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Strategic School Leadership for Developing and Sustaining Professional Learning Communities: A Bibliometric and Thematic Review

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Abstract. Professional learning communities (PLCs) provide a setting for sustained teacher learning, collaboration, and school improvement. Their development and continuity are associated with leadership that establishes direction, supportive conditions, shared responsibility, and professional trust. However, scholarship connecting school leadership and PLCs remains dispersed across educational contexts and leadership perspectives. This bibliometric analysis, complemented by thematic interpretation, mapped publication trends, productivity, citation influence, and conceptual structure. The dataset comprised 314 Scopus-indexed articles, reviews, and conference papers published during 2017–2026 and retrieved on 18 July 2026. Biblioshiny analyzed publication output, sources, affiliations, corresponding authors' countries, and globally cited documents. VOSviewer mapped keyword co-occurrence patterns after terms were standardized using a thesaurus file. Annual output rose overall from 19 documents in 2017 to 59 in 2025, despite fluctuations. The United States led corresponding-author output, while several Asian countries contributed substantially to the field. Analysis of 43 keywords generated six clusters connecting leadership with professional development, collaboration, school culture, teacher learning, agency, self-efficacy, inclusion, and social capital. Temporal patterns indicated movement from teacher learning and principals' practices toward distributed, shared, and middle leadership. Collectively, the literature portrays sustainable PLC development as a multilevel organizational process, although these bibliometric associations do not establish leadership effectiveness. The findings highlight collaborative time, role clarity, professional trust, and contextual adaptation as considerations requiring empirical evaluation. Future research should prioritize longitudinal, multilevel, and cross-national designs, including faith-based, under-resourced, and digitally mediated settings.

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1. Introduction

Schools face growing pressure to improve teaching and learning while responding to educational reform, technological change, teacher well-being concerns, and increasingly diverse student needs. Digital transformation provides new instructional opportunities, although inadequate infrastructure, unequal access, and limited digital competencies continue to constrain its implementation (Khotimah et al., 2025). Schools must also respond to cultural, linguistic, and social diversity through professional practices aligned with students' backgrounds and local circumstances. Evidence from Timor-Leste emphasizes the importance of teacher preparation, relevant resources, and institutional support when addressing cultural diversity in schools (Martins & Reis, 2025). These interconnected demands increase the need for sustained professional learning through which teachers can collectively develop context-responsive practices.

In this context, professional learning communities (PLCs) provide an organizational setting where teachers examine instruction, share professional knowledge, reflect on evidence, and assume collective responsibility. PLCs may refer to formally established groups of teachers organized around shared professional learning. More broadly, the concept views the entire school as a professional learning community integrating individual, collaborative, and collective learning within a supportive environment (de Jong et al., 2025). When embedded within school structures and cultures, PLC initiatives can sustain professional learning, collaborative inquiry, and organizational improvement (Admiraal et al., 2021).

Empirical studies associate PLCs with teacher commitment, self-efficacy, well-being, instructional innovation, and stronger professional practice (Liu Y., 2025; Wang et al., 2025). Recent research has further highlighted the role of PLCs in implementing social-emotional learning. Such communities can strengthen collaboration, professional agency, joint strategy development, job satisfaction, and supportive relationships among teachers (Dou et al., 2026). Together, these contributions position PLCs as an organizational foundation for sustained teacher learning and context-responsive school development. Through PLCs, schools can move beyond episodic professional development toward sustained, collaborative, and context-responsive professional learning.

Establishing a PLC, however, does not automatically ensure its effectiveness, continuity, or integration into everyday school practices. This review conceptualizes strategic school leadership as a multilevel process that connects direction-setting, enabling conditions, distributed responsibility, and reflective adaptation. Leadership provides the necessary organizational conditions, while PLCs create an arena for collective professional learning. Their relationship is therefore relational and context-dependent rather than a universal causal sequence. Principals enact this process by protecting collaborative time, allocating resources, building trust, monitoring progress, and aligning professional inquiry

with school priorities. They may also distribute facilitation, instructional decisions, and knowledge-sharing responsibilities among middle leaders and teachers. Tai and Omar (2022) identified five essential practices: providing support, developing trust, strengthening collaboration, shaping organizational culture, and cultivating teacher agency. Principals additionally create structural, cultural, and relational conditions that embed collaborative learning within teachers' daily work (Haiyan & Allan, 2021). Sustaining PLCs requires cultural and organizational change, alignment with daily practices, and dialogue across personal, interpersonal, and collective levels (de Jong et al., 2025). Leaders' beliefs, interpretations, and responses to organizational tensions may determine whether PLC practices are maintained, adapted, or abandoned (Boom-Muilenburg et al., 2024). Strategic leadership consequently involves initiating PLCs, maintaining their coherence, and adapting them to support long-term school improvement.

Although the relationship between school leadership and PLCs has gained prominence, the knowledge base remains fragmented across leadership models, education systems, school levels, and research traditions. Studies examine transformational, instructional, distributed, ethical, shared, and learning-centered leadership, each emphasizing different processes and leadership actors. PLCs are also conceptualized as teacher groups, professional teams, networks, organizational cultures, or school-wide learning systems. This literature addresses commitment, collective efficacy, professional development, well-being, innovation, and school improvement, making it difficult to trace connections across these areas. Cross-national evidence indicates that leadership, organizational arrangements, policies, and school composition interact when shaping PLC practices (Christensen et al., 2025).

