration with families and communities	0.299296	4
Relational Support and Interpersonal Leadership (7 meta-analyses)		**Overall *d* = 0.375161**	***K* = 65**
Leithwood & Sun (2012)	Providing individualized support	0.303433	6
Liebowitz & Porter (2019)	Internal relations	0.163000	14
Marzano, Waters & McNulty (2005)	Relationships	0.365978	11
Ozdogru, Sarier & Korucuoglu (2025)	Supportive Leadership	0.507599	15
Witziers, Bosker & Krüger (2003)	Advice and support	0.040003	11
Ertem (2021)	Supportive Leadership	0.771744	1
Meng, Chia-Hui (2018)	Interpersonal Relations and Communication Skills	1.061625	7

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
Shared Leadership and Joint Work (7 meta-analyses)		**Overall *d* = 0.360369**	***K = 115***
Leithwood & Sun (2012)	Building collaborative structures	0.345022	3
Marzano, Waters & McNulty (2005)	Input	0.516398	16
Tan, Dimmock & Walker (2024)	Empowering teachers	0.387050	27
Uysal & Sarıer (2018)	Collaborative Leadership	0.215236	2
Wu, H. (2020)	Distributive and empowering leadership	0.241000	16
Kyriakides et al. (2010)	Collaboration	0.321367	31
Shen et al. (2020)	Engaging in policy and decision making	0.372287	20
Integrated Leadership of Teaching and Learning (8 meta-analyses)		**Overall *d* = 0.358587**	***K = 151***
Brown (2001)	Instructional Organization	0.660000	12
Liebowitz & Porter (2019)	Instructional management	0.113000	28
Marzano, Waters & McNulty (2005)	Knowledge of Curriculum, Instruction, and Assessment	0.516398	10
Robinson, Lloyd & Rowe (2008)	Planning, coordinating, and evaluating teaching and the curriculum	0.420000	9
Tan, Dimmock & Walker (2024)	Enhancing teaching-and-learning	0.221343	30
Kyriakides et al. (2010)	Opportunity to learn + Quality of teaching	0.328135	39
Wu, Jin-Fu (2020)	Ensuring curriculum and instructional quality	1.217562	6
Shen et al. (2020)	Facilitating improvements in curriculum, instruction, and assessment	0.433862	17

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
Safe, Supportive, and Productive Conditions for Learning (7 meta-analyses)		**Overall *d* = 0.349223**	***K = 129***
Brown (2001)	Climate	0.290000	7
Marzano, Waters & McNulty (2005)	Discipline	0.560829	12
Robinson, Lloyd & Rowe (2008)	Ensuring an orderly and supportive environment	0.270000	8
Wu, H. (2020)	Safe and orderly school operation	0.155000	6
Kyriakides et al. (2010)	Quantity of teaching + School climate	0.275201	42
Scheerens, Witziers & Steen (2013)	Orderly climate	0.258716	46
Wu, Jin-Fu (2020)	Developing a supportive work environment	1.217562	8
Curriculum and Program Coherence (3 meta-analyses)		**Overall *d* = 0.311440**	***K = 38***
Marzano, Waters & McNulty (2005)	Involvement in Curriculum, Instruction, and Assessment	0.408248	23
Witziers, Bosker & Krüger (2003)	Coordinating and managing curriculum	0.040003	10
Wu, H. (2020)	Coherent curricular programs	0.409000	5
Motivating and Sustaining Commitment (5 meta-analyses)		**Overall *d* = 0.287482**	***K = 89***
Brown (2001)	Inspiration	0.400000	3
Leithwood & Sun (2012)	Contingent reward	0.020001	1
Marzano, Waters & McNulty (2005)	Affirmation + Contingent Rewards + Optimizer	0.428518	32
Tan, Dimmock & Walker (2024)	Motivating teachers	0.201008	43
Wu, H. (2020)	Commitment and passion for school renewal	0.201000	10

