

# The Knowledge Mapping and Evolutionary Patterns of Leadership Research in Education: A Bibliometric Study in Recent Thirty Years

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## Abstract:

**Purpose:** The purpose of this paper is to clarify the current knowledge structure of research on leadership in education (LIE) and to predict future research trends.

**Design/Methodology/Approach:** This paper presents a bibliometric analysis of 1,284 SSCI documents on LIE published in recent thirty years. Firstly, the descriptive analysis reviewed overall the situation of the research on LIE in terms of the number of publications, regional and journal distribution, major scholars, and research hotspots. Secondly, the author and literature co-citation networks were employed to examine the subfields, the keyword co-occurrence network was employed to investigate the research hotspots, and the strategic coordinate chart was used to portray the current status and future trends of LIE.

**Findings:** Firstly, the relationship between leadership and school improvement or teacher development has received widespread attention from scholars, manifested in the improvement of publication volume and research topics. Secondly, research on LIE has shifted its focus from a vertical hierarchy to a horizontal distribution of leadership styles, the essence of leadership has become broader. Thirdly, research topics on LIE have become segmented and diversified, emphasizing the pivotal role of leadership in student development, teachers satisfaction, and school reform within the rapidly changing context.

**Originality/Value:** This paper utilizes quantitative methods to provide an overall review of research on leadership in education over the past three decades, which helps to clarify ambiguous concepts and to examine the current state of research and future trends from a clearer perspective.

**Keywords:** Leadership in education, bibliometrics, knowledge map, research outlook

## 1. INTRODUCTION

Effective leadership is fundamental to high-quality education. There is a growing consensus that educational leadership stands as the second most crucial element influencing learning outcomes (UNESCO, 2023). Recognizing the important role of leadership, there has been a surge of interest in the research of educational leadership. Scholars have conducted rich research on educational leadership from different perspectives. In the educational context, leadership is categorized into different levels, including leadership in kindergarten (Li, 2014), primary and secondary schools (Robinson et al., 2008; Leithwood, 1994), and higher education (HOUa et al., 2020). Regarding different leadership roles, it includes principals (Bolkan and Goodboy, 2009) and other teachers in administrative positions (Moreira et al., 2018), as well as general teacher leadership (Bolkan and Goodboy, 2009; Spillane et al., 2004). Moreover, when exploring the diverse forms of leadership, it spans instructional leadership (Marks and Printy, 2003), transformational leadership (Leithwood and Jantzi, 1990; Bolkan and Goodboy, 2009), distributed leadership (Heck and Hallinger, 2009; Gronn, 2002), and informational leadership (Moreira et al., 2018). There is a widespread consensus in the academic community that educational leadership can be effective without depending on executive authority, and any member within an organization has the potential to demonstrate leadership. Educational leaders have the capacity to influence both students and colleagues through their professionalism and can serve as a central communication link connecting teachers, principals, and parents. Educational leadership of this kind, rooted in professional expertise, breaks with the traditional model of hierarchical leadership and has a stronger foundation and more far-reaching impact (York-Barr and Duke, 2004).

There has been an abundance of research demonstrating the positive impacts of leadership in education. Firstly, it affects students by improving their achievements through the creation of a positive learning environment and the facilitation of professional development for teachers (Witziers et al., 2003; Robinson et al., 2008; Hallinger et al., 1996). Research also emphasizes that leadership's impact on student learning ranks second only to classroom instruction (Wenner and Campbell, 2017). Secondly, regarding the impact on teachers, scholars believe that leaders can contribute to teacher professional development by nurturing their growth, fostering effective communication, and approaching teaching and research from a leadership perspective (Tschannen-Moran and Gareis, 2015). Thirdly, concerning its effects on schools, several studies have indicated that transformational leadership plays a pivotal role in school reform by creating a vision, offering tailored support, and fostering effective teaching and learning (Liebowitz and Porter, 2019; Liu et al., 2020; Hallinger and Heck, 2010; Khalifa et al., 2016). Moreover, it can help to leverage the influence of principals or teachers to promote educational equity as well as home-school collaboration (Hallinger, 2018).

The existing research reveals a wealth of studies that explore the concepts, categorizations, and functions of leadership in education. However, there exist diverse perspectives on educational leadership, making it challenging to organize them using traditional qualitative methods. Recently, some scholars have conducted integrated review studies on educational leadership (Wang, 2018; DeMatthews and Mawhinney, 2014). However, most of these studies concentrated on specific topics such as instructional leadership of principals (Hallinger et al., 2020), the relationship between school principals' leadership behaviours and teachers' job satisfaction (Cansoy, 2018), the development of educational leadership and management research in Turkey (Gümüş et al., 2020, p. 1) etc. ,making it insufficient to provide a comprehensive overview of the current situation and future evolutionary trends in educational leadership research. Failing to review and synthesize existing research results and accurately discern the future direction will not only impede substantial advancements in theoretical research but also hinder the progress of educational practice in aspects like school reform, teachers' professional development, or students' performance improvement. Therefore, using the R-based bibliometric software Bibliometrix, this article employs techniques like word frequency analysis, citation network analysis, and knowledge map visualization, combined with the intensive reading and a thorough literature review, to analyze and interpret educational leadership research from the past 30 years with a more diverse and dynamic approach. The review addresses the following research questions:

RQ1: What are the overall volume by time, geographic and journal distribution and leading scholars of LIE research in the past 3 decades?

RQ2: What are the main schools and branches of the LIE research?

RQ3: What are the hot spots, current status and future trends of LIE research?

In this review, the authors employed bibliometric methods to analyze 1284 SSCI-indexed journal articles related to the leadership in education. Firstly, we examine the subfields within educational leadership research through author co-citation and literature co-citation network mapping. Secondly, it investigates the research hot spots in educational leadership by employing keyword co-occurrence network mapping. Thirdly, the paper portrays the current status and future trends in research within various aspects of educational leadership using the strategic coordinate chart. In doing so, the paper aims to serve as a reference for advancing theoretical research and practical applications in educational leadership.

## **2. LITERATURE REVIEW**

There is some review research on leadership in education, which can be broadly divided into two types: those that address the entire field and those that focus on specific topics.