Anglo-American systems often emphasize professional autonomy, whereas East Asian settings may combine collaboration with stronger hierarchical coordination. Similar practices may therefore operate differently across centralized, decentralized, secular, and faith-based educational structures. Moreover, the literature remains geographically weighted toward Anglo-American and European scholarship (Hallinger & Kulophas, 2020). Individual studies cannot fully reveal publication patterns, geographical participation, citation influence, thematic relationships, and emerging directions. A combined bibliometric and thematic review is therefore needed to consolidate this literature and clarify the field's development.

Previous reviews have examined PLCs through different perspectives and analytical scopes. Hallinger and Kulophas (2020) mapped 793 Scopus-indexed documents published between 1960 and 2018, identifying three streams of research on leadership and teacher professional learning. However, they did not specifically examine strategies for developing and sustaining PLCs. Tai and Omar (2022) reviewed 25 Scopus-indexed studies from 2010–2019 and identified five essential principal practices. Their review, however, did not map publication growth, geographical participation, citation influence, or thematic evolution. Hsieh et al. (2025) analyzed 1,309 Web of Science publications using HistCite and VOSviewer, revealing the historical development and major themes of teacher-

community research. Nevertheless, strategic leadership and PLC sustainability remained peripheral. Dou et al. (2026) highlighted leadership and PLCs in relation to social-emotional learning and teacher well-being, but their discussion remained confined to that domain. These reviews advanced knowledge of leadership, professional learning, and teacher communities, yet did not integrate leadership perspectives across geographical contexts. A bibliometric and thematic review focused specifically on strategic school leadership in PLC development and sustainability therefore remains warranted.

This study addresses that gap by placing the relationship between strategic school leadership and PLCs at the center of its analysis. It examines this relationship through an analytical framework connecting strategic direction, enabling conditions, distributed responsibility, collaborative learning, and reflective adaptation. The study maps publication trends and describes the research landscape through leading sources, productive affiliations, corresponding authors' countries, and globally influential documents. It also identifies thematic relationships, changes in research focus over time, and specific topics that warrant further investigation. Because the evidence is bibliometric, the review interprets publication and keyword patterns as scholarly associations rather than direct evidence of leadership effectiveness. The resulting knowledge map can clarify the field's development and help researchers position new studies within established and emerging themes. It can also help practitioners locate relevant evidence while recognizing that bibliometric patterns cannot prescribe effective interventions for particular schools.

The study consequently addresses three research questions concerning publication development, the research landscape, and thematic change:

RQ1: How has annual publication output on strategic school leadership and professional learning communities developed over time?

RQ2: What does the research landscape show regarding leading publication sources, productive affiliations, corresponding authors' countries, and globally cited documents?

RQ3: Which themes have developed in this field, how has research focus changed over time, and which topics warrant further investigation?

2. Methodology

2.1 Research Design

This study adopted a bibliometric design, complemented by thematic interpretation, to map published scholarship rather than to evaluate the effectiveness of particular leadership practices. Bibliometric analysis systematically examines publication growth, scholarly productivity, leading sources, geographical contributions, and citation influence within a defined body of scientific literature (Donthu et al., 2021).

The thematic component interpreted keyword clusters and temporal patterns rather than synthesizing full texts or assessing causal relationships. Combining both approaches revealed the publication development and conceptual structure of research concerning strategic school leadership and sustainable PLCs (Aria &

Cuccurullo, 2017). Consequently, the findings represent patterns and associations within the literature, rather than direct evidence of leadership effectiveness in schools.

2.2 Data Source and Search Strategy

Data were retrieved exclusively from Scopus on 18 July 2026 to ensure a consistent source and standardized bibliographic metadata. Scopus was selected because of its multidisciplinary coverage and structured publication information (Meiliati et al., 2026; Mongeon & Paul-Hus, 2016). The available metadata included authors, affiliations, countries, publication sources, abstracts, keywords, and citation counts. These features support a consistent analysis of publication performance, geographical participation, citation influence, and thematic relationships (Donthu et al., 2021). However, the use of a single database is one limitation of this study, as acknowledged in the section on research limitations.

The search strategy combined established terms describing PLCs, school leadership positions, and leadership approaches. Three co-authors reviewed the terms before data collection to improve conceptual coverage and terminological consistency. No subject-area, language, country, source-type, or open-access restrictions were applied during the initial search. The following query was applied to the title, abstract, and keyword fields:

("professional learning communit" OR "teacher professional learning communit*" OR "school-based professional learning communit*" OR "professional learning team*") AND ("school leadership" OR "school leader*" OR principal* OR principalship OR headteacher* OR "head teacher*" OR "school administrator*" OR "educational leadership" OR "instructional leadership" OR "transformational leadership" OR "distributed leadership" OR "strategic leadership" OR "shared leadership")*

2.3 Document Selection Process

Document selection followed PRISMA guidelines to ensure transparent reporting of identification, screening, eligibility assessment, and final inclusion (Page et al., 2021). Figure 1 presents the selection stages and document counts. Records were included when they matched both query blocks, were indexed by the retrieval date, and met the publication-year and document-type criteria. Topical relevance was operationalized through a conjunctive query that required PLC-related and school-leadership terms in the searched metadata. No additional post-retrieval title or abstract relevance exclusions were applied.

