

A Systematic Analysis of Quantitative Studies on teachers' Leadership Styles

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Abstract

Leadership plays a central role in the effectiveness and sustainability of education systems. Understanding and developing effective and context-appropriate leadership styles is a priority for both research and education policy. The aim of this article is to systematically synthesize the quantitative literature indexed in the Web of Science (WOS) on teacher leadership styles and their impact on educational outcomes, using the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) methodology. The methodology included searching the WOS Core Collection database for the period 1990–2026 and selecting quantitative empirical studies investigating teacher leadership styles and their impact. After applying the inclusion/exclusion criteria, 87 studies were analyzed. The results show that transformational leadership is the most frequently investigated, followed by distributed and instructional leadership. Leadership styles have significant effects on teachers' subjective well-being, organizational commitment, and innovative behavior, with these relationships being mediated by self-efficacy, trust, and job satisfaction. The findings highlight a diversification of theoretical frameworks and an urgent need for longitudinal studies and cross-cultural research. The article provides a comprehensive mapping of the field and directions for future research.

Keywords: education, educational leadership, pedagogy, teacher, leadership styles, systematic analysis.

JEL classification: J2, F6, I2

DOI: 10.24818/RMCI.2026.2.289

1. Introduction

Educational leadership is a determinant of the quality of education systems, influencing both school performance and teacher well-being (Karaferye & Bellibas, 2025). In the last two decades, research has increasingly focused on the leadership styles adopted by school principals and teacher leaders, highlighting their role in shaping school climate and organizational behavior (Ahmed, 2025).

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However, the existing literature is fragmented, using various measurement instruments and addressing different styles, which makes it difficult to aggregate results. The field of educational leadership faces important methodological challenges: high heterogeneity, lack of longitudinal studies, limited geographical focus, and the predominant use of convenience samples. Although qualitative studies are numerous, systematic quantitative syntheses remain limited. Transformational, instructional, distributed, and servant leadership are associated with a wide range of positive outcomes for teachers: job satisfaction, well-being, self-efficacy, organizational commitment, organizational citizenship behavior, and instructional innovation. Mediating mechanisms, particularly self-efficacy, trust, and collaboration, are essential to understanding how leaders exert influence.

A recent meta-analysis has highlighted significant effects of leadership on teachers' innovative behavior (Umalihayati et al., 2026), but an overview of leadership styles studied quantitatively is lacking.

This systematic review aims to synthesize quantitative studies indexed in the Web of Science (WOS) that investigate teacher leadership styles, using the PRISMA guideline for reporting. The specific objectives of this study are:

O1: to analyze the thematic evolution and scientific performance in the field of teacher leadership, based exclusively on quantitative research;

O2: to identify the most frequently studied leadership styles;

O3: to synthesize the direct and indirect effects of these styles on teacher-related outcomes;

In line with the aforementioned objectives, we addressed the following research questions:

RQ1: How has quantitative research on teacher leadership styles evolved over time (2000-2024) and what are the most important bibliometric benchmarks (annual output, countries, institutions and dominant journals)?

RQ2: What are the main teacher leadership styles investigated in quantitative studies indexed in the Web of Science?

RQ3: What are their effects on teacher-related outcomes (well-being, engagement, self-efficacy, innovative behavior, etc.)?

These questions structure both the narrative synthesis and the assessment of the quality of the studies, being aligned with the PRISMA guideline and the specifics of the Web of Science database.

2. Literature review

2.1 Leadership Styles in Education

Over the past five decades, research in the field has demonstrated that the way school principals and teacher leaders perform their roles has profound consequences for school climate, teacher motivation, and ultimately student outcomes. Educational leadership research has evolved from trait- and behavior-focused models to more complex paradigms that emphasize the contextual and

distributed nature of leadership. In the 1980s and 1990s, transformational and instructional theories dominated the field, but in the past two decades, the focus has shifted to distributed, ethical, and authentic models, reflecting a more nuanced understanding of how leaders influence school organizations (Hallinger et al., 2025). The literature identifies four major theoretical frameworks that guide this field:

1. Transformational leadership, based on the concepts of Bass and Avolio (1994), emphasizes inspiration and intellectual stimulation. Research has shown that this style positively influences organizational behavior (Ahmed, 2024), teacher self-efficacy (Ozdogru et al., 2025), and teaching innovation (Umalihayati et al., 2026). Specific dimensions, such as intellectual stimulation and individualized consideration, are considered the most predictive of positive teacher attitudes.

2. Instructional leadership focuses on curriculum management, instructional supervision and promoting teacher professional development. A meta-analysis by Hallinger, Liu, and Chen (2025) of 68 studies found a moderate and significant correlation between principals' instructional leadership and teacher attitudes ($r = 0.450$). The strongest associations were with trust in the leader ($r = 0.615$), followed by organizational commitment ($r = 0.420-0.500$), and job satisfaction ($r = 0.430-0.480$). These results suggest that although instructional leadership focuses on the teaching-learning process, its primary mechanism of action is relational.

3. Distributed leadership, promoted by Harris Spillane et al. (2008), is seen as an emergent practice from interactions between teachers and students and is characterized by high teacher autonomy, organizational effectiveness, and the importance of moral integrity. Research indicates that distributing leadership responsibilities between principals and teachers improves collective self-efficacy, trust, and school innovation. A latent class study by Bellibaş et al. (2024) identified integrated leadership profiles, in which distributed leadership practices coexist with instructional ones, producing superior effects on teacher engagement.

4. Servant and ethical leadership are relatively more recent in the educational literature, emphasizing serving the needs of teachers and their moral integrity. A significant recent contribution is that of Bellibaş and Kaya (2025), who, through a meta-analysis of 39 studies (170,693 participants), found that servant leadership has the largest effect size in relation to job satisfaction, surpassing transformational, distributed, and empowering styles.

Based on empirical research conducted on 62 school principals and 348 teachers from urban and rural schools, Minoiu et al. (2025) propose a framework for ethical school leadership, based on psychological theory and contextualized in the Romanian educational system. The framework includes six core components: value articulation, emotional climate regulation, participatory governance, ethical and well-being-focused professional development, distributed leadership, and reflective institutional practices.

2.2 The Impact of Leadership on Teachers

Job satisfaction is one of the most frequently studied dependent variables. Bellibaş and Kaya's (2025) meta-analysis confirmed that all positive leadership styles have significant effects, but to varying degrees. A qualitative meta-synthesis by Karaferye and Bellibaş (2025) identified four main themes of leadership practices that promote teacher well-being: (1) teacher autonomy and agency; (2) positive relationships and work environment; (3) opportunities for professional and personal growth; and (4) proactive support for well-being.

Teacher self-efficacy acts as both an important outcome and a mediator of leadership effects. Ozdogru et al. (2025) showed that instructional, transformational, and distributed leadership have moderate direct effects on self-efficacy, which in turn significantly influences student outcomes. Trust in the leader is most strongly mediated by instructional leadership, with a correlation of 0.615 in the meta-analysis by Hallinger et al. (2025). However, Popovici and Mironov (2019) bring a quantitative approach to self-efficacy (Efficacy and personal beliefs in teaching), arguing that under certain conditions a potential overestimation of one's own efficacy can generate a discrepancy between the perception of preparation and the real quality of educational practices.