Study	Author construct(s)	Source effect (*d*)	Weighting count (*k*)
High Expectations and Achievement Focus (5 meta-analyses)		**Overall *d* = 0.287161**	***K* = 82**
Leithwood & Sun (2012)	Holding high performance expectations	0.160514	7
Witziers, Bosker & Krüger (2003)	Achievement orientation	0.040003	13
Wu, H. (2020)	High, cohesive, and culturally relevant expectations for students	0.107000	6
Scheerens, Witziers & Steen (2013)	Achievement orientation	0.282935	50
Wu, Jin-Fu (2020)	Enhancing students' learning climate	1.185806	6
Organizational Management and Operations (7 meta-analyses)		**Overall *d* = 0.233971**	***K* = 71**
Leithwood & Sun (2012)	Management by exception	-0.100125	1
Liebowitz & Porter (2019)	Organizational management + Administration	0.084000	13
Marzano, Waters & McNulty (2005)	Order	0.516398	17
Tan, Dimmock & Walker (2024)	Redesigning the school	0.120217	12
Witziers, Bosker & Krüger (2003)	School improvement	-0.100042	8
Kyriakides et al. (2010)	Resources and working conditions (e.g. salary)	0.280916	13
Shen et al. (2020)	Coordinating and managing beyond the classroom	0.363877	7
Instructional Monitoring, Assessment, and Feedback (3 meta-analyses)		**Overall *d* = 0.137902**	***K* = 61**
Witziers, Bosker & Krüger (2003)	Supervision and evaluation + Monitoring	0.053531	37
Wu, H. (2020)	Real-time and embedded instructional assessment	0.174000	12
Kyriakides et al. (2010)	Student assessment	0.361947	12

Note. Each meta-analysis contributes once to a dimension result. A plus sign joins intact author constructs combined within the same meta-analysis. Source effects and pooled *d* values are displayed to six decimal places; *k* and *K* retain their integer weighting counts. For Kyriakides et al. (2010), evaluation of policy on teaching retains the source qualification that the available studies often assessed student evaluation more narrowly than the full policy-evaluation-and-improvement process.

Table D.2

Higher-Order Domain Results and Within-Meta-Analysis Combinations

Study	Underlying synthesized dimension(s)	Source-level domain effect (*d*)	Summed *k*
D6 Evaluate Impact and Use Evidence (4 meta-analyses)		**Overall *d* = 0.567586**	***K* = 53**
Marzano, Waters & McNulty (2005)	Evidence-Informed Decision Making	0.580043	36
Wu, H. (2020)	Evidence-Informed Decision Making	0.195000	4
Meng, Chia-Hui (2018)	Evidence-Informed Decision Making	0.979444	7
Kyriakides et al. (2010)	Evidence-Informed Decision Making	0.260733	6
D3 Build Professional Expertise and Capacity (7 meta-analyses)		**Overall *d* = 0.430799**	***K* = 79**
Leithwood & Sun (2012)	Professional Learning and Capacity Building	0.100125	8
Marzano, Waters & McNulty (2005)	Professional Learning and Capacity Building	0.494451	4
Robinson, Lloyd & Rowe (2008)	Professional Learning and Capacity Building	0.840000	6
Tan, Dimmock & Walker (2024)	Professional Learning and Capacity Building	0.201008	32
Wu, Jin-Fu (2020)	Professional Learning and Capacity Building	1.185806	6

Study	Underlying synthesized dimension(s)	Source-level domain effect (*d*)	Summed *k*
Shen et al. (2020)	Professional Learning and Capacity Building	0.384938	15
Meng, Chia-Hui (2018)	Professional Learning and Capacity Building	0.861647	8
D1 Establish Purpose and Direction (9 meta-analyses)		**Overall *d* = 0.426056**	***K = 156***
Brown (2001)	Establishing Shared Purpose and Direction	0.220000	8
Leithwood & Sun (2012)	Establishing Shared Purpose and Direction	0.060027	7
Marzano, Waters & McNulty (2005)	Establishing Shared Purpose and Direction	0.488494	51
Robinson, Lloyd & Rowe (2008)	Establishing Shared Purpose and Direction	0.420000	7
Tan, Dimmock & Walker (2024)	Establishing Shared Purpose and Direction	0.282785	52
Witziers, Bosker & Krüger (2003)	Establishing Shared Purpose and Direction	0.382290	6
Wu, Jin-Fu (2020)	Establishing Shared Purpose and Direction	1.154701	8
Shen et al. (2020)	Establishing Shared Purpose and Direction	0.370183	9
Meng, Chia-Hui (2018)	Establishing Shared Purpose and Direction	0.857946	8
D5 Build Collective Agency and Shared Responsibility (7 meta-analyses)		**Overall *d* = 0.360369**	***K = 115***
Leithwood & Sun (2012)	Shared Leadership and Joint Work	0.345022	3
Marzano, Waters & McNulty (2005)	Shared Leadership and Joint Work	0.516398	16
Tan, Dimmock & Walker (2024)	Shared Leadership and Joint Work	0.387050	27