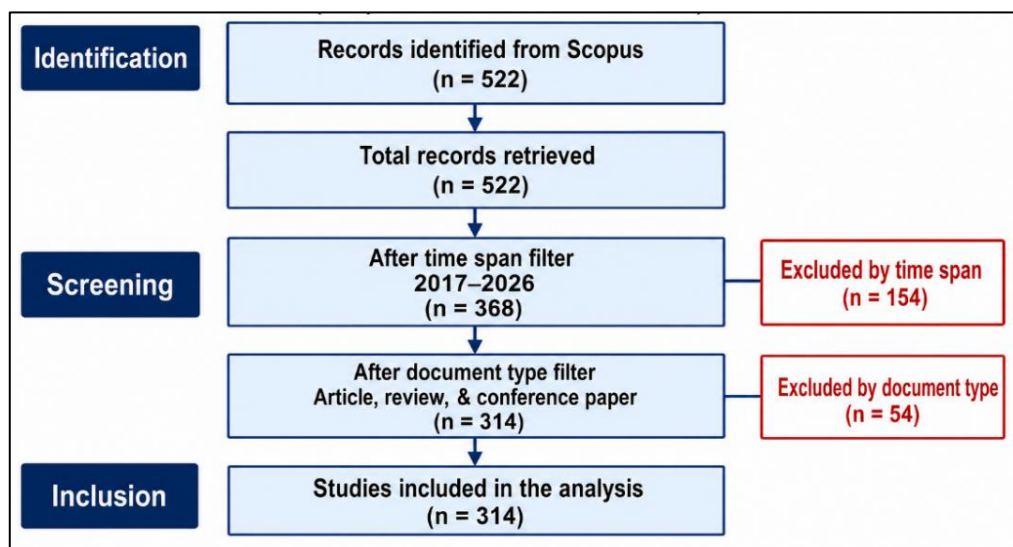


Figure 1: PRISMA Flow Diagram of the Document Selection Process (Source: Adapted from Page et al. (2021))

Figure 1 shows that the initial conjunctive search retrieved 522 documents before publication-year and document-type restrictions. Restricting publication years to 2017–2026 retained 368 documents and excluded 154 earlier records. Records from 2026 covered publications indexed through 18 July 2026. Subsequent eligibility assessment retained articles, reviews, and conference papers because they provided suitable bibliographic and conceptual information. Excluding 54 records from other document types yielded a final dataset of 314 documents. The complete metadata were exported in CSV format for analysis using Biblioshiny and VOSviewer.

2.4 Data Analysis

Data were analyzed using Biblioshiny and VOSviewer, which provided complementary functions for performance analysis and thematic visualization (Meiliati et al., 2026; Melisa et al., 2025). Biblioshiny is the web-based interface of the Bibliometrix package within the R environment (Aria & Cuccurullo, 2017). It was used to calculate annual publication output and identify the most relevant publication sources. Further analyses identified productive affiliations, corresponding authors' countries, and documents receiving the highest global citation counts (Salido et al., 2025). Corresponding-author output was separated into single-country publications and multiple-country publications to describe domestic and cross-national authorship patterns.

Document influence was measured using total citations, annualized citations, and normalized total citations, all generated in Biblioshiny. Normalized total citations compared each document's citation count with the average citation performance of documents published during the same year. The ten leading entries in each category summarized productivity, geographical participation, collaboration patterns, and citation influence within the selected literature. These indicators were interpreted descriptively, without inferential testing or claims about the comparative effectiveness of leadership approaches.

VOSviewer was used to examine the conceptual structure through keyword co-occurrence mapping (Melisa et al., 2025). The analysis used all keywords, full counting, and a minimum threshold of four occurrences. Forty-three keywords met this threshold and formed six clusters under the software's standard clustering configuration. Association-strength normalization was used to calculate keyword-relatedness, while network and overlay visualizations displayed thematic relationships and average publication years—a thesaurus file consolidated synonyms, abbreviations, spelling variants, and singular or plural forms. Country names and generic methodological terms were excluded because they did not represent substantive themes.

Keyword clusters and temporal patterns were interpreted as scholarly associations rather than causal relationships. Three additional researchers reviewed the visualizations, cluster membership, and thematic explanations. Interpretive differences were discussed collectively until all researchers reached consensus on cluster descriptions and temporal narratives.

3. Results

3.1 Annual Publication Growth

Figure 2 presents the annual publication output on strategic school leadership in the development and sustainability of professional learning communities during 2017–2026. The dataset contained 314 documents, comprising articles, review papers, and conference papers. Annual output fluctuated during the period but followed an overall upward trend through 2025.