Ahmed's (2024) systematic review summarized how leadership styles influence teachers' organizational citizenship behavior. Both transformational and distributed leadership were associated with higher levels of teachers' above-contractual behavior. This effect is partially mediated by trust and job satisfaction, which are considered essential for school functioning.

A meta-analysis by Umalihayati et al. (2026) examined the influence of leadership on teachers' innovative behavior in digital teaching. All leadership styles had significant positive effects, with visionary leadership showing the largest effect size ($*g* = 0.89$), followed by transformational ($*g* = 0.72$) and distributed ($*g* = 0.65$). These findings highlight the role of leadership in facilitating adaptation to emerging technologies.

The general literature review confirms that leadership styles play a central role in the effectiveness and sustainability of education systems. Empirical research on teacher leadership, school climate, and perceived value integration indicates that transformational and participative leadership styles, when consciously aligned with psychological needs such as autonomy, competence, and relatedness, significantly improve the perceived ethical coherence and emotional stability of the school environment (Minoiu et al., 2025). Transformational, instructional, distributed and servant leadership are associated with a wide range of positive outcomes for teachers: job satisfaction, well-being, self-efficacy, organizational commitment, organizational citizenship behavior and instructional innovation.

The article by Popovici and Mironov (2019) is relevant to the topic of educational leadership through the concept of Teacher Leadership Attitudes, which reflects a concern for how teachers perceive their own role as leaders within the school community.

However, the field faces important methodological challenges: high heterogeneity, lack of longitudinal studies, limited geographical focus and the predominant use of convenience samples. In the context of rapid change in education systems, understanding how school leaders can support teacher effectiveness and well-being remains a research priority. This review provides both a stocktaking of the accumulated knowledge and a compass for future investigations.

3. Methodology

3.1 Data Extraction and Processing

The review followed the PRISMA 2020 guidelines (Page et al., 2021). Regarding the eligibility criteria, the characteristics of the included studies were clearly specified, using the PICOS format adapted to the educational context. As a result, the following inclusion criteria were formulated:

1. Population (P): pre-university and university teachers, school principals, teacher leaders),

2. Intervention/exposure (I): any defined teacher leadership style examined quantitatively, including but not limited to: transformational, instructional, distributed, servant, authentic, ethical, democratic, transactional, and cultural leadership styles.

3. Comparator (C): another leadership style, a control group, or no exposure as included studies could examine relationships without comparison groups.

1. Outcomes (O): quantitative measures of outcomes at the teacher level (e.g., self-efficacy, job satisfaction, commitment), at the school level (e.g., organizational climate, collaborative practices), or at the student level (e.g., academic performance, engagement).

2. Study design (S): quantitative empirical studies, including cross-sectional, longitudinal designs that address various leadership styles used by teachers.

The search was conducted in the Web of Science Core Collection in January 2026. The search strategy combined terms specific to educational leadership with style terms and methodological filters.

The search is conducted in the Web of Science Core Collection, including the SSCI, SCI-Expanded, A&HCI and ESCI indexes, to cover relevant interdisciplinary literature. The search strategy combines controlled terms and free keywords, grouped into three main areas:

1. educational leadership: "teacher leader", "school leader", "principal", "head teacher";
2. leadership styles: "transformational leadership", "instructional leadership", "distributed leadership", "ethical leadership", "authentic leadership", "servant leadership", "leadership style";

3. methodological filters: "quantitative", "survey", "structural equation modeling", "SEM", "latent profile", "meta-analysis".

Boolean operators (AND, OR) and wildcard characters () are used to maximize search sensitivity, and results are limited to articles (Article), English language and the period 1990-2026.

Therefore, the search formula was defined as follows:

(TS=("school leader" OR "educational administrator" OR "principal" OR "teacher leader" OR "head teacher"))

AND TS=("transformational leadership" OR "instructional leadership" OR "distributed leadership" OR "ethical leadership" OR "authentic leadership" OR "servant leadership" OR "leadership style")

AND TS=("quantitative" OR "survey" OR "structural equation modeling" OR "SEM" OR "latent profile" OR "meta-analysis")

AND DT=(Article)

AND LA=(English)

AND PY=(1990-2026)

The systematic literature search followed the methodological guidelines for systematic reviews in educational research (Zawacki-Richter et al., 2020). To ensure the relevance of the corpus, the raw results were filtered in two stages, based on the inclusion and exclusion criteria in Table 1.

Inclusion and exclusion criteria

Table 1

No	Inclusion criteria	Exclusion criteria
1	Indexed in Web of Science	Not indexed in Web of Science
2.	Must include: quantitative, teacher, leadership, education	Not include: quantitative, teacher, leadership, education,
3.	English	Not in English
4	Published between 1990 to march 2026	published before 1990
5.	Open acces	Not Open acces
6.	Document type: article, early access, proceeding paper,	book, chapters, letter, published retracted meeting abstract review, data paper, review article
7.	Publications related to teacher leadership and pedagogy	Non-education publications: Health Policy Services, Medicine Research Experimental, Medicine General Internal, Meteorology Atmospheric Sciences, Nursing, Nutrition Dietetics, Stem cell research, Sciences Services,

Source: own elaboration

The exclusion criteria include: qualitative studies, editorials, narrative reviews, books and book chapters, as well as works that do not report sufficient statistical data or do not use validated instruments for measuring leadership styles.

The extracted data included: author(s), year, country, educational level, leadership styles investigated, measurement instruments, sample, design,

dependent variables, main statistical results (coefficients, effect sizes), mediator/moderator variables.

Systematic searches conducted between January and March 2026 identified 4116 records. Refining the corpus of papers according to inclusion and exclusion criterion 2 in Table 1 (must include: quantitative, teacher, leadership, education) generated a total of 598 papers. According to criteria 3 and 4, only 524 articles published in English-language journals, between 2000–2026, indexed in the Web of Science Core Collection, were included. After applying criterion 5 (Open access papers), only 272 articles were identified for the next stages. Refining the search according to criterion 6 (Type document: Article, Early Access, Proceeding Paper) eliminated 16 records, keeping 256 papers for analysis. Eliminating papers according to WOS categories and focusing only on the educational field, according to criterion 7, generated 240 articles for systematic analysis. We note that the automatic and manual verification did not identify any duplicates, confirming the uniqueness of the corpus for subsequent analyses.

Data collection followed two stages: initial selection based on titles, abstracts and keywords, followed by full-text review. In the first stage of screening, based on titles and abstracts, 107 studies were excluded, most of which were Theoretical papers, editorials, book reviews, dissertations or Studies focusing exclusively on principal/administrative leadership without teacher leadership components

In the second stage of screening, 133 records were fully reviewed, eliminating qualitative studies without quantitative components and works investigating constructs other than leadership styles. The application of the basic conceptual criteria generated a corpus of 87 publications that met the inclusion criteria for meta-analysis (Figure 1).