Study	Underlying synthesized dimension(s)	Source-level domain effect (*d*)	Summed *k*
Uysal & Sarıer (2018)	Shared Leadership and Joint Work	0.215236	2
Wu, H. (2020)	Shared Leadership and Joint Work	0.241000	16
Kyriakides et al. (2010)	Shared Leadership and Joint Work	0.321367	31
Shen et al. (2020)	Shared Leadership and Joint Work	0.372287	20
D7 Steward the Organization and Its Environment (9 meta-analyses)		**Overall *d* = 0.350115**	***K = 171***
Leithwood & Sun (2012)	Organizational Management and Operations	-0.100125	1
Liebowitz & Porter (2019)	Organizational Management and Operations; External Relations and Partnerships	0.083167	18
Marzano, Waters & McNulty (2005)	Resource Alignment; Organizational Management and Operations; External Relations and Partnerships	0.529357	48
Robinson, Lloyd & Rowe (2008)	Resource Alignment	0.310000	7
Tan, Dimmock & Walker (2024)	Resource Alignment; Organizational Management and Operations; External Relations and Partnerships	0.269860	36
Witziers, Bosker & Krüger (2003)	Organizational Management and Operations	-0.100042	8
Kyriakides et al. (2010)	Organizational Management and Operations; External Relations and Partnerships	0.318422	34
Shen et al. (2020)	Organizational Management and Operations; External Relations and Partnerships	0.340393	11
Meng, Chia-Hui (2018)	Resource Alignment	0.926054	8
D4 Create Culture and Conditions for Learning (15 meta-analyses)		**Overall *d* = 0.334744**	***K = 399***
Brown (2001)	Motivating and Sustaining Commitment; Safe, Supportive, and Productive Conditions for Learning	0.323000	10

Study	Underlying synthesized dimension(s)	Source-level domain effect (*d*)	Summed *k*
Leithwood & Sun (2012)	High Expectations and Achievement Focus; Relational Support and Interpersonal Leadership; Motivating and Sustaining Commitment; Culture and Professional Community	0.201615	15
Liebowitz & Porter (2019)	Relational Support and Interpersonal Leadership	0.163000	14
Marzano, Waters & McNulty (2005)	Relational Support and Interpersonal Leadership; Motivating and Sustaining Commitment; Culture and Professional Community; Safe, Supportive, and Productive Conditions for Learning	0.464640	76
Ozdogru, Sarier & Korucuoglu (2025)	Relational Support and Interpersonal Leadership	0.507599	15
Robinson, Lloyd & Rowe (2008)	Safe, Supportive, and Productive Conditions for Learning	0.270000	8
Tan, Dimmock & Walker (2024)	Motivating and Sustaining Commitment	0.201008	43
Witziers, Bosker & Krüger (2003)	High Expectations and Achievement Focus; Relational Support and Interpersonal Leadership	0.040003	24
Wu, H. (2020)	High Expectations and Achievement Focus; Motivating and Sustaining Commitment; Safe, Supportive, and Productive Conditions for Learning	0.162818	22
Kyriakides et al. (2010)	Safe, Supportive, and Productive Conditions for Learning	0.275201	42
Scheerens, Witziers & Steen (2013)	High Expectations and Achievement Focus; Safe, Supportive, and Productive Conditions for Learning	0.271330	96
Wu, Jin-Fu (2020)	High Expectations and Achievement Focus; Safe, Supportive, and Productive Conditions for Learning	1.203952	14
Ertem (2021)	Relational Support and Interpersonal Leadership	0.771744	1