Publication output began with 19 documents in 2017 and increased slightly to 20 in 2018. The number rose to 24 in 2019 and 34 in 2020. It then declined to 24 documents in 2021 before recovering to 29 in 2022. A marginal decrease to 28 documents occurred in 2023, followed by a sharper increase to 45 in 2024. Output reached its highest level in 2025, with 59 documents. As of 18 July 2026, 32 documents had been indexed for 2026.

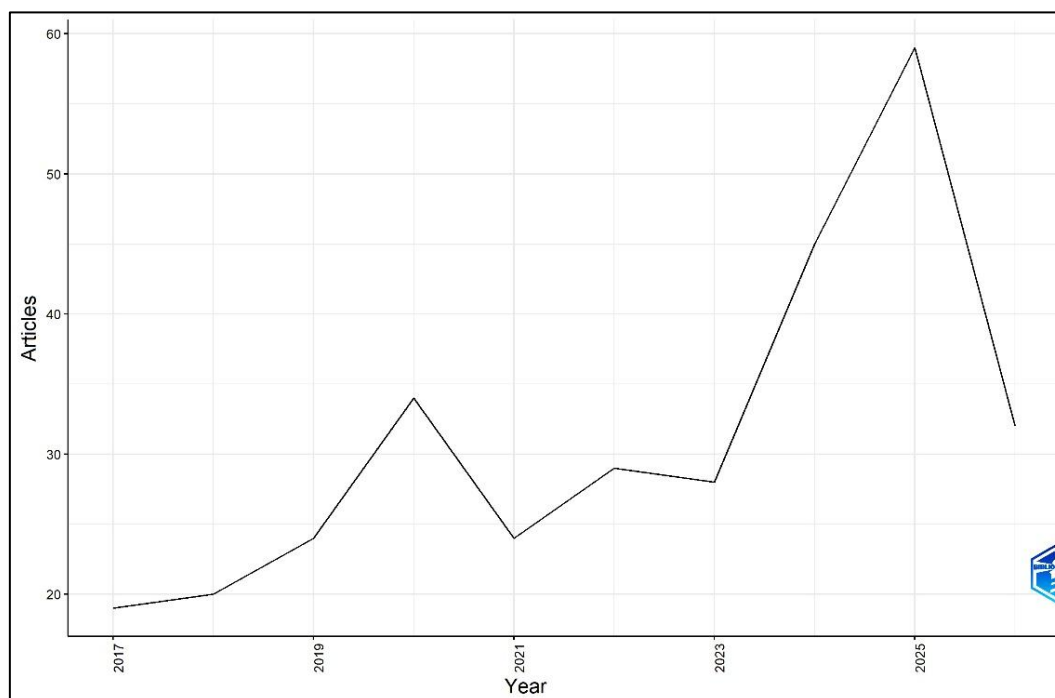


Figure 2: Annual Scientific Production, 2017–2026 (Source: Authors' analysis using Biblioshiny)

3.2 Landscape of Research Productivity and Scholarly Influence

Figure 3 presents the ten most relevant publication sources, ranked by the number of documents addressing strategic school leadership and professional learning communities. Figure 3 shows that the Educational Management Administration & Leadership and Professional Development in Education shared the leading position, with 15 documents each. Education Sciences followed them with 12 documents, and the International Journal of Leadership in Education with 10. Frontiers in Education published eight documents. Three sources—Journal of Professional Capital and Community, Leadership and Policy in Schools, and Teaching and Teacher Education—each published seven documents. The International Journal of Educational Management and Journal of Educational Administration completed the ranking with six documents each.