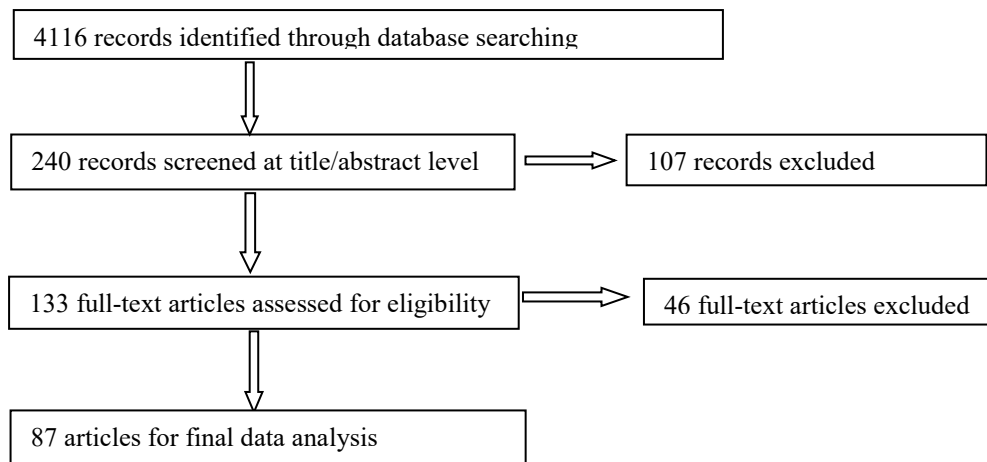


Figure 1. The PRISMA diagram

Source: Authors' own research, based on data extracted from WoS

The analysis used a set of dedicated software tools. Evolution and Performance (Q1) was carried out with the bibliometrix package in R (Biblioshiny interface), for the analysis of indicators related to the annual number of publications and citations, sources and . Also, for a clear picture of the geographical distribution and the most productive journals, we used VOSviewer 1.6.20. The identification of thematic cores was achieved by analyzing keyword clusters (co-currentity), also with VOSviewer. To highlight the thematic evolution of pedagogical leadership, we used the “Overlay Visualization” function in R Bibliometrix, starting from the keyword map. This methodological combination allowed the scientific mapping of the entire field in order to study the impact of various educational styles. Referring to Q2 and Q3, we used a narrative synthesis, complemented by summary tables, due to the high heterogeneity of designs, instruments and outcomes. Thus, for studies that reported effect sizes, these were grouped by leadership styles and outcome categories.

4. Results and Discussion

4.1 Main Information About the Articles

The systematic data identification and refinement procedure generated a final corpus of 87 documents, developed by 280 authors from 56 sources and comprising 5147 bibliographic references. Table 3 briefly presents the structural characteristics of this corpus by processing the database in the R (Biblioshiny) application.

Main Information about the Articles

Table 3

Nr.	Description	Results
1	Timespan	1990-2026 (March)
2	Sources	56
3	Documents	87
4	Cited Articles	529
5	Times Cited	545
6	Average citations per document	6.26
7	Annual growth Rate %	13.65%
8	References	5147
9	H-index	12
10	Author's Keywords (DE)	411
11	Keywords plus (ID)	206
12	Authors	280
13	Single-authored docs	14
14	Co-Authors per doc	3.28
15	International co-authorships %	16.09
16	article	76
17	article; early access	4
18	Proceedings paper	7

Source: own elaboration

Terminological fragmentation (411 Keywords and 206 Keywords Plus) and the predominance of occasional authors suggest a maturing, rather than a stabilized, scientific community. The moderate h-index (12) and high number of citations (5147 for only 87 documents) indicate that the core of influential works is still small.

4.2 Performance Analysis and Thematic Evolution of Quantitative Articles on Teacher Leadership Styles (Q1)

The 87 studies were published between 1990 and 2026, with a sharp increase after 2019. The annual number of publications revealed an exponential increase in both the number of quantitative studies and their citations (Figure 2). The year-on-year growth rate, as well as the increasing number of citations in the last 3 years (2023-78 citations, 2024-121 citations, 2025-181 citations) reflect the growing interest in researching topics related to the importance of leadership styles present in educational systems in different regions.

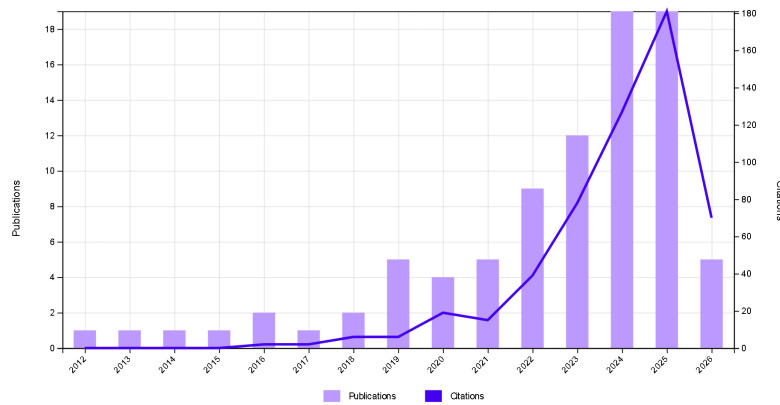


Figure 2. Times Cited and Publications Over Time

Source: Authors' own research, based on data extracted from WoS

The examination of the most relevant dimensions of scientific productivity and intellectual influence focused on five fundamental hierarchies. These are the following: countries – reflecting the global geography of research, institutions – seen as true centers of excellence, academic journals – as the main channels of dissemination, and most cited articles – which exert the most profound impact on the intellectual development of the field.

Top 5 performances in the field (1990-2026)

Table 3

Category	1	2	3	4	5
Countries (articles)	Spain (9)	China (8)	USA (7)	Ethiopia (6)	Malaysia (6)

Category	1	2	3	4	5
Most relevant article by citations	Al Ajmi (2022)- 85 citations	Messmann et al. (2022)-68 citations	Andreasen et al (2019)-47 citations	Dalati et al. (2017)-35 citations	Maqbool et al. (2023)-24 citations
Journals (articles)	Education Sciences (9)	Frontiers in Education (9)	Cogent Education (6)	Educational Management Administration Leadership (3)	Problems of Education in The 21st Century (3)
Organizations (articles)	University Granada-Spain (7)	Univ. Malaysia (6)	University Free State-South Africa (5)	University Latvia (5)	Near East University-Cyprus (4) Southwest University China(4)

Source: Authors' own research, based on data extracted from WoS

Based on the data provided, the hierarchy of publications by country reveals some interesting aspects. Spain, with 9 publications, is a clear leader in this area of school leadership and teacher leadership styles, with a strong tradition in quantitative educational research. There are well-established research groups (Universities of Granada, Seville or Barcelona) that frequently apply validated scales (such as the MLQ – Multifactor Leadership Questionnaire) to large samples of teachers. China invests heavily in educational reforms and in the professionalization of teaching staff. Quantitative studies on teacher leadership styles are common, as they lend themselves to collecting data on large samples (e.g. in urban or rural school districts). Chinese interest often focuses on the relationship between leadership style (transformational, transactional, laissez-faire) and student performance or teacher well-being. The small difference compared to Spain suggests a high but not dominant productivity, possibly due to language barriers in publishing in top Western journals. Given that many of the fundamental tools and theories on educational leadership (e.g., the work of Bass, Avolio, Leithwood) originated in the US, the American presence in third place is unexpected. One possible explanation is that American research has recently shifted more towards mixed methods or qualitative methods, or towards related topics (school climate, social justice), and strictly quantitative studies on teacher leadership styles may be fewer than in the past. Ethiopia and Malaysia, developing countries with a centralized education system, are showing increased interest in improving the quality of teaching through leadership. Quantitative studies on teacher leadership styles are popular among master's and doctoral students because the methodology is relatively accessible (validated questionnaires, standard statistical analyses). The atypical distribution, with Spain and China in the foreground (Figure 3), does not indicate a weakness in American research, but rather a regional specialization of interest in the field of teacher leadership styles.