Study	Underlying synthesized dimension(s)	Source-level domain effect (*d*)	Summed *k*
Shen et al. (2020)	Culture and Professional Community	0.340844	12
Meng, Chia-Hui (2018)	Relational Support and Interpersonal Leadership	1.061625	7
D2 Lead Teaching and Learning (10 meta-analyses)		**Overall *d* = 0.297573**	***K = 250***
Brown (2001)	Integrated Leadership of Teaching and Learning	0.660000	12
Liebowitz & Porter (2019)	Integrated Leadership of Teaching and Learning	0.113000	28
Marzano, Waters & McNulty (2005)	Integrated Leadership of Teaching and Learning; Curriculum and Program Coherence	0.441021	33
Robinson, Lloyd & Rowe (2008)	Integrated Leadership of Teaching and Learning	0.420000	9
Tan, Dimmock & Walker (2024)	Integrated Leadership of Teaching and Learning	0.221343	30
Witziers, Bosker & Krüger (2003)	Curriculum and Program Coherence; Instructional Monitoring, Assessment, and Feedback	0.050653	47
Wu, H. (2020)	Curriculum and Program Coherence; Instructional Monitoring, Assessment, and Feedback	0.243118	17
Kyriakides et al. (2010)	Integrated Leadership of Teaching and Learning; Instructional Monitoring, Assessment, and Feedback	0.336091	51
Wu, Jin-Fu (2020)	Integrated Leadership of Teaching and Learning	1.217562	6
Shen et al. (2020)	Integrated Leadership of Teaching and Learning	0.433862	17

Note. The analysis included 18 multi-dimension within-meta-analysis combinations: 16 primary combinations represented here and two substitution combinations included in Table D.4 in Appendix D. Other primary rows carry forward one dimension estimate. Each meta-analysis

contributes once to a domain result. Final domain results were calculated from these source-level contributions, not by averaging pooled dimension results.

Table D.3

Source-Level Contributions to Recurring Practice Results

Study	Author-reported practice	Source effect (*d*)	Weighting count (*k*)
P01: Setting and sustaining school goals (2 meta-analyses)		**Overall *d* = 0.480992**	***K = 50***
Witziers, Bosker & Krüger (2003)	Defining and communicating mission	0.382290	6
Marzano, Waters & McNulty (2005)	Focus	0.494451	44
P04: Contingent recognition and reward (2 meta-analyses)		**Overall *d* = 0.447006**	***K = 10***
Leithwood & Sun (2012)	Contingent reward	0.020001	1
Marzano, Waters & McNulty (2005)	Contingent Rewards	0.494451	9
P02: Visible and accessible leadership contact (2 meta-analyses)		**Overall *d* = 0.361734**	***K = 16***
Witziers, Bosker & Krüger (2003)	Visibility	0.160171	3
Marzano, Waters & McNulty (2005)	Visibility	0.408248	13
P03: Intellectual stimulation for professional inquiry (2 meta-analyses)		**Overall *d* = 0.231567**	***K = 12***
Leithwood & Sun (2012)	Providing intellectual stimulation	0.100125	8
Marzano, Waters & McNulty (2005)	Intellectual Stimulation	0.494451	4

Note. These eight contributions underlie the four recurring practice results. The 25 individual nonpooled practice findings are reported in Table 4.5.

Table D.4 in Appendix D reports the prespecified substitution analysis using H. Wu and Shen (2026) in place of H. Wu (2020).

Table D.4

Wu Substitution Sensitivity Results

Level	Analysis	H. Wu (2020) *d* / *k*	H. Wu & Shen (2026) *d* / *k*	Primary pooled effect (*d*)	Substitution pooled effect (*d*)	Signed change in *d*
Dimension	Curriculum and Program Coherence	0.409000 / 5	0.303000 / 5	0.311440	0.297493	-0.013947
Dimension	Instructional Monitoring, Assessment, and Feedback	0.174000 / 12	0.197000 / 13	0.137902	0.143307	+0.005405
Dimension	High Expectations and Achievement Focus	0.107000 / 6	0.169000 / 7	0.287161	0.290220	+0.003058
Dimension	Motivating and Sustaining Commitment	0.201000 / 10	0.235000 / 11	0.287482	0.290677	+0.003195
Dimension	Safe, Supportive, and Productive Conditions for Learning	0.155000 / 6	0.231000 / 8	0.349223	0.350899	+0.001676
Dimension	Shared Leadership and Joint Work	0.241000 / 16	0.278000 / 17	0.360369	0.364762	+0.004393
Dimension	Evidence-Informed Decision Making	0.195000 / 4	0.073000 / 7	0.567586	0.532376	-0.035210
Domain	D2 Lead Teaching and Learning	0.243118 / 17	0.226444 / 18	0.297573	0.296161	-0.001413
Domain	D4 Create Culture and Conditions for Learning	0.162818 / 22	0.216000 / 26	0.334744	0.336469	+0.001725