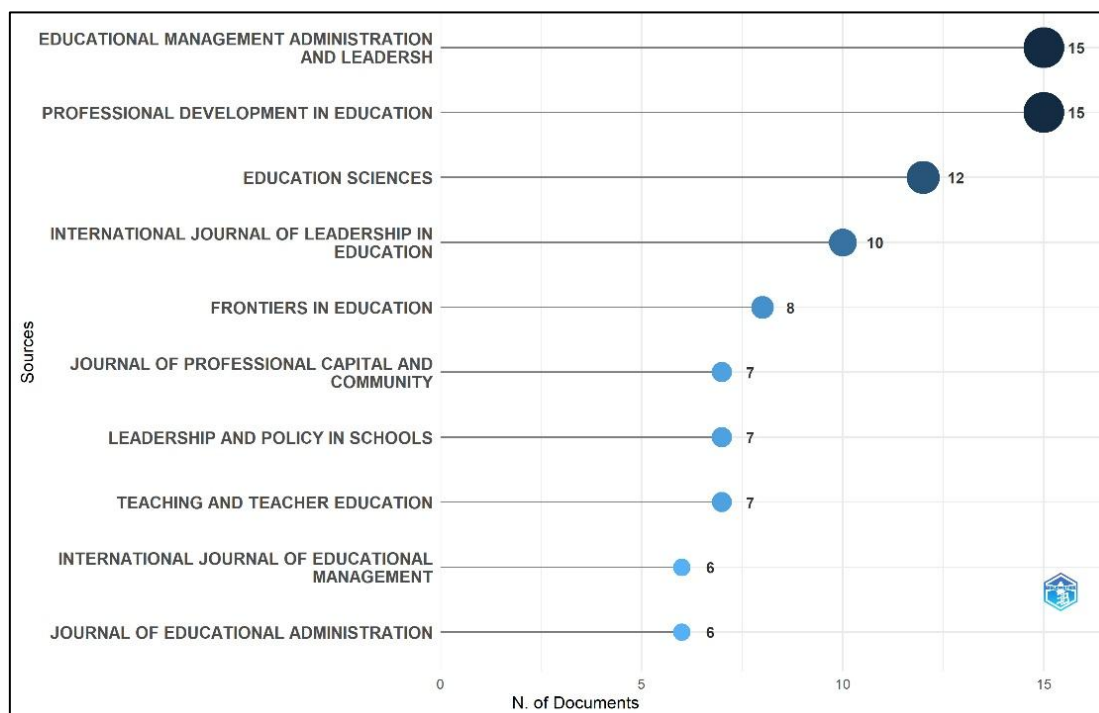


Figure 3: Ten Most Relevant Publication Sources (Source: Authors' analysis using Biblioshiny)

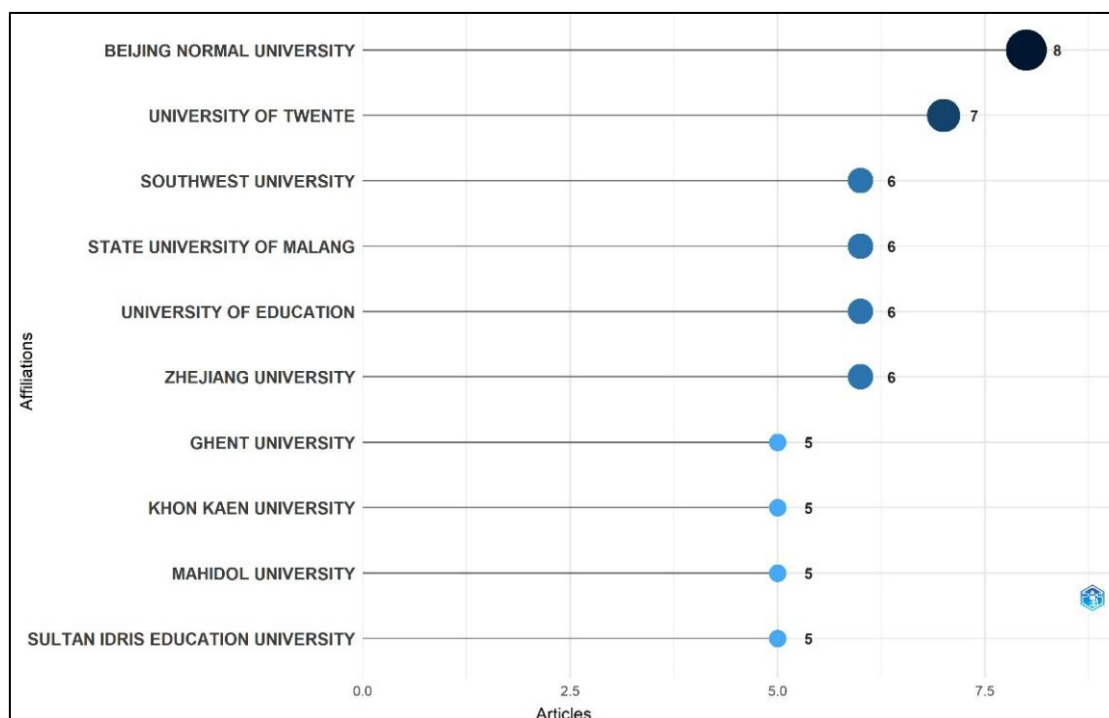


Figure 4: Ten Most Productive Affiliations (Source: Authors' analysis using Biblioshiny)

The ten most productive affiliations are displayed in Figure 4. Beijing Normal University led with eight documents, followed by the University of Twente with seven. Southwest University, State University of Malang, University of Education,

and Zhejiang University each contributed six documents. Ghent University, Khon Kaen University, Mahidol University, and Sultan Idris Education University each contributed five. Publication output across these institutions fell within a relatively narrow range of five to eight documents. Figure 5 presents the distribution of publications according to the corresponding authors' countries.