When addressing different types of leadership, Gumus et al. reviewed leadership models in educational research and identified that distributed leadership, instructional leadership, teacher leadership, and transformational leadership are the most studied leadership models in educational research (Gumus et al., 2018). Day et al. explored the role of leadership in schools, using examples of transformational, pedagogical, and distributed leadership. The study concluded that leadership has a

direct impact on school organization, culture, and teachers, thereby indirectly influencing students' outcomes (Day et al., 2020). Daniëls et al. clarified the distinctions and connections between leadership types, such as instructional leadership, situational leadership, transformational leadership, and distributed leadership, by comparing core constructs in various leadership studies. They further summarized the characteristics of effective school principals (Daniëls et al., 2019). Hallinger focused on the relationship between school administration and leadership, asserting that the paradigm of school administration research is shifting toward leadership research (Hallinger and Kovačević, 2019). Building on this foundation, Hallinger et al. employed longitudinal bibliometric analysis to delineate the evolution of research related to educational leadership and management (EDLM). They found that EDLM-related research has undergone four scholarly generations: Leadership for Learning, Leading Change, Leading Teachers, as well as School Effectiveness and School Improvement (Hallinger and Kovačević, 2021).

In contrast to the broad focus on educational leadership research, certain scholars have opted for more targeted review topics. Cansoy conducted a review focusing on the correlation between school principals' leadership behaviors and teachers' job satisfaction. The findings indicated that administrative behaviors fostering participation, flexibility, individual orientation, shared leadership, and supportive leadership enhanced teachers' job satisfaction (Cansoy, 2019). Hallinger et al. conducted a review of research on the instructional leadership of principals within the framework of principal accountability. They identified three key themes: leadership effects on teachers and students, contexts for leadership practice, and methods for developing instructional leaders (Hallinger et al., 2020). Additionally, there are more specialized topics, including a review of educational leadership and management research in Turkey (Gümüş et al., 2020), and an examination of articles published in the journal *Educational Management Administration & Leadership* from 1972 to 2020 (Hallinger and Kovačević, 2022).

This review builds upon prior literature, extending the research scope to offer a comprehensive perspective on the knowledge structure and future directions of leadership research in education. Unlike prior reviews concentrating on specific subjects, this review delves into leadership research across the entire educational domain, enabling a comprehensive view of leadership research development in education. Additionally, compared to the prior reviews, our research is broader in the scope, evident in our keyword selection. Employing keywords with a wider range of meanings ensured the inclusion of a maximum number of relevant studies. Previous reviews often limited focus to leadership in primary education, neglecting higher education, whereas our review encompasses all educational stages. Furthermore, this review's scope of leadership roles extends beyond principals to encompass various roles like teachers. Thus, this review endeavors to comprehend the existing knowledge framework of Leadership in Education (LIE) research and forecast its prospective trends.

### **3. METHOD**

#### **3.1. Data Collection**

To ensure the validity and credibility of the measurement results, the following steps were used in this study to construct the core dataset. Firstly, based on the Web of Science database, we selected SSCI-indexed journals, set the search interval as 1991-2021, and searched the titles, abstracts and keywords of the literature with the search terms of "teacher leadership", "educational leadership", "instructional leadership" and "school leadership", obtained initial search results of 1,781 articles. Secondly, the document types were limited to "article", "review" and "book chapter", which again resulted in 1,452 articles. Furthermore, we restricted the research fields to "education", "management" and "psychology" and obtained 1,333 screening results. In order to more accurately ensure the relevance of the literature to this study, we also manually screened the search results based on information such as titles, abstracts, citations, etc. The specific screening method was as follows: Firstly, we excluded the literature with keywords that did not include the terms "teacher leadership", "educational leadership", "instructional leadership", and "school leadership"; Secondly, the abstracts of the literature containing the established keywords were read to eliminate literature whose topics were not related to education or which only mentioned the word leadership but did not center on leadership. The final result was a total of 1,284 research papers related to leadership in education.

### 3.2. Research Method

This study focuses on the descriptive analysis and literature network mapping of the core dataset literature using the Bibliometrix tool in R language. The descriptive analysis mainly includes year-by-year analysis of the number of publications, analysis of regional distribution, distribution of journals, major scholars, hot keywords, and analysis of highly cited papers. Literature network mapping analysis mainly includes author co-citation network analysis, literature co-citation network analysis, keyword co-occurrence network analysis and strategic coordinate mapping analysis. The author co-citation network reveals the research genres, literature co-citation network reveals the research branch, keyword co-occurrence network reveals research hot spots, and strategic coordinate mapping reveals the current status of research and evolutionary trends of each direction. And finally, we discussed the future research direction of educational leadership by combining the results of the above studies. Co-citation together with keyword co-occurrence analysis are widely used in the intellectual structure and paradigm evolution analysis of selected knowledge fields. The document co-citation was defined by Small as frequency with which two documents are cited together, and the same is true for author co-citation (Small, 1973). Co-citation analysis has its potential to observe relevant articles in broader databases rather than the reviewer's database, which is more rigorous than the direct citation analysis (Eck & Waltman, 2014). Similarly, co-citation networks are most suited to analysis the evolution of a certain system (Radhakrishnan et al., 2020).

## 4. RESULTS OF DESCRIPTIVE ANALYSIS

### 4.1. Publication Data

Statistical analysis of the literature on leadership research in education shows that the annual publication volume of related studies stabilized at less than 20 articles in 2004 and before, and then showed a significant increase after 2004, with an annual growth rate of 78.57%. Between 2019 and 2021, the annual publication volume exceeded 90 articles; by 2022, the relevant literature reached 1190 articles. In general, the study of leadership in education has received increasing attention from scholars since 2007.