Level	Analysis	H. Wu (2020) *d* / *k*	H. Wu & Shen (2026) *d* / *k*	Primary pooled effect (*d*)	Substitution pooled effect (*d*)	Signed change in *d*
Domain	D5 Build Collective Agency and Shared Responsibility	0.241000 / 16	0.278000 / 17	0.360369	0.364762	+0.004393
Domain	D6 Evaluate Impact and Use Evidence	0.195000 / 4	0.073000 / 7	0.567586	0.532376	-0.035210

Note. The H. Wu and Shen (2026) estimates replace the corresponding H. Wu (2020) estimates in each substitution; the two reviews do not enter the same pooled result simultaneously. Effects and signed changes are displayed to six decimal places, and *k* retains exact integer counts. Signed change is the substitution pooled *d* minus the primary pooled *d*.

Appendix E - Detailed Contextual Evidence for RQ5

This appendix presents the contextual evidence supporting RQ5 at two complementary levels. Table E.1 in Appendix E summarizes contextual coverage across the 17 included meta-analyses, and Table E.2 in Appendix E summarizes the evidence linked to dimensions. The synthesis is descriptive and exploratory. The distinctions between contextual descriptions, subgroup estimates, and formal moderator tests follow Chapter 3.

Table E.1

Study-Level Contextual Evidence Inventory

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
Brown (2001)	Yes	School level; School setting	2	Broad leadership/model-level	Student outcomes and school effectiveness were combined, so the findings are broad rather than dimension-specific. The reported post-hoc statistics contain an internal numerical inconsistency.
Robinson et al. (2008)	No	Countries and school levels described	0	Descriptive sample context; no contextual moderator analysis	Leadership-type and dimension comparisons are not contextual moderation; the source's context table is descriptive only.

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
Witziers et al. (2003)	Yes	School level; Geography / country / region	9	Broad leadership/model-level; Dimension-specific	Blank cells in Table 4 are treated as unspecified, not null findings. Practice-level results retain the underlying construct's analytic type and, where applicable, its synthesized-dimension assignment.
Leithwood & Sun (2012)	Yes	School level	1	Broad leadership/model-level	Only the school-level conclusion for student learning is retained; governance findings concern other outcomes.
Liebowitz & Porter (2019)	Yes	School level (subgroups only); Geography / country / region	4	Dimension-specific; Multiple dimensions / broad construct	School-level results are subgroup estimates without a formal difference test. The country finding appears only as a broad footnote conclusion, so construct-specific contrasts cannot be verified.
Tan et al. (2024)	Yes	School level; SES / poverty; Other contextual moderator	3	Multiple dimensions / broad construct	Outcomes combine student measures; *n* refers to effects. Actor position and methodological moderators are outside the RQ5 context scope.

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
Marzano et al. (2005)	Yes	School level; SES / poverty; School setting; Other contextual moderator	4	Broad leadership/model-level	SES, ethnicity, and school-setting comparisons were based on sparse subgroups; effects were reliability corrected.
H. Wu (2020)	Yes	School level	2	Broad leadership/model-level	This source overlaps substantially with H. Wu and Shen (2026). Source significance markings at $p < .10$ were not treated as $p < .05$ findings.
H. Wu & Shen (2026)	Yes	School level; School setting	29	Broad leadership/model-level; Dimension-specific; Multiple dimensions / broad construct	Direct and indirect pathways are reported separately; rural and suburban schools are combined; some subgroups have small *k*. Safe and orderly school operation maps to safe, supportive, and productive conditions for learning.