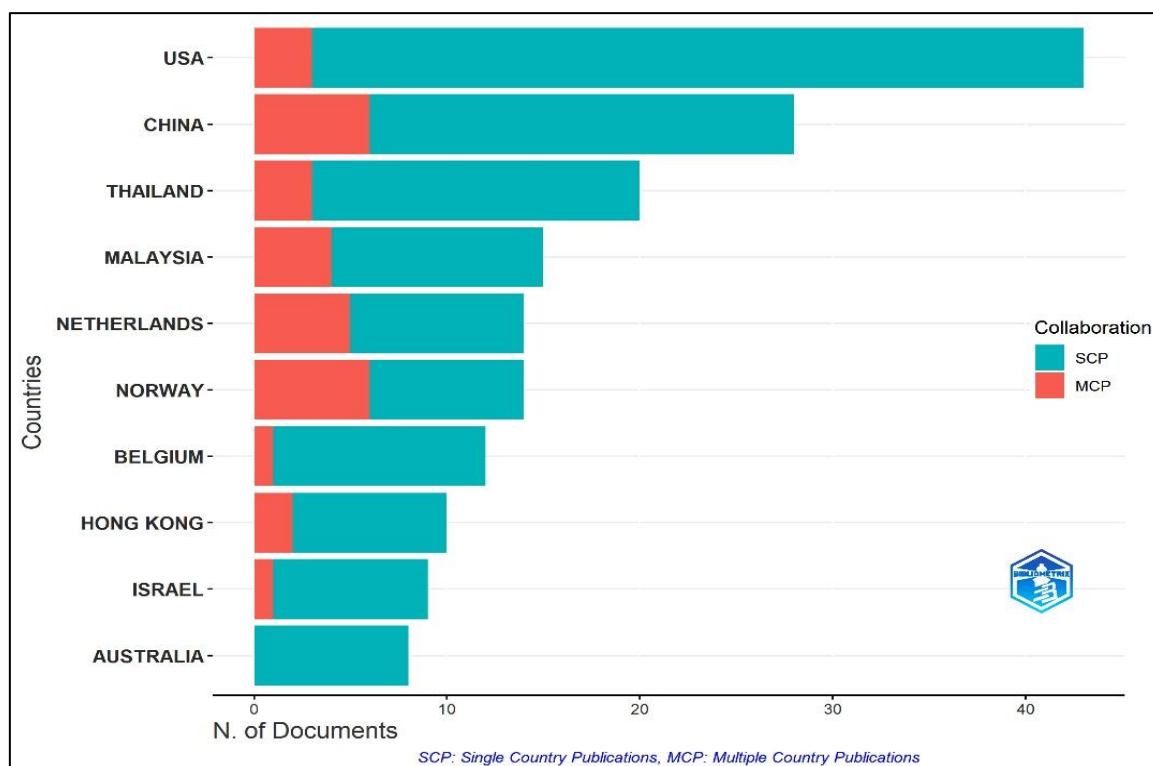


Figure 5: Ten Leading Countries of Corresponding Authors (Source: Authors' analysis using Biblioshiny)

The United States led with 43 documents, consisting of 40 single-country publications (SCPs) and three multiple-country publications (MCPs). China ranked second with 28 documents, including 22 SCPs and six MCPs. Thailand produced 20 documents, while Malaysia contributed 15. The Netherlands and Norway each recorded 14 documents, followed by Belgium with 12, Hong Kong with 10, Israel with nine, and Australia with eight. SCPs outnumbered MCPs in every country included in the ranking. Australia recorded only SCPs, whereas Norway had the highest proportion of MCPs among the ten leading countries.

Table 1 presents the ten documents with the highest global citation counts. Vangrieken et al. (2017) ranked first with 465 total citations, an annual average of 46.5 citations, and a normalized total citation score of 10.10. Admiraal et al. (2021) ranked second with 206 citations and an annual average of 34.3. Dong et al. (2020) received 188 citations, followed by Zheng et al. (2019) with 163. Dong et al. (2020) achieved a normalized citation score of 8.32, slightly exceeding the 8.04 recorded by Admiraal et al. (2021).

The remaining six documents received between 72 and 94 global citations. Hallinger and Kulophas (2020) recorded 94 TC, followed by Brodie (2021) with 91 and Yin and Zheng (2018) with 81. Park et al. (2019) received 75 TC, Luyten and Bazo (2019) received 74, and Haiyan and Allan (2021) received 72. Based on annual citation averages, Brodie (2021) recorded 15.2 TC/Y, while Haiyan and Allan (2021) recorded 12 TC/Y. These annual averages exceeded those of several earlier publications included in the top ten.

Table 1: Ten Documents with the Highest Global Citation Counts (Source: Authors' analysis using Biblioshiny)

Paper	DOI	TC	TC/Y	NTC
Vangrieken et al. (2017), Teach Educ	10.1016/j.tate.2016.10.001	465	46,5	10,10
Admiraal et al. (2021), Prof Dev Educ	10.1080/19415257.2019.1665573	206	34,3	8,04
Dong et al. (2020), Asia Pac Educ Res	10.1007/s40299-019-00461-5	188	26,9	8,32
Zheng et al. (2019), Educ Manage Adm Leadersh	10.1177/1741143218764176	163	20,4	6,84
Hallinger and Kulophas (2020), Prof Dev Educ	10.1080/19415257.2019.1623287	94	13,4	4,16
Brodie (2021), Prof Dev Educ	10.1080/19415257.2019.1689523	91	15,2	3,55
Yin and Zheng (2018), Teach Educ	10.1016/j.tate.2018.09.002	81	9	3,81
Park et al. (2019), Educ Adm Q	10.1177/0013161X18821355	75	9,4	3,14
Luyten and Bazo (2019), Stud Educ Eval	10.1016/j.stueduc.2018.11.002	74	9,2	3,10
Haiyan and Allan (2021), Prof Dev Educ	10.1080/19415257.2020.1770839	72	12	2,81

Note: TC = Total Citations; TC/Y = Total Citations per Year; NTC = Normalized Total Citations

3.3 Thematic Structure and Development of Research

The thematic analysis included 43 keywords that met the minimum threshold of four occurrences. Six thematic clusters emerged, as presented in Figure 6 and Table 2. Node size represents the frequency with which a keyword occurred, while connecting lines indicate relationships among keywords. The professional learning community formed the largest node and occupied a central position in the network. It was connected to professional development, leadership, school leadership, school principals, and several other concepts.