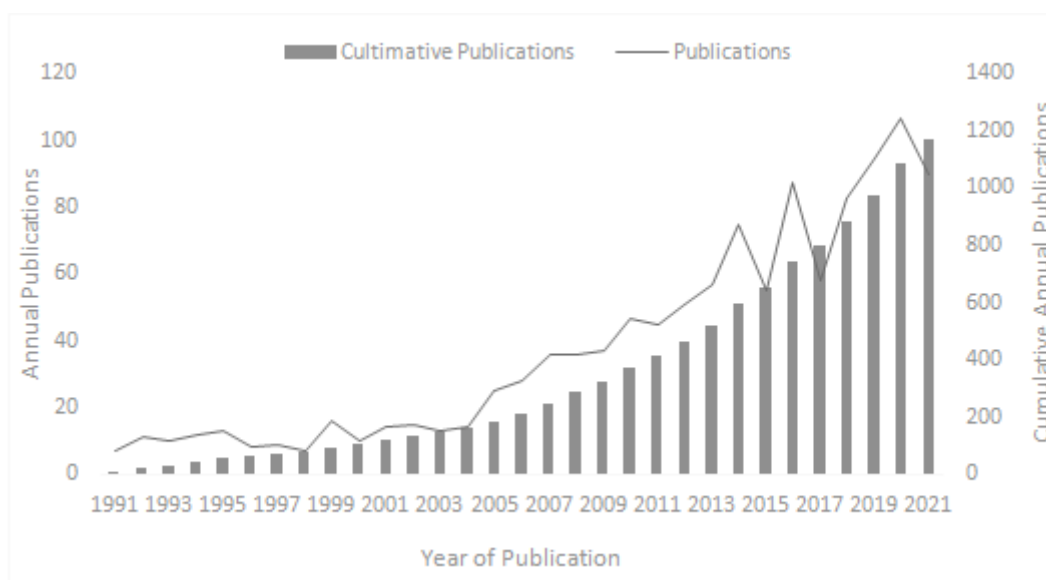


Figure1. Publication data in leadership research in education

### 4.2. Country Distribution

Regarding the countries of leadership research in education, the United States has the highest concentration of related research, with 745 articles, accounting for 58.02% of the total. The United Kingdom and China followed with 211 and 159 articles, respectively. It can be seen that the United States is still in a dominant position in leadership research in education. However, relevant research is emerging in Asia, Europe, Australia, South Africa and other places, and the influence is on the rise.

**Table1.** Top 10 countries ranked by number of publications (1991-2021)

	<b>Countries</b>	<b>Articles</b>	<b>Percentage</b>
1	USA	745	58.02%
2	UK	211	16.43%
3	China	159	12.38%
4	Turkey	118	9.19%
5	Australia	104	8.10%
6	South Africa	102	7.94%
7	Netherlands	76	5.92%
8	Canada	72	5.61%
9	Israeli	63	4.91%
10	Spain	55	4.28%

### 4.3. Journal Distribution

Table 2 shows the ranking of the top ten journals for leadership research in education, with a total of 565 publications, accounting for 44.00% of the total percentage of publications. The two journals with the most publications, Educational Management Administration & Leadership and Educational Administration Quarterly, accounting for 14.49% and 11.29%.

**Table2.** Top 10 journals ranked by number of publications (1991-2021)

	<b>Journals</b>	<b>Articles</b>	<b>Percentage</b>		<b>Journals</b>	<b>Articles</b>	<b>Percentage</b>
1	<i>Educational Management Administration &amp; Leadership</i>	186	14.49%	6	<i>Asia Pacific Education Review</i>	26	2.02%
2	<i>Educational Administration Quarterly</i>	145	11.29%	7	<i>Education and Urban Society</i>	24	1.87%
3	<i>School Effectiveness and School Improvement</i>	38	2.96%	8	<i>Teaching and Teacher Education</i>	22	1.71%
4	<i>South African Journal of Education</i>	36	2.80%	9	<i>Teachers College Record</i>	19	1.48%
5	<i>Journal of Educational Administration</i>	34	2.65%	10	<i>Educational Studies</i>	18	1.40%

### 4.4. Leading Scholars

The leading scholars can be broadly divided into two categories. The first category is the relationship between leadership and student performance and development, representing scholars such as Hallinger P, Leithwood K, Murphy J, research interests include instructional leadership, principal leadership, leadership impact on student learning. The second category is the relationship between leadership and teacher performance and development, representing scholars such as Devos G, Bellibas Ms, with research interests including teacher instructional practices, teacher organizational commitment.

**Table3.** Top 5 Scholars ranked by number of publications

	<b>Scholars</b>	<b>Articles</b>
1	Hallinger P	41
2	Devos G	17
3	Bellibas Ms	12
4	Leithwood K	11
5	Murphy J	9

### 4.5. Popular Keywords

The most popular keywords for leadership research in education are shown in Table 4. The top 5 keywords are mainly focused on concepts related to teacher professional development and school improvement, and their frequency of occurrence is significantly higher compared to other keywords.

**Table 4.** Popular Keywords for Leadership Research in Education

	<b>Keywords</b>	<b>Frequency</b>
1	distributed leadership	74
2	transformational leadership	56
3	professional development	39
4	school improvement	37
5	management	33
6	principal leadership	23
7	administration	19
8	social justice	19
9	leadership development	17
10	school principals	15

#### **4.6. Highly Cited Papers**

The highly cited papers reflect the most representative, influential, and consistently emphasized research topics in the field. By analyzing the top 10 most representative papers, we can broadly identify the hot topics of leadership research in education.

Transformational leadership and instructional leadership were the relatively distinctive themes. In 1994, Leithwood conducted pioneering research on transformational leadership in education. This study, with 260 citations, prompted a shift in educational leadership research, moving it away from the traditional emphasis on instructional leadership to a focus on the role of transformational leadership (Spillane et al., 2004). Marks continued this line of research and emphasized the significance of integrating both transformational and instructional leadership. It also has inspired subsequent research on paradigm shifts in educational administration. (Marks and Printy, 2003). Building on this research, Leithwood conducted a more nuanced exploration in 2007, delving into the effects of transformational leadership on teachers, their classroom practices, and student achievement. Similarly, Thoonen investigated the mechanisms through which transformational leadership enhances teachers' instructional practices. This study has since become a crucial reference for research on mechanisms influencing outcome variables like teacher motivation, self-efficacy, and instructional quality (Thoonen et al., 2011). These four highly cited studies collectively illustrate the enduring nature of research on transformational leadership and its promising research prospects in the future.

The highly cited literature further reflects the shift from a focus on principal leadership to teacher leadership. Witzier conducted a quantitative meta-analysis to examine the influence of principal leadership on student achievement. This study also delved into the reasons behind the conflicting results (Witziers et al., 2003). Notably, this research marked the inception of quantitative methods being employed for educational leadership reviews. The review by York-Barr and Duke regarding the conceptualization of teacher leadership stands as a seminal contribution to this area. It arrived at a significant conclusion that "the conceptualization of teacher leadership has evolved from formal role-based leadership to informal leadership", garnering 491 citations (York-Barr and Duke, 2004). Building on the studies mentioned above, Wenner & Campbell and Nguyen revisited the examination of empirical studies concerning teacher leadership based on the changes in the policy context and educational landscape (Wenner and Campbell, 2017; Nguyen et al., 2019). Overall, scholars made efforts to clarify the conceptualization and role of leadership in education. It was during this era that the evolution of educational leadership started moving towards a more widely distributed leadership model.