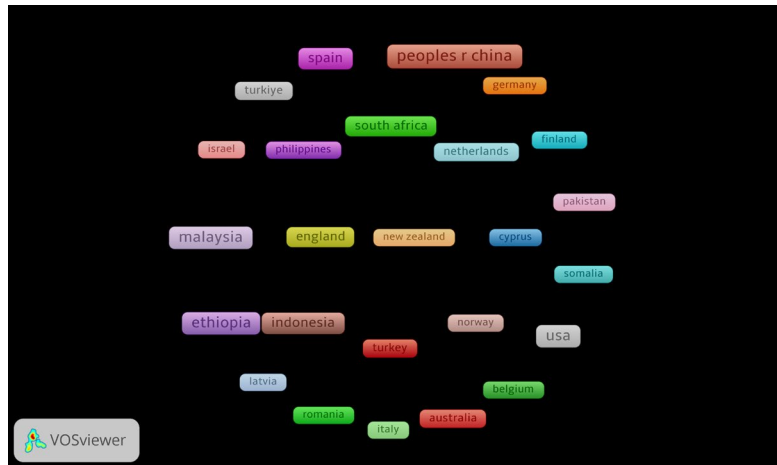


Figure 3. Network of publications by country

Source: Authors' own research, based on data extracted from Wosviewer

The presence of Ethiopia and Malaysia also reflects a democratization of research: the subject is methodologically accessible and relevant globally, not just in traditional centers of scientific power.

Regarding the most influential articles (Figure 4), we can see that the first two places are occupied by articles from 2022, and the fifth place by an article from 2023, indicating a recent explosion of interest in teacher leadership styles, in crisis situations, hybrid teaching, socio-emotional support. Thus, Al Ajmi (2022) addresses an acute and extremely current issue, namely the forced transition to distance learning in the pandemic context, providing empirical evidence from a less explored geographical context (the Middle East).

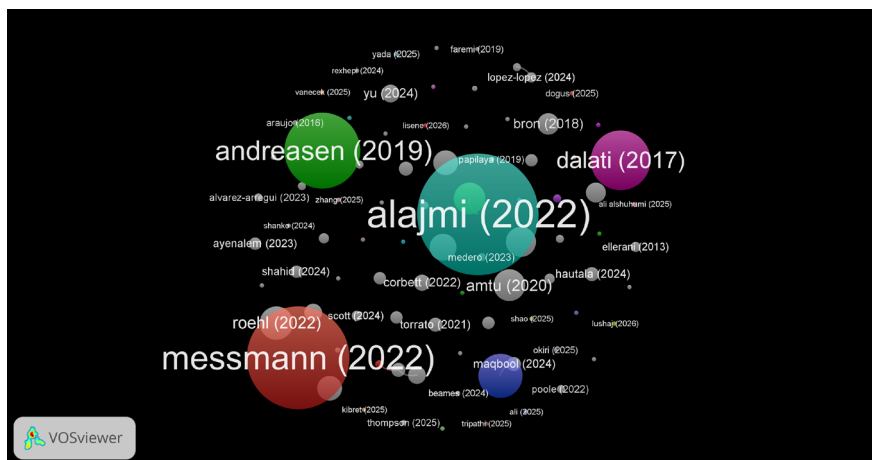


Figure 4. Publication network based on the most influential articles by citations

Source: Authors' own research, based on data extracted from Wosviewer

Messmann et al. (2022) investigate how transformational leadership influences innovative behavior in the workplace in non-profit organizations (such as schools), with the novelty of introducing self-determination theory as an explanatory mechanism. The study demonstrates that transformational leadership is positively associated with the satisfaction of teachers' fundamental psychological needs (especially autonomy and mediator competence), which in turn stimulates innovative behavior. Andreasen et al. (2019), with 47 citations, complements the other two works by focusing on the identity and professional development of the teacher educator, rather than on the impact of leadership on actual performance.

In this sense, the thematic evolution of the field can be divided into three distinct stages, as seen in Figure 5, highlighting two clear transitions and a third phase of formation.

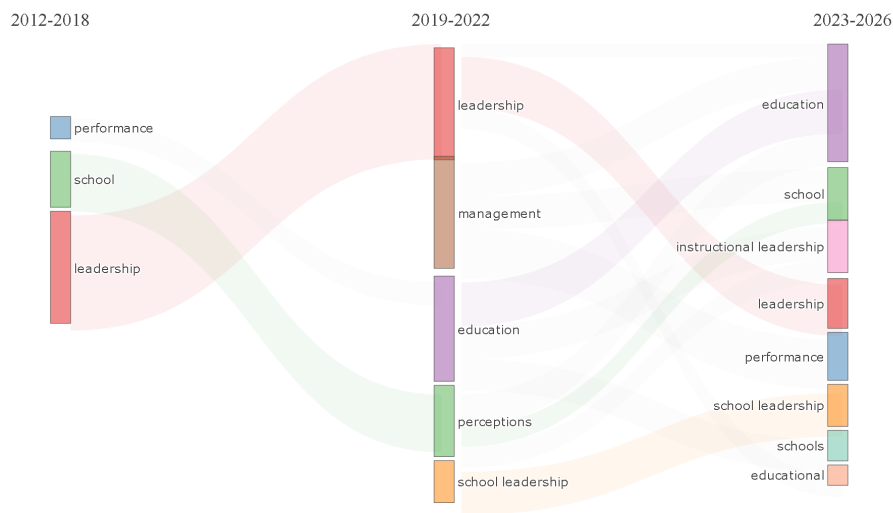


Figure 5. Diachronic analysis of thematic evolution: Tracking the stability, ramification and emergence of research clusters in the period 2012-2026

Source: Authors' own research, based on data extracted from WoS (Biblioshiny application).

The thematic analysis identified three distinct periods:

- Emergent phase (2012-2018): average 1.8 publications/year; the role of pedagogical leadership (Ellerani & Gentile 2013) and identification of the main leadership styles in education (Crețu, 2015a);
- Growth phase (2019-2022): average 8.4 publications/year; expanding empirical studies on the impact of transformational and instructional leadership on educational institutions (Atalay et al., 2019) and their

importance for improving student learning outcomes and teacher performance (Amtu et al. 2021);

- Expansion phase (2023-2026): average 16.3 publications/year; methodological sophistication, global spread and addressing related themes, such as teachers' perspectives on inclusion, the impact of the emergence of AI technology on educational practices (Caneva et al. (2023) or the importance of digital leadership in teacher training (Chaidir et al., 2025).