The first cluster comprised 15 keywords associated with principal leadership, educational contexts, inclusion, and teacher capacity development. It also included communities of practice, social capital, and general indexing terms such as human and male. The second cluster contained eight keywords related to collaborative leadership in school change and improvement. This cluster connected distributed and shared leadership with collaboration, school culture, lesson study, school improvement, and teacher learning. The third cluster brought together seven keywords concerning professional learning, curriculum, teaching, and middle leadership across different levels of education.

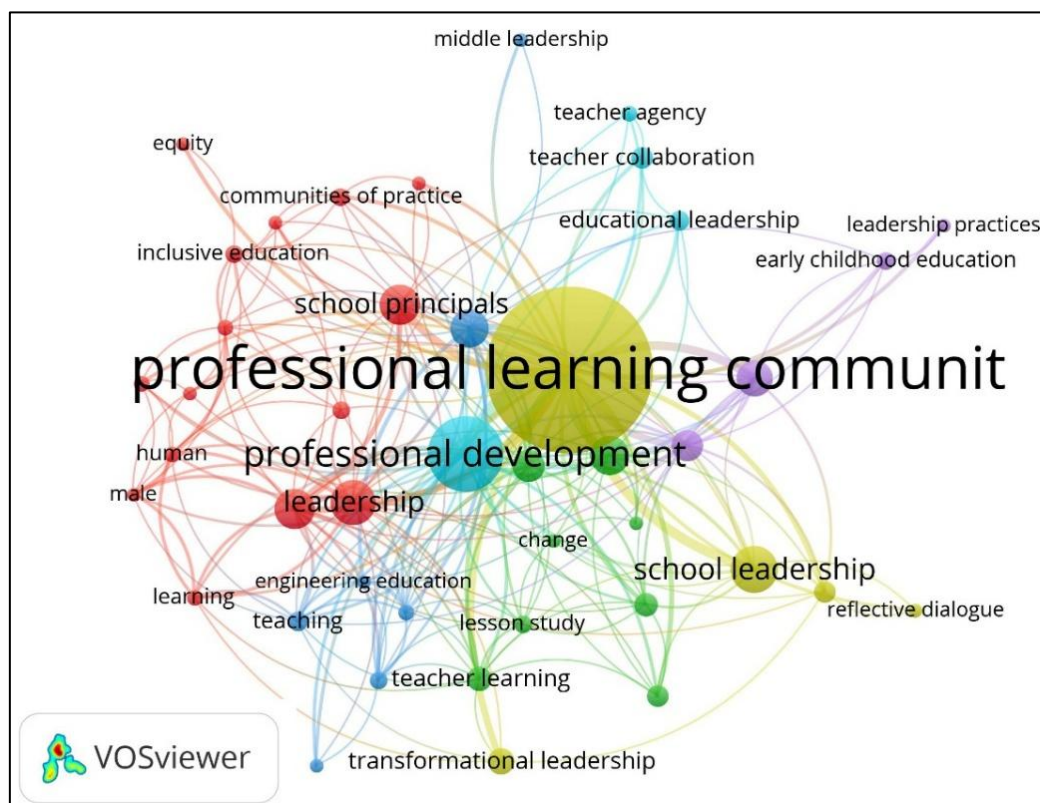


Figure 6: Keyword Co-occurrence Network and Thematic Clusters (Source: Authors' analysis using VOSviewer)

Table 2: Thematic Clusters Based on Keyword Co-occurrence Analysis (Source: Scopus data processed using VOSviewer)

Cluster (Number of items)	Keywords
The first (15)	communities of practice; education; equity; human; inclusive education; leadership; learning; male; primary schools; school; school principals; social capital; teacher; teacher education; teacher training
The second (8)	change; collaboration; distributed leadership; lesson study; school culture; school improvement; shared leadership; teacher learning
The third (7)	curriculum; engineering education; middle leadership; professional aspects; professional learning; secondary education; teaching
The fourth (5)	professional learning community; reflective dialogue; school leadership; teacher self-efficacy; transformational leadership
The fifth (4)	early childhood education; instructional leadership; leadership practices; teacher leadership
The sixth (4)	educational leadership; professional development; teacher agency; teacher collaboration

The fourth cluster contained five keywords connecting PLCs with school leadership, transformational leadership, reflective dialogue, and teacher self-efficacy. The fifth cluster consisted of four keywords concerning instructional leadership practices and teacher leadership, including their application in early

childhood education. The sixth also comprised four keywords and linked educational leadership with professional development, teacher agency, and teacher collaboration. Figure 7 presents the temporal distribution of keywords by their average publication years.