Wahlstrom's research, which investigate the influence of shared leadership on teachers instructional practices, serves as a cornerstone for understanding leadership's effects on student outcomes (Wahlstrom and Louis, 2008). Heck's study underscored that distributed leadership directly bolstered academic competencies in schools and indirectly enhanced student performance in mathematics (Heck and Hallinger, 2009). Subsequently, Leithwood (2010) proposed a four-path model to elucidate leadership's influence on student learning. The aforementioned highly-cited works further emphasize the important role of distributed leadership (Leithwood et al., 2010).

Drawing on social equity leadership theory, Theoharis examined how 18 U.S. elementary and secondary school principals overcame race, gender, class, disability, sexual orientation, and other historically marginalized discriminatory factors to promote educational equity. It's the only one

among the top 10 most cited works addressing leadership in the context of educational equity, but it holds the third position in terms of citations. This implies that the subject of educational equity, particularly concerning gender and race, has garnered significant attention, leading to a body of research exploring educational leadership in the context of cultural and social equity themes (Theoharis, 2007; Khalifa et al., 2016; Hallinger, 2018; Wang, 2018).

**Table 5.** *Highly Cited Papers in Leadership Research in Education*

<b>Scholars and year of publication</b>	<b>Articles</b>	<b>Journals</b>	<b>Research Theme</b>	<b>Citations</b>
Marks,2003	Principal Leadership and School Performance: An Integration of Transformational and Instructional Leadership	<i>Educational Administration Quarterly</i>	The Importance of Combining Instructional Leadership and Transformational Leadership	530
York-barr,2004	What Do We Know About Teacher Leadership? Findings From Two Decades of scholarship	<i>Review of Educational Research</i>	Teacher Leadership	491
Theoharis,2007	Social Justice Educational Leaders and Resistance: Toward a Theory of Social Justice Leadership	<i>Educational Administration Quarterly</i>	Social Justice Leadership	412
Witzier,2003	Educational Leadership and Student Achievement: The Elusive Search for an Association	<i>Educational Administration Quarterly</i>	The Impact of Principal Leadership on Student Achievement	293
Leithwood,1994	Leadership for School Restructuring	<i>Educational Administration Quarterly</i>	The Importance of Combining Instructional Leadership and Transformational Leadership	260
Leithwood,2010	Testing a Conception of How School Leadership Influences Student Learning	<i>Educational Administration Quarterly</i>	Four Pathways of Action for Leadership to Impact Student Achievement	260
Leithwood,2007	Transformational School Leadership for Large-Scale Reform: Effects on students, teachers, and their classroom practices	<i>School Effectiveness and School Improvement</i>	The Impact of Transformational Leadership on Teachers and Their Classroom Practices and Student Achievement	256
Wahlstrom,2008	How Teachers Experience Principal Leadership: The Roles of Professional Community, Trust, Efficacy, and Shared Responsibility	<i>Educational Administration Quarterly</i>	How Principal Leadership Impacts Teacher Instructional Practices	250
Heck,2009	Assessing the Contribution of Distributed Leadership to School Improvement and Growth in Math Achievement	<i>American Educational Research Journal</i>	The Impact of Distributed Leadership on School Academic Proficiency and Student Achievement in Math	247
Thoonen,2011	How to Improve Teaching Practices: The Role of Teacher Motivation, Organizational Factors, and Leadership Practices	<i>Educational Administration Quarterly</i>	How to improve teaching practice	230

## 5. RESULTS OF LITERATURE NETWORK ANALYSIS

This section analyzes the factions, branches and hotspots of leadership research in education. We employ network mapping analysis based on the authors, references, and keywords, aiming to present a holistic view of the current state of research and outline future research trends.

### 5.1. Research Faction

Figure 2 shows the author co-citation network in the field of educational leadership research. The analysis reveals three primary clusters. In Cluster 1 (red), prominent scholars like Leithwood, Spillane, Murphy, and Fullan focus on the impact of leadership on student achievement, behavior, and overall school change. These studies represent the early explorations of leadership; however, their conclusions often present contradictions. Cluster 2 (blue), led by Hallinger, Marks, and Robinson, delves deeper into leadership, distinguishing between instructional leadership and transformational leadership. Their work clarifies the intricate relationship between leadership and student behavior as well as school development. Cluster 3 (green) comprises scholars such as Bush, Day, and Walker, who concentrate on identifying the traits of effective principal or teacher leadership in contexts of change or challenging environments.

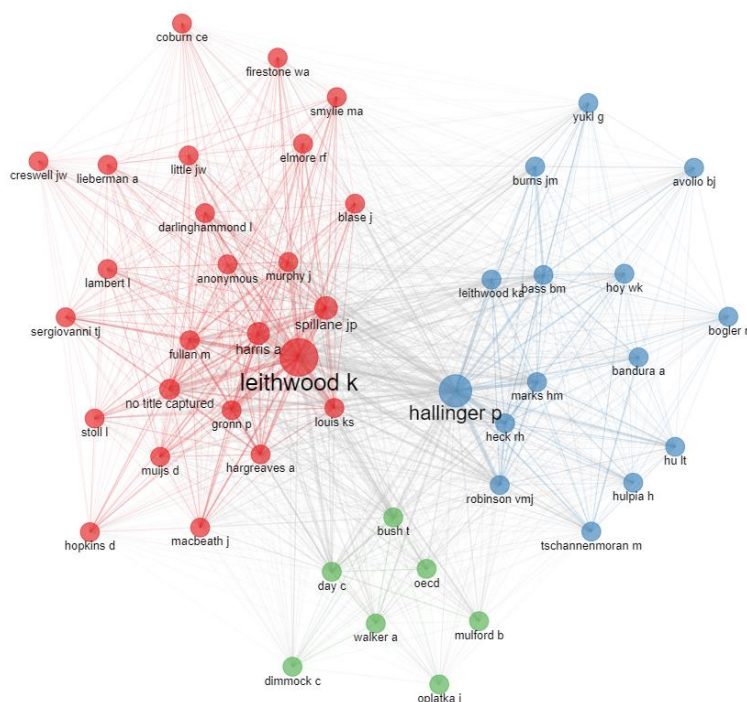


Figure 2. Mapping of co-cited networks of authors of leadership research in education

### 5.2. Knowledge Cluster

Figure 3 depicts a literature co-citation network of leadership research in education, and Table 6 provides information about key literature nodes. Based on the chart, the existing research can be grouped into three primary knowledge clusters. Knowledge Cluster 1 (in green) delves into the connection between teacher and principal leadership and student achievement. Knowledge Cluster 2 (in blue) concentrates on the structure of teacher leadership within the framework of distributed leadership. Knowledge Cluster 3 (in red) is dedicated to investigating leadership styles that foster the establishment and growth of educational institutions.