Thematic analysis applied to the generative period, covering the period 2020 to the present, carried out using the Overlay function of the Biblioshiny tool (see Figure 6), clearly highlights those research directions that are emerging, that is, emerging as new frontiers in the field.

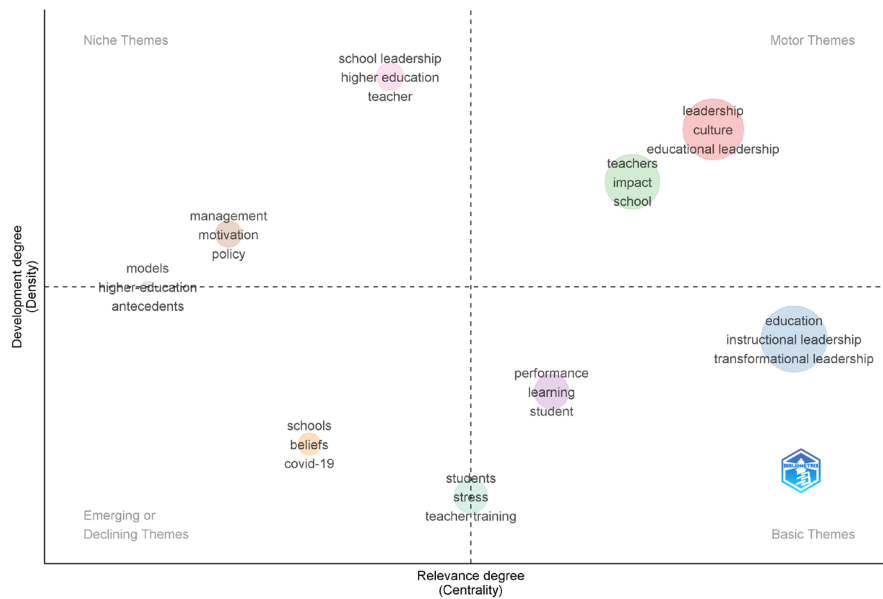


Figure 6. Thematic evolution in the most recent period (2020-2025): visualization of keyword co-occurrence patterns and emergence of new research directions

Source: Authors' own research, based on data extracted from WoS (Biblioshiny application).

We observe that the fundamental, well-established themes of didactic leadership are related to performance, student learning, instructional leadership, transformational leadership. These have a high central importance, but are still poorly developed internally. Thus, student performance and learning constitute the ultimate criterion of school effectiveness, suggesting that any leadership model must relate to them, but research no longer treats them as novelties.

The emergence of the two leadership styles (transformational and instructional) as basic themes confirms their importance in the field, especially in primary and secondary schools, but no longer represents a frontier of innovation.

Although they are “basic” themes, they are not completely resolved, due to the complexity of these concepts that involve dependent variables (student performance) and numerous mediating variables (teacher self-efficacy, school climate).

The driving themes are those that generated the largest number of publications and citations, while also providing a theoretical framework for other well-developed themes and being strongly connected to the rest of the field. In this quadrant we have topics related to leadership culture, educational leadership, the impact of teachers on the school.

Leadership culture is a determining theme because it integrates socio-psychological dimensions (climate, trust) with leadership practices. The quantitative studies analyzed show how organizational culture mediates the effects of leadership on outcomes.

The impact of teachers on the school highlights the fact that the attention of research is no longer limited to the direct effects of the principal, but analyzes how leadership shapes the self-efficacy, commitment and behaviors of teachers, who, in turn, influence the school.

Niche topics (school leadership, management, motivation, policies) are important to a small community of researchers, but do not directly influence the mainstream of the discipline. Although school leadership is a central topic, in bibliometric analysis, the term is used in a narrower sense, especially in case studies or in specific national contexts (leadership in small, rural, private schools). School management is a niche topic because it intersects with organizational psychology, being developed in the subfield of school reform and principal retention. Motivation is a niche topic because, although it is a well-known and often invoked concept, in the specialized literature it has the role of mediator or dependent variable, being considered a related but not central topic. Instead of being the central question of the research, motivation is often the “missing link” that explains how leadership produces effects. A broad bibliometric analysis, examining 5208 articles from the Web of Science and Scopus databases, identified motivation as one of the most frequent keywords, but the dominant theme driving the research analyzed is “transformational leadership”. Policy refers to educational policies (standards, assessment, funding) and is a topic treated separately from quantitative studies on teacher leadership styles, suggesting that it is not fully integrated into the core of educational leadership.

The unique positioning of the topic “student modeling in higher education”, on the border between emerging and niche topics, is due to the fact that it presents characteristics of both emerging and niche topics. Thus, this positioning reflects a paradigm shift from traditional hierarchical models to decentralized approaches, such as distributed and relational ones, but also an orientation towards particular contexts (e.g. Ethiopian, African universities).

Emerging themes of recent times (school beliefs, COVID-19, student stress, teacher education) represent new but underdeveloped trends that have emerged in response to recent events (pandemic) or new social challenges.

COVID-19 is clearly an emerging theme, generated by the health crisis. However, meta-analyses and unifying theories are lacking, as this theme is not strongly linked to classical constructs (transformational leadership, organizational culture) but is concerned with topics such as safety or online teaching. Student stress, especially in the context of school closures, online exams, and social isolation, is an emerging theme, as student stress has traditionally been associated with educational psychology rather than leadership. Now, educational researchers are starting to analyze how principals and teachers can reduce student stress by adopting a specific leadership style.

The topic of “school beliefs” is emerging because it represents a paradigm shift in educational leadership research, from an exclusive focus on behaviors and practices, to understanding the cognitions, beliefs, and value systems that guide the decisions of the entire school community. An analysis shows how, to be effective, school leaders must abandon static and deficient thinking, adopting a dynamic and appreciative one, which reflects the complexity of living systems. Teachers’ belief in their own ability to succeed is a vehicle through which leadership style influences student outcomes and indirectly contributes to academic performance. Teacher training appears as an emerging topic because it refers to new forms of training: digital skills training, training for inclusive education, training to respond to student stress. The pandemic has also accelerated the need for technological training, which has generated a wave of new but unconsolidated research. An emerging direction, reflected in recent work (Umalihayati et al., 2026), focuses on how school leaders can support digital innovation and the integration of AI into teaching practices. An increase in studies examining leadership in the context of the intersection of education and technology and their impact on teaching practices and styles is expected.

4.3 Leadership Styles Analyzed Through Quantitative Studies in WoS between 1990-2026 (Q2)

The approach to the second question led to the identification of the main leadership styles of teachers investigated in quantitative studies indexed in the Web of Science and their frequency, as presented in Table 1.