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
Kyriakides et al. (2010)	Yes	School level; Geography / country / region	10	Broad leadership/model-level; Dimension-specific; Multiple dimensions / broad construct	Only construct-specific tests are linked to synthesized dimensions; results for the broader Policy on Teaching construct are not extended to its components. The population qualification is retained, and two climate findings map to safe, supportive, and productive conditions for learning.
Scheerens et al. (2013)	Yes	School level; Geography / country / region	8	Broad leadership/model-level; Dimension-specific; Not linked to a synthesized Dimension	Monitoring remains unassigned to a synthesized dimension, and broad Educational leadership remains separate. Two Orderly Climate findings map to safe, supportive, and productive conditions for learning, with the narrow condition-based interpretation retained.

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
J.-F. Wu (2020)	No	Taiwan sample described	0	Descriptive sample context; no contextual moderator analysis	Pooled dimension results and heterogeneity are not contextual moderation; a Taiwan-only sample describes coverage rather than country moderation.
Uysal & Sarıer (2018)	Yes	School level; Geography / country / region	3	Broad leadership/model-level	The source reports 68 datasets from 39 publications. Turkey school-level subgroup estimates do not include a Turkey-specific difference test.
Ozdogru et al. (2025)	Yes	School level; Geography / country / region	4	Broad leadership/model-level	School-climate moderator results were outside the leadership-context question. Insufficient evidence prevented SES and school-size moderator tests.
Ertem (2021)	Tests combine student and teacher outcomes	School level (mixed outcome only); Geography / country / region (mixed outcome only)	0	Mixed-outcome contextual tests; student outcome not separable	Context tests combine teacher motivation and academic achievement, so student-outcome moderation cannot be separated.

Study	Contextual analysis status	Contextual categories examined	RQ5-relevant findings	Evidence scope	Limits on interpretation
Shen et al. (2020)	Yes	School level	1	Broad leadership/model-level	The grade comparison concerns broad teacher leadership, not seven separate dimensions. A U.S.-only sample describes coverage rather than country moderation.
Meng (2018)	Tests concern overall school effectiveness	School size (mixed outcome only); Geography / country / region (mixed outcome only); Other contextual moderator (mixed outcome only)	0	Whole-model school-effectiveness tests	Size, region, and school-history tests concern overall technology leadership with overall school effectiveness, so no student-learning moderator result can be separated.

Note. Absence of a reported contextual analysis is a coverage finding, not evidence that context has no influence. SES = socioeconomic status.

Table E.2

Contextual Evidence by Synthesized Dimension

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
Establishing Shared Purpose and Direction	1 source: Witziers et al. (2003)	Geography / country / region	Witziers et al. (2003) mission: other countries lower than USA; source marks bivariate result robust. School-level cell unspecified.	Evidence comes from one practice-level result and is sparse; it cannot be generalized to the full synthesized dimension or treated as a whole-dimension moderator test.
High Expectations and Achievement Focus	3 sources: Witziers et al. (2003); H. Wu & Shen (2026); Scheerens et al. (2013)	School level; School setting; Geography / country / region	Witziers et al. (2003) achievement orientation: lower secondary, higher other-country effects; practice scope. H. Wu & Shen (2026): grade difference not statistically significant; setting difference statistically significant for the indirect pathway but not for the direct pathway. Scheerens et al. (2013): grade unmarked; Netherlands coefficient negative at .05.	Three sources provide the most direct coverage, including one practice-level source. The evidence is not a whole-dimension test and does not support a universal context ranking.

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
Integrated Leadership of Teaching and Learning	2 sources: Liebowitz & Porter (2019); Kyriakides et al. (2010)	School level; Geography / country / region	Liebowitz & Porter (2019) Instructional Management school-level subgroups only. Kyriakides et al. (2010) Policy on Teaching grade $p = .117$ and country coefficients not statistically significant.	Evidence is sparse: one source provides a formal test and one provides subgroup-only evidence. Policy moderation applies to the tested umbrella construct, not each component.
Curriculum and Program Coherence	1 source: H. Wu & Shen (2026)	School level	H. Wu & Shen (2026) curricular programs: grade $F = 0.38$, $p = .545$; no usable setting/indirect test. Witziers et al. (2003) contextual cells unspecified.	Evidence is sparse and limited to construct-specific findings. A non-significant test is not evidence of invariance.
Instructional Monitoring, Assessment, and Feedback	2 sources: Witziers et al. (2003); H. Wu & Shen (2026)	School level; School setting; Geography / country / region	Witziers et al. (2003) supervision: lower secondary and higher other-country effects; practice scope. H. Wu & Shen (2026) assessment: grade difference not statistically significant; rural/suburban higher in direct and indirect pathways.	Two linked sources provide some direct evidence, one at the practice level; these are not whole-dimension tests. Monitoring from Scheerens et al. (2013) remains unassigned and is not added here.
Professional Learning and Capacity Building	0 sources	None	No construct-specific contextual result in the retained evidence.	Meng's whole-model result cannot be transferred to Member Development and Training.