#### 5.2.1. The Relationship between Teacher (Principal) Leadership and Student Achievement

Knowledge Cluster 1 (green) examines the correlation between teacher and principal leadership and its influence on student achievement. Transformational and instructional leadership are two of the most dominant types of leadership. Marks and Printy (2003) explored the complementary role of transformational and instructional leadership to impact the quality of instruction and student achievement (Marks and Printy, 2003). Building on previous research, Witzier (2003) provided an



overview of "the existence of principal leadership and the pathways of its impact on student achievement" and found this theme contain many conflicting conclusions (Witziers et al., 2003). Subsequently, Robinson (2008) delved into the reasons behind these contradictory findings. However, unlike Witzier, Robinson did not tackle teacher leadership as a whole but instead adopted a more nuanced approach, scrutinizing transformational and instructional leadership respectively, along with a more detailed set of five leadership dimensions. One of the dimensions, namely "facilitation of, and participation in, teacher learning and development", were found to have the strongest positive impact on student achievement (Robinson et al., 2008).

### *5.2.2. The Components of Teacher Leadership from a Distributed Leadership Perspective*

Knowledge Cluster 2 (blue) focuses on the concept of teacher leadership from a distributed perspective. This cluster asserts that relying solely on the leadership of a single principal is inadequate for addressing the day-to-day challenges in school operations. Instead, it advocates for empowering teachers and involving them in school governance. Spillane (2001) examines how school leadership identifies and activates human, social, and material resources to promote the teaching and learning of "science" subjects that are neglected in many schools. He contends that adopting a distributed leadership perspective is essential for assessing the resources required for pedagogical change. He also advocates that individuals should leverage their strengths in the classroom and during curriculum revisions, aiming to harness the knowledge and skills of all organization members and maximize human capital (Spillane et al., 2001). Drawing from Activity Theory and Theories of Distributed Cognition, Spillane (2004) further posited that leadership practices are embedded within the context of school leaders, followers, and specific situations. That is, leadership is a dynamic process of organizing the leader's participation with others around a specific task in a specific context (Spillane et al., 2004).

Subsequently, York-Barr and Duke (2004) have conducted a comprehensive review of teacher leadership research spanning the past two decades. Their study encompasses its definition, role, influencing factors, developmental approaches, and outcomes. The review highlights a noteworthy shift in the concept of teacher leadership, transitioning from formal to informal leadership. In this context, "informal" refers to teachers who, while not holding traditional school administrative positions, but undertaking leadership-related responsibilities in their day-to-day work, such as school curriculum and instructional reforms, collaborating with and influencing colleagues, and building connections within the community. This form of leadership departs from the traditional top-down pyramid structure and adopts a more horizontal, organization-wide distribution, often termed "distributed leadership" (York-Barr and Duke, 2004).

### *5.2.3. Types of Leadership for School Building and Development*

Knowledge Cluster 3 (red) focuses on the leadership types that contribute to school growth and development. Leithwood's exploration emphasizes the significance of transformational leadership in school reform. He argues that instructional leaders often neglect essential factors required for school improvements, such as fostering a shared vision, cultivating a high-performance work culture, and empowering others. Transformational leaders, on the other hand, bridge this gap. His research confirmed that transformational leadership impacts teacher motivation for change, teachers' perceptions of student performance, as well as student engagement and achievement through teachers' cultural perceptions, commitment to change, and organizational learning (Leithwood, 1994).

Moreover, Leithwood's 2008 research reveals seven key findings on effective school leadership. Firstly, school leadership, second only to classroom teaching, significantly influences student achievement and acts as a catalyst for organizational potential. Secondly, effective leaders utilize similar skills from practices like goal-setting, staff development, restructuring, and teaching management. Thirdly, leaders actively respond to their work environment, addressing crises during organizational change by clarifying priorities and decentralizing power. Fourthly, school leaders improve teaching and learning by motivating staff and enhancing working conditions. Fifthly, distributed leadership maximizes its impact on schools and students. Sixthly, collective distribution proves more effective than collaboration. Seventhly, a small set of leadership traits explains effectiveness, such as flexible thinking, willingness to learn, perseverance, and resilience. The

research notes that existing contradictions and debates result from the lack of programmatic studies, insufficient empirical evidence, methodological inconsistencies, and limited policy and practice recommendations (Leithwood et al., 2008).

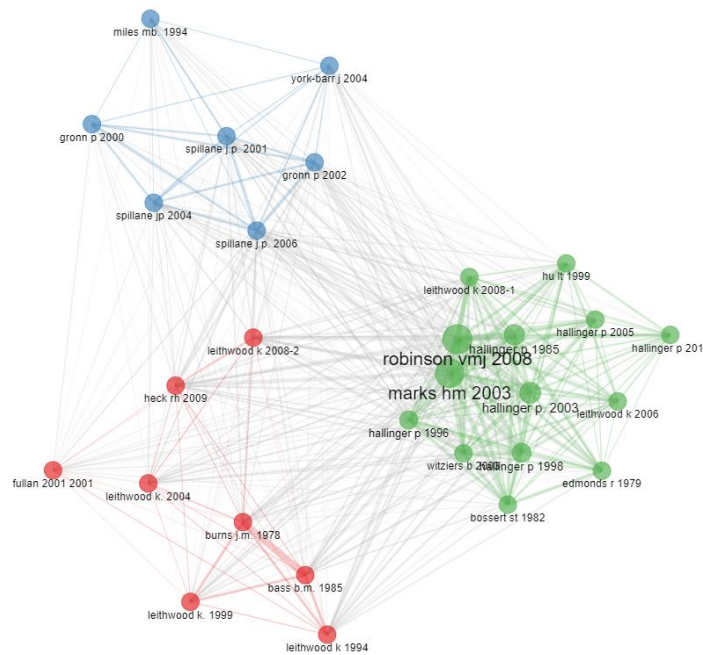


Figure3. Co-citation network mapping of research literature on leadership in education

With the evolution of leadership theories, scholars have shifted their focus away from traditional administrative leadership to embrace distributed leadership theories that emphasize empowering teachers. Heck and Hallinger (2009) stated that distributed leadership has a significant direct effect on school academic proficiency growth and an indirect effect on student achievement growth in math. Additionally, their groundbreaking finding that the relationship between school leadership and the growth of academic capacity in schools is dynamic and reciprocal has significant theoretical value. This challenges the conventional scholarly perception of school leadership as a one-way driver of school change and performance enhancement (Hallinger and Heck, 2010).