Frequency of leadership styles in quantitative studies in WoS

Table 4

Leadership styles	Number of studies	Percentage
Transformational Leadership	58	66,7 %
Distributed Leadership	27	31,03 %
Instructional Leadership	24	27,6 %
Servant Leadership	11	12,6
Participatory / Democratic Leadership	10	11,5 %
Ethical Leadership	9	10,3 %

Leadership styles	Number of studies	Percentage
Authentic Leadership	9	10,3 %
Transactional Leadership	7	8,2 %
Visionary Leadership	6	6,9 %
Laissez-Faire Leadership	5	5,7 %
Autocratic Leadership	5	5,7 %

Note: Some studies have investigated multiple styles.

Source: Authors' own research, based on data extracted from WoS

The frequency of teacher leadership styles investigated in quantitative studies indexed in the Web of Science shows that the most frequently investigated styles are Transformational Leadership, Distributed Leadership, and Instructional Leadership. This is supported by multiple bibliometric analyses quantifying their presence in the literature, with dedicated reviews identifying hundreds of WoS articles for each style (Gumus et al., 2016).

In the second category we mention styles with a moderate frequency, such as: servant leadership and democratic leadership.

We can also observe emerging styles, such as ethical leadership, authentic leadership, transactional leadership which have a moderate frequency, but are often studied in relation to teacher motivation and organizational climate, rather than as an independent teacher leadership style.

On the other hand, visionary leadership is less common, with quantitative studies typically using researcher-developed questionnaires and focusing on Southeast Asian contexts. Finally, autocratic and laissez-faire leadership styles appear only occasionally, often as comparative categories in studies of principal or teacher leadership in the classroom, rather than as a primary focus of investigation.

Four studies used latent class analysis to identify leadership profiles at the teacher or principal level. Karaferye and Bellibas (2025) identified three leadership profiles at the teacher-leader level: "limited" (reduced leadership practices), "in transition" (some practices), and "integrated" (extensive practices). Schools with an "integrated" profile recorded the highest levels of teacher self-efficacy and commitment.

4.4 Effects of Leadership Styles Analyzed in Quantitative Studies in WoS

Using keyword co-citation and co-occurrence techniques, we conducted a chromatic and semantic analysis of the quantitative research landscape on educational leadership in VOSviewer, identifying both established paradigms and emerging directions. The 411 keywords used by the authors of the 87 articles were distributed into 5 clusters, who reflect the main research directions on the impact of teacher leadership styles on educational outcomes, teacher well-being, and organizational effectiveness (Figure 7).

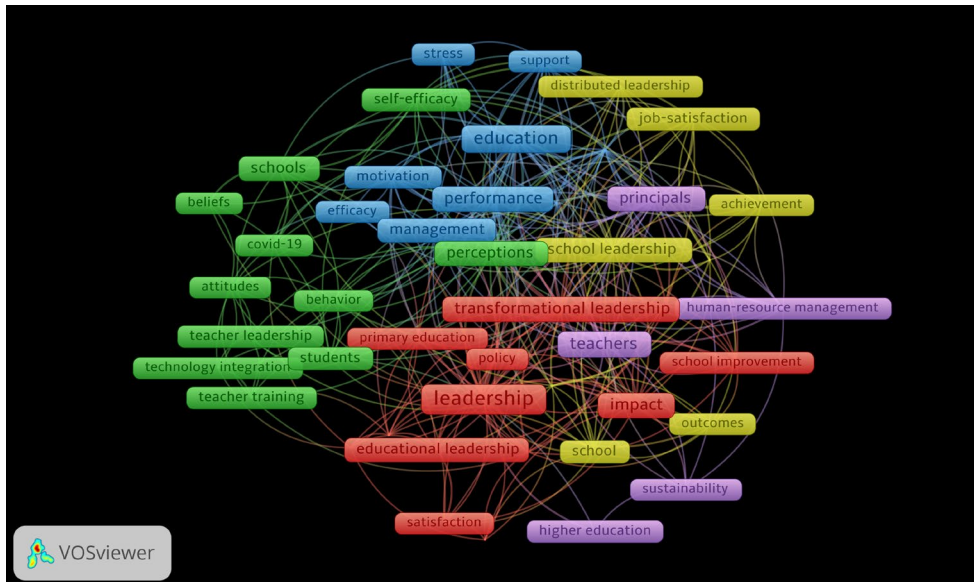


Figure 7. Cluster network using the most used Keywords

Source: Authors' own research, based on data extracted from Wosviewer

The red cluster, with transformational leadership at the center, represents the dominant paradigm of research in this field, generating measurable effects at the level of the entire school unit, not just at the individual level. This type of Leadership produces systemic improvements, mediated by teacher satisfaction, being a privileged vehicle for implementing educational policies, although most analyses focus exclusively on primary education.

Research in the blue cluster documents another important phenomenon, namely that intensive instructional leadership, focused on frequent classroom observation, detailed feedback, curriculum monitoring) can simultaneously generate. This model produces dual effects: it increases effectiveness and motivation, but it can also generate stress through supervision and pressure for performance. The term support is the key to resolving the paradox, having a moderating role. Therefore, if instructional leadership is accompanied by genuine emotional and professional support, the negative effects on stress are mitigated, and motivation and effectiveness are maximized.

The green cluster is oriented towards emerging themes, such as pedagogical innovation and teacher professional development. The simultaneous presence of the terms "beliefs", "attitudes" and "self-efficacy" reveals a well-established theoretical model in which instructional leadership operates by transforming teachers' internal beliefs, which in turn shape attitudes towards innovation and, ultimately, teaching behaviors.

The most significant finding of this cluster is the association between instructional leadership and the integration of technology in education, with reference to their roles in adopting and promoting technology, but also to the need

for technological literacy components in their training. The yellow cluster (centralized distributed leadership) is unique in that it includes both intermediate variables (job satisfaction) and final variables (achievements, results). Unlike the red cluster (transformational - systemic impact) and the blue cluster (instructional - effectiveness and stress), distributed leadership is specifically associated with measurable student outcomes. This leadership style produces positive student outcomes (academic and other outcomes), and this effect is mediated by teacher job satisfaction.

In contrast to the other clusters, the purple cluster (principals, teachers, human resources, sustainability) focuses on effects on teachers, with principals and teachers appearing as equal entities. In other words, principal leadership influences teachers through human resources practices, and this relationship is increasingly evaluated in terms of sustainability, both of individual careers and of institutions as a whole. This reflects a recent research direction that links educational leadership to both organizational and educational sustainability.

Based on quantitative analyses, the leadership styles identified produce a spectrum of effects on teaching staff. Table 5 presents the main significant associations reported.

Significant effects of leadership styles on dependent variables

Table 5

Dependent Variable	Leadership styles positively associated	Effect size (range)
Well-being	Distributed, Visionary, Transformational, Supportive, Authentic	$\beta = 0,45- 0,96$
Job Satisfaction	Transformational, Democratic, Ethical, Authentic,	$\beta = 0,28- 0,48$
Teacher Collaboration	Transformational, Authentic, Distributed	$\beta = 0,28-0,52$
Organizational Commitment	Distributed, Transformational, Laissez-Faire	$r = 0,38-0,78$
Teacher Self-Efficacy	Instructional, Transformational, Distributed	$\beta = 0,24-0,69$
Performance and Effectiveness	Democratic, Autocratic, Transformational, Authentic, Visionary, Laissez-Faire	$\beta =0,52-0,58$
Innovative Work Behavior	Visionary, Authentic, Transformational, Distributed	$g = 0,53$

Source: Authors' own research, based on data extracted from WoS

Note: β = standardized regression coefficient; r = Pearson correlation; g = Hedges g (effect size).