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
Relational Support and Interpersonal Leadership	1 source: Liebowitz & Porter (2019)	School level	Liebowitz & Porter (2019) Internal relations: elementary 0.073, secondary 0.165; no formal difference test. Witziers et al. (2003) Advice/support cells unspecified.	Evidence is limited to subgroup estimates from one source; no formal moderator difference was tested.
Motivating and Sustaining Commitment	1 source: H. Wu & Shen (2026)	School level; School setting	H. Wu & Shen (2026) commitment and passion for school renewal: grade difference not statistically significant; setting indirect $p = .018$, direct $p = .074$.	Evidence is sparse and pathway-specific for one intact author construct, with the overlap between H. Wu (2020) and H. Wu and Shen (2026) and the direct/indirect pathway distinctions retained; no recurring cross-source conclusion is supported.
Culture and Professional Community	0 sources	None	No construct-specific contextual result in the retained evidence.	Ozdogru's school-climate moderation is not a test of leadership culture and professional community.

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
Safe, Supportive, and Productive Conditions for Learning	3 sources: H. Wu & Shen (2026); Kyriakides et al. (2010); Scheerens et al. (2013)	School level; School setting; Geography / country / region	H. Wu & Shen (2026) Safe Operation grade and setting tests were not statistically significant. Kyriakides et al. (2010) climate grade $p = .41$, Netherlands negative and Asian positive source-marked country coefficients. Scheerens et al. (2013) Orderly Climate grade/country coefficients unmarked; source reports no significant moderators.	Three sources provide construct-specific formal tests. Direct/indirect pathway and condition-versus-actor distinctions remain; no universal context ranking is supported.
Resource Alignment	0 sources	None	No construct-specific contextual result in the retained evidence.	Meng's whole-model context tests cannot be transferred to Technology and Infrastructure Support.
Organizational Management and Operations	1 source: Liebowitz & Porter (2019)	School level	Liebowitz & Porter (2019) Organizational Management elementary 0.030 versus secondary 0.083, subgroup-only.	Evidence is limited to subgroup estimates from one source; no formal moderator difference was tested.

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
Evidence-Informed Decision Making	1 source: H. Wu & Shen (2026)	School level; School setting	H. Wu & Shen (2026) Data-informed decision-making: formal school-level tests were non-significant for direct (F = 1.98, p = .165) and indirect (F = 1.64, p = .214) pathways. Location tests comparing urban with combined rural/suburban schools were also non-significant: direct F = *0.*51, p = .504; indirect F = 3.88, p = .069. Numerical subgroup differences do not establish moderation. Small subgroup k and the overlap with H. Wu (2020) remain relevant to interpretation.	One source provides construct-specific tests, but no contrast reached $p < .05$. Small subgroup k and limited power constrain interpretation; no broader dimension-level context pattern is established.
Shared Leadership and Joint Work	2 sources: H. Wu & Shen (2026); Kyriakides et al. (2010)	School level; School setting; Geography / country / region	H. Wu & Shen (2026) distributive/empowering: grade difference not statistically significant; setting direct p = .019 and indirect p = .004. Kyriakides et al. (2010) Collaboration: grade p = .741; Asian versus USA p = .042.	Two sources provide construct-linked formal tests, but they do not establish one common context effect.

Synthesized dimension	Dimension-specific sources	Contextual factors represented	Dimension-specific contextual evidence	RQ5 interpretation
External Relations and Partnerships	1 source: Kyriakides et al. (2010)	School level; Geography / country / region	Kyriakides et al. (2010) Partnership policy: secondary $p = .058$; Asian versus USA $p = .041$.	One source provides direct country-specific evidence; the school-level contrast remains uncertain.

Note. Dimension-specific evidence requires construct-specific linkage. Practice-level evidence linked to a dimension does not become a test of the entire dimension.