Table6. Significant node literature information in the literature co-citation network mapping

Cluster	Scholars and year of publication	Articles	Journals
1 Relationship between teacher (principal) leadership and student achievement	Robinson,2008	The Impact of Leadership on Student Outcomes: An Analysis of the Differential Effects of Leadership Types	<i>Educational Administration Quarterly</i>
	Marks,2003	Principal Leadership and School Performance: An Integration of Transformational and Instructional Leadership	<i>Educational Administration Quarterly</i>
2 Components of Teacher Leadership from a Distributed Leadership Perspective	Spillane,2001	Urban School Leadership for Elementary Science Instruction: Identifying and Activating Resources in an Undervalued School Subject	<i>Journal of Research in Science Teaching</i>
	York-barr,2004	What Do We Know About Teacher Leadership? Findings From Two Decades of Scholarship	<i>Review of Educational Research</i>
3 Types of leadership that contribute to school building and development	Leithwood,2008	Seven strong claims about successful school leadership	<i>School Leadership &amp; Management</i>
	Heck,2009	Assessing the Contribution of Distributed Leadership to School Improvement and Growth in Math Achievement	<i>American Educational Research Journal</i>

### **5.3. Core Issues and Research Hotspots**

Figure 4 presents a keyword co-occurrence network map. Accordingly, we can see that leadership research in education revolves around three central themes: traditional educational leadership research during the exploratory period, transformational leadership in the mid-developmental period, and distributed teacher leadership in the late developmental phase.

#### *5.3.1. Traditional Leadership Study in Education*

Cluster 1 (red) comprises essential keywords: "educational leadership", "principals", "management". This cluster represents the phase of exploring educational leadership. However, different studies define the connotation of "educational leadership" differently. Despite the variations, the purpose remains to explore the influence of educational leadership on student achievement.

In the 1980s, concerns about educational leadership centered on teacher leadership in the classroom and the impact of teachers as classroom leaders on student achievement. During this period, educational leadership was primarily understood as instructional leadership, separate from administrative leadership, although this distinction has gradually blurred with the demands of school development. For instance, the Principal Instructional Management Rating Scale (PIMRS) model developed by Hallinger in 1982 defined educational leadership through three dimensions: defining the school mission, managing the teaching and learning process, and fostering a positive learning climate. This definition indicates that principals perform both instructional and administrative management.

In the 1980s and 1990s, the school change movement emerged in the United States, shifting the focus of educational leadership from promoting teaching and learning to promoting school-wide change. For instance, Leithwood and Jantzi (1990) emphasized the importance of transformational leadership, introducing a new understanding of educational leadership during that specific period. This perspective highlighted principals as agents of change in their schools and advocated for educational leadership to address broader, longer-term issues related to cultural transformation within the educational system, rather than solely focusing on classroom instruction, coordination, and assessment. This viewpoint challenges the traditional concept of instructional leadership and suggests that transformational leadership effectively enhances educational outcomes.

In addition to instructional leadership and transformational leadership, which have received the most attention, the connotation of educational leadership includes more specific dimensions such as informational leadership and social equity leadership. However, these studies are fragmented, with the majority being case studies focused on specific schools.

Overall, this clustering focused more on the traditional leadership role of principal in the school. Early traditional leadership research primarily explored the role of principals in promoting instruction rather than administration. This emphasis stemmed from the fact that many principals were initially promoted to administrative positions due to their exceptional teaching skills. However, principals also play a vital role in facilitating school change and development through their administrative power and professional skills. Therefore, this aspect of their role has gradually gained significance in subsequent research.

#### *5.3.2. Shift from Traditional Educational Leadership to Transformational Leadership*

The core keywords of cluster 2 (blue) include "instructional leadership", "school leadership", and "transformational leadership", which shows that this cluster has a more specific definition of educational leadership.

Given that the primary and central goal of schools is to enhance student achievement, instructional leadership pertaining to classroom teaching has naturally garnered scholarly attention. However, early theories of instructional leadership had significant limitations. They solely assigned this responsibility to the principal, neglecting the contributions of other faculty members in goal-setting, program oversight, and the advancement of academic knowledge. Marks redefines instructional leadership as "shared instructional leadership," asserting that it isn't solely the principal's responsibility, but rather necessitates active collaboration between principals and teachers in domains like curriculum instruction and assessment. The notion that "principals are not just instructional leaders, but leaders of instructional leaders" laid the groundwork for subsequent views of teacher leadership as a form of distributed leadership (Marks and Printy, 2003).

With the emerging demand for change in schools, instructional leadership is gradually diminishing in significance, while the necessity for transformational leadership is on the rise. Hallinger proposes that transformational leaders aim to enhance organizational performance through a focus on problem identification, problem-solving, and collaborative efforts with stakeholders (Hallinger et al., 1996). Bolkan and Goodboy conducted a study on the impact of three transformational leadership dimensions—leadership charisma, personalized attention, and intellectual stimulation—on student achievement, engagement, and student-perceived faculty credibility in higher education. Their findings revealed significant correlations (Bolkan and Goodboy, 2009). Vermeulen (2014) investigated how transformational leadership influences teachers' adoption of digital instructional materials. The study revealed that teachers' receptiveness to digital materials was associated with various factors, with the "intellectual stimulation" aspect of transformational leadership having the most pronounced effect. This influence was mediated by teachers' professional development and emotional attitudes.

In addition, synthesizing and contrasting research on instructional leadership and transformational leadership studies were important themes in this clustering. Marks combines transformational and instructional leadership to examine the impact of integrated leadership on school performance. Through case studies, he found that teachers and pupils in schools with 'integrated leadership performed well. Indeed, one of the primary objectives of school change is to enhance student achievement, and in this regard, transformational leadership serves the same purpose as instructional leadership (Marks and Printy, 2003). Unlike Marks, Robinson explored the different impact of instructional leadership and transformational leadership on student achievement. Through meta-analysis, he found that instructional leadership had, on average, three to four times the impact on student achievement compared to transformational leadership (Robinson et al., 2008).

Taken together, instructional leadership emphasizes classroom matters associate with student achievement, while transformational leadership is more concerned with organizational development related to school change.