The most robust effects were reported for transformational leadership on job satisfaction and organizational commitment. A recent meta-analysis (Umalihayati et al., 2026) indicated that visionary leadership has the greatest influence on teachers' innovative behavior ($g = 0.89$), compared to transformational ($g = 0.72$) and distributed ($g = 0.65$).

One of the most studied effects refers to the improvement of well-being at work, which has a significant direct effect on teachers' job satisfaction, further amplified by a favorable school climate, collaboration and trust.

Transformational leadership is considered the most effective, having a positive and far-reaching impact, establishing a supportive school culture that leads to multiple outcomes: teachers' job satisfaction, involvement and self-efficacy. Among the mediating effects associated with this leadership style, we mention the reduction of stress related to the teacher role both directly and indirectly, through affective commitment, as well as the positive impact on teacher performance and innovative behavior in the workplace. Transformational leadership has been associated with the mental health of employees in online education. Shi (2025) reports an absolute beta value of 0.50, but does not specify the significance level. In the same study, passive leadership (which includes *laissez-faire* style) is negatively correlated with mental health, with a correlation coefficient of $r = -0.467$.

Distributed leadership has consistently demonstrated strong and positive effects on several outcomes among teachers. A study using the Shanghai TALIS dataset found a significant direct effect of distributed leadership on teachers' self-efficacy ($\beta = 0.33$, $p < 0.001$), as well as a strong direct association with well-being at work (standard $\beta = 0.51$, $p < 0.001$) (Liu & Werblow, 2019). Another study confirmed a significant direct effect on job satisfaction ($\beta = 0.404$, $p < 0.001$) in the Czech educational context (Šípová & Lazarová, 2025). A meta-analysis also found a "highly statistically significant correlation" between distributed leadership and teacher job satisfaction (Hulpia et al., 2011). Research using data on teachers in Turkey also reported a positive and significant effect of distributed leadership on teacher collaboration (Korkmaz, 2022). In addition, a 2023 study found that distributed leadership encourages innovative behavior in the workplace by satisfying teachers' basic psychological needs for autonomy, competence, and relatedness (Van der Voet & Steijn, 2023).

The results on instructional leadership have been remarkably mixed and context-dependent. An analysis of PISA 2022 data revealed a significant negative effect of instructional leadership on science scores ($\beta = -33.26$, $p = 0.01$), suggesting that in some contexts, a strong emphasis on instructional leadership could be detrimental to student performance (OECD, 2023). In contrast, a multilevel model showed a positive relationship between instructional leadership and instructional quality ($\beta = 0.117$, $p < 0.001$) (Bellibas & Liu, 2017). Regarding teacher self-efficacy, one study reported a non-significant positive effect ($\beta = 0.242$, $p = 0.521$) (Gümüş & Bellibas, 2020).

Authentic leadership positively affects teachers' well-being and job satisfaction, but its effects are indirect, operating through professional autonomy and organizational trust. In the field of medical education, de Almeida and Trevizan (2025) reported that total authentic leadership significantly predicts job satisfaction of higher education teachers, with a beta coefficient of 0.48. Liu and Werblow (2024) also investigated the effect of authentic leadership on teachers'

organizational commitment, showing that it explains a significant proportion of the variance in organizational commitment, with a beta coefficient of 0.094 ($p < 0.001$). Participatory/democratic leadership is strongly preferred by teachers and predicts job satisfaction and performance, but its frequency in the literature is lower than the first three styles. This style consistently exhibits positive associations with performance, as seen in its high positive impact on academic performance and a beta of 0.581 on employee performance. It is often perceived as the most prevalent and favorable style in educational settings. However, a case study of 507 respondents on the prevailing leadership styles in the Romanian pre-university education system (primary and secondary) shows that collaborative, participative leadership only works with teams capable of developing ideas and putting them into practice (Crețu, 2015b).

Visionary leadership exhibits significant direct effects on teacher performance, engagement, and creativity, but the volume of quantitative studies remains modest compared to transformational leadership. A strong effect of visionary leadership has been reported on teachers' attitudes toward work. Sina et colab. (2025) found a beta coefficient of 0.902 ($t = 80.128, p < 0.001$) for this relationship in a study conducted in primary schools. In the same study, visionary leadership had a significant, but more moderate, effect on organizational performance ($\beta = 0.305, t = 6.889, p < 0.001$). In terms of direct effects on teacher performance, Lestari (2025) found a regression coefficient of $B = 0.483$ ($t = 8.141, p < 0.05$) for the effect of visionary leadership on teacher performance in primary schools. Herdayati et colab. (2020) report a beta of 0.161 ($p < 0.05$) for teacher performance in pre-primary education.

The effects of autocratic leadership have been contradictory and require careful interpretation. A study conducted in Pakistan found that autocratic leadership "has a significant and strong positive impact on teacher performance" (Iqbal, 2019). Another study reported a strong positive correlation ($r = 0.617$) with "support for academic performance" (Nawaz & Khan, 2016). In contrast, research conducted in Iraqi universities concluded that autocratic leadership negatively affects job satisfaction (Al Obaidi & Abdul Rahman, 2018), while a Turkish study noted that it "may lead to reduced motivation" (Çelik, 2013). A subsequent investigation found a very weak, non-significant positive correlation ($r = 0.024$) between autocratic leadership and job satisfaction (Erdoğan, 2015).

Ethical service and leadership also demonstrate strong positive effects, particularly on teachers' organizational trust, justice, and organizational citizenship behavior. Their impact is often mediated by a climate of fairness and support. Bastea et al.'s study (2024), which analyzes the critical role of authentic leadership in rural schools in Romania, shows that the ethical dimension has a major impact on the effectiveness of pedagogical practices, having the lowest variability ($SD=0.72$) and the highest mean (2.96), followed by transparency, which has moderate variability ($SD=0.83$) and a lower mean (2.84).

Laissez-faire leadership is generally detrimental, negatively correlating with teacher commitment and intention to remain. However, it can have positive

effects on performance, motivation, and job satisfaction only under certain conditions: highly qualified and self-motivated teachers, certain cultural or institutional contexts (e.g., East Africa), and when used as a deliberate empowerment strategy rather than as an avoidance behavior. Evidence consistently indicates that this style is the least effective for educational performance. Many studies report negative beta coefficients (e.g., between -0.20 and -0.50) in relation to school performance, and its designation as having “least impact” highlights its disadvantages in a structured environment such as a school.

Militaru et al.'s (2016) research concludes that transformational leadership influences student performance through mediating variables (involvement, intrinsic motivation, self-efficacy), while transactional leadership shows a positive correlation, but weaker than transformational leadership, and laissez-faire leadership has a negative correlation.