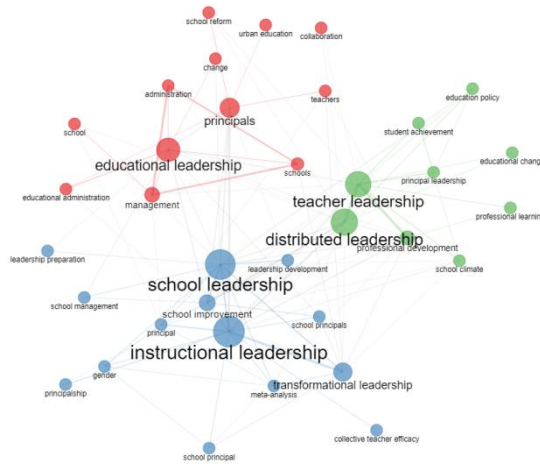
### *5.3.3. Shift from Pyramidal to Distributed Teacher Leadership*

The core keywords of cluster 3 (green) include "teacher leadership" and "distributed leadership", which mainly explore the connotation of teacher leadership, and the relationship of leadership distribution between principals and teachers. It advocates the implementation of distributed leadership to promote school development. As leadership in education has evolved, scholars have increasingly focused on the sharing, or distribution, of leadership among administrators, teachers, and parents (Gronn, 2002). This distribution is often facilitated through teachers. Hence, this cluster employs the term "Teacher Leadership" to underscore the teacher's role in distributing leadership.

The review of teacher leadership by York-Barr & Duke (2004) stands as a classic work in this field. It encompasses a review of research spanning the last two decades, offering insights into the present state of research, its significance, conceptual definitions, role implications, influencing factors, outcomes, and other critical aspects of teacher leadership. Teacher leaders have firsthand knowledge of classroom instruction and school culture, which are crucial for educational reform (York-Barr and Duke, 2004). They serve as both formal leaders, like administrators and union representatives, and informal leaders who influence colleagues, communities, students' parents, and principals in their daily roles, ultimately contributing to school reform and enhanced student achievement. Furthermore, Heck's study revealed that distributed leadership has a pronounced direct impact on the advancement of academic competencies in schools and an indirect impact on students' mathematics achievement. Additionally, it proposes that the connection between leadership, school change, and performance enhancement is a result of mutual interaction, not a one-way facilitation (Heck and Hallinger, 2009).

There exists a consensus in the academic community, acknowledging that teacher leadership is present in every member of the school organization, not limited to administrative leaders alone. Teacher leadership aligns closely with a form of distributed leadership, manifesting not only within the school but also beyond its boundaries. Within the school, teachers enhance student achievement through proficient classroom management, promote professional development by influencing colleagues, and drive school reform by engaging with principals and participating in decision-making. Outside the school, teachers foster the connection between the school and home education, and promote educational equity through community involvement and parental guidance.

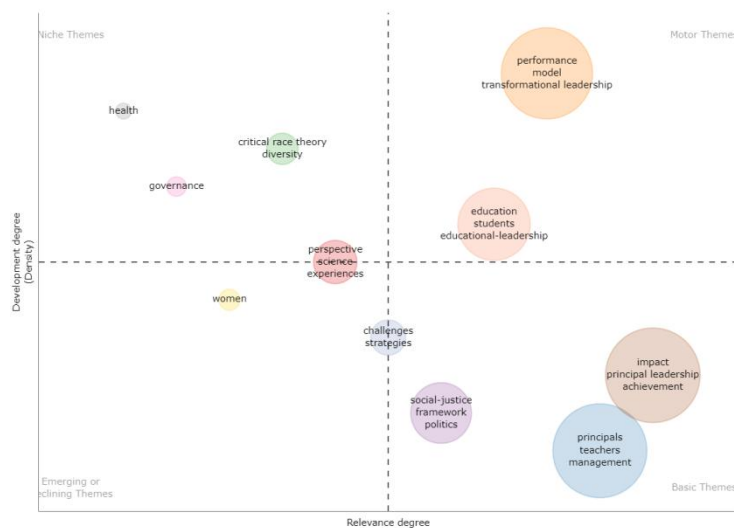
At the same time, the development of teacher leadership is also affected by school culture, interpersonal relationships, and pre-existing leadership structures. Traditional norms within the teaching profession that require teachers to be discreet and not take on responsibilities beyond the classroom can clash with the role of a teacher leader, potentially causing antagonism and conflicts with colleagues, thus posing some hindrances to teacher leadership development. Given the importance of teacher leadership to school development and the inherent leadership potential and willingness among teachers (Marks and Printy, 2003), the question of how to promote teacher leadership development in the future is a worthwhile one.



**Figure4.** Co-occurrence network mapping of keywords for leadership research in education

### 5.4. Current Status and Future Trends

To clarify the current state of research and future trends in educational leadership, we have created a strategic coordinate diagram, as depicted in Figure 5. The horizontal axis in the graph represents research concentration, which measures the centrality of the topic. The vertical axis indicates research development, measuring the potential for future advancements. Quadrant 1 (upper right) signifies the most important, well-researched, and future-oriented themes in current educational leadership research, primarily encompassing transformational leadership for school reform and educational leadership for student development. Quadrant 2 (upper left) encompasses topics with promising trends but limited current research, including societal aspects of education such as student health, student demographics, and government governance. Quadrant 3 (lower left) predominantly relates to gender-related topics, with limited existing studies and uncertain future trends. Quadrant 4 (lower right) encompasses topics that are extensively researched in related fields, particularly focusing on social equity, principal leadership, the distributional relationship of leadership between principals and teachers, and school management.



**Figure5.** Strategic coordinates of leadership research in education

## **6. DISCUSSION AND CONCLUSION**

This study conducts a bibliometric analysis of 1284 SSCI documents related to leadership research in education published in recent thirty years. We aim to systematically assess the current state of development and future trends in the field, resulting in the following specific findings.

Firstly, the exploration of educational leadership emerged in the 1980s, coinciding with the U.S. education reform movement. Subsequently, as international educational competition intensified and the teacher accountability movement gained momentum, there was an increased scholarly focus on teacher leadership, which plays a crucial role in student achievement and the overall quality of education in schools. Prior to 2004, the volume of leadership research in education remained relatively stable, with fewer than 20 studies published per year. These studies predominantly concentrated on the impact of conventional administrative figures, such as principals, on schools and teachers. Post-2004, the volume of related studies witnessed a substantial increase, surpassing 90 publications annually between 2019 and 2021. The concept of leadership has evolved, becoming more comprehensive. The notion of distributed leadership, advocating the idea that "everyone has the power to lead," has gained acceptance and recognition. This leadership model compensates for the shortcomings of principal-centered and under-engaged teachers in instructional leadership (Nedelcu, 2013). This trend is consistent with the regional distribution of published papers. The United States is the primary focal point for leadership research in education, followed by the United Kingdom and China. The top five keywords in educational leadership research are "distributed leadership," "transformational leadership," "professional development," "school improvement," and "management." This highlights the significant scholarly interest in the interplay between leadership, school enhancement, and the professional growth of educators. Highly cited papers serve as a reflection of the most pivotal and influential research themes within the field. By scrutinizing these papers, we have identified prominent topics in leadership research in education, encompassing "transformational leadership and instructional leadership," "concepts and roles of leadership in education," "the role of distributed leadership," and "leadership for educational equity."

Besides, educational leadership research has shifted its focus from a vertical hierarchy to a horizontal distribution of leadership styles. The essence of leadership has evolved from the conventional administrative roles to encompass the broader concept of teacher leadership. The fundamental shifts in educational leadership research can be broadly classified into three areas: "research on educational leadership in conventional administrative roles," "exploration of the impact of transformational leadership on school reform," and "examination of the characteristics and significance of distributed leadership." During the exploratory phase, research on educational leadership was relatively constrained, primarily centering on the impact of principal leadership on enhancing student learning outcomes. The leadership approach was predominantly characterized by a top-down linear management style (Leithwood and Jantzi, 1990). As the movement for school change gained momentum, scholars turned their focus towards transformational leadership, which is intricately linked with driving school reform (Marks and Printy, 2003; Hallinger et al., 1996). As educational practices continue to advance, scholars have initiated contemplation regarding the influence of leadership roles on the actualization of leadership. A solitary school leader is insufficient to oversee all facets of school operations. Consequently, distributed leadership has progressively garnered the attention of researchers (Gronn, 2002; Daniëls et al., 2019). The perspective that leadership permeates all levels of the educational institution has gradually gained widespread acceptance.

Finally, leadership research topics in education have become segmented and diversified, emphasizing the pivotal role of leadership in student development, teachers satisfaction, and school reform within the rapidly changing context. At present, research on educational leadership is categorized into three main areas. Firstly, early studies exploring leadership's impact on students and schools, with prominent scholars including Leithwood, Spillane, Murphy, and Fullan (Leithwood, 1994; Spillane, et al., 2001; Murphy, 1992; Fullan, 2004). Secondly, more specialized research focusing on instructional and transformational leadership, with scholars like Hallinger, Marks, and Robinson leading the way (Hallinger et al., 2020; Marks & Printy, 2003; Robinson, 2008). Thirdly, research examining the qualities of exceptional principals and teacher leaders, represented by scholars such as Bush, Day, and Walker (Bush & Glover, 2014; Day et al., 2020; Walker & Slear, 2011). Moreover, the further

segmented knowledge clusters were classified into three categories: exploring the connection between teacher (principal) leadership and student achievement, analyzing the components of teacher leadership from the perspective of distributed leadership, and investigating various leadership models for school establishment and development. Evidently, as educational practices have evolved, research in educational leadership has transitioned from broad concepts like "school leadership" and "educational leadership" to more specific areas such as "instructional leadership," "transformational leadership," "ethical leadership," and "digital leadership." As the understanding of leadership broadens, research on the role of leadership in education has evolved beyond the mere enhancement of student achievement. It now encompasses the advancement of school reform, the cultivation of teacher professional growth, fostering home-school collaboration, and even striving for educational equity.

In general, the exploration of educational leadership finds its roots in practical applications, and its themes have grown in depth and specificity through practical experience. Looking ahead, as educational leadership research continues to evolve, we anticipate a trend toward greater specificity and segmentation of related research areas.

In response to this trend, we advocate for precise definitions of various educational leadership types and the standardization of terminology. We must exercise caution when employing ambiguous terms like "educational leadership" and "school leadership." Specific definitions should be provided when required, and quantitative scales should be established to capture the nuances of various leadership dimensions. In the future, the creation of scales for distinct leadership types should be grounded in a more refined understanding of educational leadership and the advancement of related theories. This will aid in elucidating the nuanced facets of educational leadership within the broader context of teacher leadership, encompassing elements like goal orientation, contributions to school improvement, impact on student achievement, and enhancement of teacher effectiveness. Such clarity will support policymakers in identifying and nurturing various leadership approaches. It is important to note that while we advocate for a clear definition of leadership in education, this does not imply a dichotomy between "backward" and "advanced" leadership. Educators should choose one or a combination of leadership skills to address the problem in the context of the actual situation.

Additionally, when conducting research on leadership, it's essential to consider hierarchy and dimension. For instance, various education levels prioritize distinct objectives. Basic education emphasizes knowledge mastery, vocational education centers on applying knowledge practically, and higher education explores the frontiers of knowledge. Hence, it's crucial to differentiate leadership across different education levels and to specifically examine its connotations and implications. Furthermore, when it comes to leadership roles, it's crucial to recognize that each role carries distinct responsibilities. Therefore, there is a necessity to distinguish and study the leadership within various school roles, including principal leadership, teacher leadership, as well as the more specialized roles like school middle leadership and subject leader leadership.

Finally, a more meticulous study could delve into the outcomes of leadership in education. Day's research used to define students' outcomes not only as academic achievement, but also as attendance, behaviour, engagement and motivation, etc (Day et al., 2020). On this basis, we advocate for a further expansion of the definition of the consequences of educational leadership. For example, current outcome variables include student achievement, teacher development, and school change. In the future, as leadership continues to evolve in emerging educational domains like digital leadership and strategic leadership, there is potential to broaden the scope of research to include additional outcome variables. These may encompass topics such as such discipline construction, talent training system, and organizational research development at the macro level. Furthermore, research could extend to areas like students' critical thinking, innovation and entrepreneurship, and leadership development, or delve into faculty commitment, competence, and sense of belonging at the micro level.

This study still has some limitations. This study does not comprehensively cover the entire scope of the literature. The complexity of educational research is largely attributed to its susceptibility to intricate socio-cultural factors, including country, ethnicity, and religious beliefs on a macroscopic scale, and the type of school, its geographical location, and cultural practices on a microscopic scale. In the future, the literature should be further screened by taking into account factors such as the social

influence and culture context. Additionally, due to space constraints, this paper exclusively examined network mappings like literature co-citation, author co-citation, and keyword co-occurrence, without delving into aspects such as publication volume by country or collaborative networks among institutions. Analysis of additional network mappings in the future can offer a more comprehensive understanding of leadership development in education.

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