The frequent presence of mediating variables (self-efficacy, confidence, satisfaction) supports theoretical models such as self-determination theory and social exchange theory. Leaders who promote autonomy, positive relationships, and professional growth contribute to the satisfaction of teachers' basic psychological needs, which translates into positive outcomes. These mechanisms are similar to those identified in the literature on leadership in private organizations, but present specificities related to school culture. The most common mediating variables were:

Teacher self-efficacy – mediates the relationship between instructional leadership and organizational commitment (significant indirect effect in 12 studies).

Trust in the leader – mediates the effect of transformational leadership on organizational citizenship behavior.

Job satisfaction – mediates the relationship between ethical leadership and intention to leave the profession.

The main moderating variables identified were: teacher gender (stronger effects for women in some studies), length of service in the profession, and cultural context (differences between collectivist and individualist countries).

4.5 Measurement Tools, Analysis Methods and Methodological Gaps in Quantitative Studies on Teachers' Leadership Styles

The main objective of the corpus of studies analyzed was the development and validation of measurement instruments in educational leadership. The methodology includes both exploratory analyses (EFA) and confirmatory analyses (CFA). In 41% of the studies, the authors used validated instruments, such as:

- 1) Multifactorial Leadership Questionnaire (MLQ), the most widely used instrument; it measures transformational, transactional and laissez-faire leadership
- 2) Principals Instructional Management Rating Scale* (PIMRS) – for instructional leadership.

- 3) Distributed Leadership Inventory* (DLI) – for distributed leadership.
- 4) TSES (Teacher Sense of Efficacy Scale), developed by Tschannen-Moran and Woolfolk Hoy (2001) to measure the confidence that teachers have in their own ability to influence the instructional-educational process.
- 5) Educational Leadership Scale for Academic Staff (ELSF) which has 22 items and excellent internal consistency ($\alpha = 0.89$).
- 6) Servant Leadership Scale (Liden et al., 2008), comprising 28 items that include seven major dimensions: conceptualization, emotional healing, prioritizing subordinates, helping subordinates grow and succeed, ethical behavior, empowerment, and creating value for the community.
- 7) Servant Leadership Scale in Higher Education in Spain (Latif & Marimon, 2019), specifically created to assess servant leadership in universities and includes seven dimensions: ethical behavior, development, emotional healing, empowerment, pioneering, relationship building, and wisdom.

These studies use the following quantitative analysis methods:

- structural analyses (CFA, EFA) for factor validation.
- structural equation modeling (SEM) to test direct and indirect relationships between leadership styles and variables such as teacher trust, school performance, or academic optimism.

The high heterogeneity across studies, reflected in the variation in effect sizes, suggests that leadership effects are strongly influenced by context. Most studies are cross-sectional and use convenience samples, which limits causal inferences. Furthermore, less than half of the studies adjusted for cluster (school) effects, although the data are hierarchical. This deficiency can lead to underestimated standard errors and the risk of false positive conclusions.

The main methodological deficiencies observed in the analyzed corpus of studies are related to the following aspects:

Overreliance on self-reported questionnaires, which may be biased and may not capture all the complexity.

Common method bias: Using the same source for the predictor and criterion (e.g., teachers reporting both leadership and self-efficacy) can artificially inflate relationships.

Causality and endogeneity issues in cross-sectional studies.

Construct redundancy: many scales actually measure the same underlying dimension, leading to artificial conclusions.

Lack of longitudinal studies that capture changes over time and the development of leadership.

Cross-cultural research is rare, and measurement instruments are often adapted without rigorous cross-cultural validation.

5. Conclusions

This PRISMA systematic review synthesized 87 quantitative studies from the Web of Science on teacher leadership styles, providing a comprehensive mapping of the field. Thus, we can observe a high degree of diversification of leadership styles. The results show that the most studied leadership models in quantitative educational research are related to transformational teacher leadership (60% of quantitative studies). We note that Distributed Leadership has gained ground in the last decade, reflecting a shift from a hierarchical to a collaborative vision. However, research in the last 5 years is moving away from an exclusive focus on transformational leadership and exploring combinations of styles. Thus, we observe a focus on leadership styles such as ethical, authentic or visionary that are associated with organizational integrity and a reduced intention to leave the profession. The most effective styles identified are Transformational, Distributed and Instructional Leadership. These directly and indirectly increase teacher job satisfaction, commitment, self-efficacy, and performance. The results are consistent with previous meta-analyses that have shown positive and significant effects of transformational leadership on organizational variables (Ahmed, 2025). Participatory/democratic and visionary leadership are also beneficial, but less studied. Transactional leadership is useful as an additional style. Autocratic and laissez-faire leadership should generally be avoided.

The diversification of styles investigated (ethical, authentic, visionary) reflects a maturation of the field, overcoming classic dichotomies. Of note is the increased interest in distributed leadership, consistent with contemporary paradigms that emphasize the importance of collaboration and distributed agency in schools. Also, in the current context of staff shortages and professional burnout, styles focused on teacher needs, such as servant leadership, can be particularly effective (Bellibaş and Kaya, 2025).

However, the conclusions of researchers in the field argue that adopting an integrated leadership model (e.g., instructional and distributed) is associated with the best results (Bellibaş et al., 2024). For educational performance, educational leaders must demonstrate flexibility in adopting a leadership style depending on the students they interact with (Crețu, 2015b).

A systematic review of recent quantitative research (2000-2026) identified three major gaps:

- The gender dimension in educational leadership

- Leadership in crisis contexts (beyond the pandemic)

- The negative effects of certain leadership styles (except for stress in the blue cluster).

To fill this gap, future quantitative research should address topics such as: the development of leadership models specific to crisis contexts, instruments for measuring the negative effects of leadership in education, intersectional approaches such as integrating gender with other categories (race, class, disability) in the analysis of educational leadership, the analysis of systemic barriers, and the shift

from psychologizing approaches (centered on individual traits) to structural-institutional ones.

Based on the analysis conducted, we can see the need for longitudinal studies that track effects over time and allow testing of the direction of causality, as well as cross-cultural validation of instruments that measure leadership styles in non-Western contexts.

Future research will likely investigate the mechanisms by which the distribution of responsibilities influences well-being and retention.

From a theoretical perspective, this analysis reinforces the idea that leadership effectiveness does not depend on a single style, but on the contextual combination of multiple practices. The integrated leadership profiles identified in latent class analysis offer a promising avenue for a more nuanced understanding of how school leaders structure their behavior.

In essence, the results suggest that educational leadership development programs should include multiple competencies: vision promotion, individualized support, relationship management, and delegation of responsibilities. A genuine change in school culture begins with improving teachers' skills and knowledge, not with direct administrative measures on students (Baştea et al. 2024). Trainers should also pay attention to developing leaders' ability to interpret context and adapt style to teachers' needs. In this direction, strengthening the psychological foundations of leadership becomes essential for building sustainable, value-oriented school cultures capable of responding to the complex demands of contemporary education (Minoiu et al., 2025). Therefore, understanding and developing effective and context-appropriate leadership styles is a priority for both research and educational policy.

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