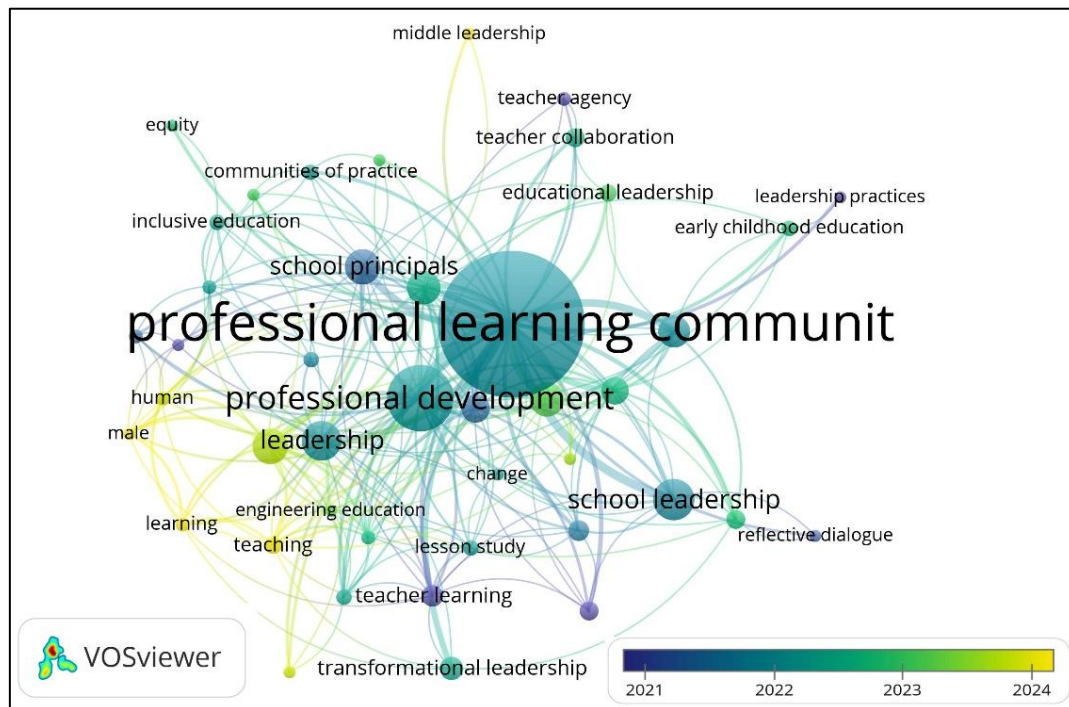


Figure 7: Overlay Visualization of Shifts in Research Focus Based on the Average Publication Year of Keywords (Source: Authors' analysis using VOSviewer)

The overlay visualization in Figure 7 displays the temporal distribution of research topics, based on the average publication year for each keyword. Keywords associated with the earlier period, 2017–2021, included teacher learning, school principals, school improvement, teacher agency, and leadership practices. Other early themes included reflective dialogue, collaboration, teacher education, and teacher training. Keywords averaging between 2022 and 2023 included professional learning communities, school leadership, professional development, and transformational, instructional, and teacher leadership. This period also encompassed professional learning, curriculum, lesson study, inclusive education, equity, communities of practice, and teacher collaboration. Keywords with average publication years around 2024 included shared, middle, and distributed leadership, social capital, primary schools, and secondary education. General indexing terms, including human and male, also appeared in this recent area but were not interpreted as substantive themes.

4. Discussion

4.1 Growth and Development of Research on Strategic Leadership and PLCs

Scholarly interest in strategic school leadership and professional learning communities expanded overall, despite fluctuations in annual publication output. This trend is evident in the increase from 19 publications in 2017 to 59 in 2025. The pattern is consistent with Hallinger and Kulophas (2020), who reported

accelerating growth in research on leadership and teacher professional learning. The field also draws on the systematic review by Vangrieken et al. (2017), which identified supportive leadership, trust, and group dynamics as important conditions for teacher communities. Subsequent studies have examined the mechanisms connecting leadership and PLCs in greater detail. Zheng et al. (2019) found that instructional leadership influenced teacher self-efficacy through collaborative activity, de-privatized practice, and reflective dialogue. Luyten and Bazo (2019) similarly showed that transformational leadership affected teaching practices through PLCs and teacher learning. Together, these studies indicate increasing scholarly attention to leadership conditions and mechanisms associated with PLC development and sustainability.

Although pandemic-related changes may have influenced scholarly interest, annual publication counts alone cannot establish COVID-19 as the cause of this growth. The sharper increase after 2023 instead indicates renewed publication activity within a field encompassing increasingly varied leadership perspectives. The United States produced the most publications by corresponding authors, while China, Thailand, and Malaysia made substantial contributions from Asia. Beijing Normal University's position as the most productive affiliation further reflects the prominence of PLC research in China. Studies conducted in the country have connected PLCs with instructional leadership, distributed leadership, teacher trust, and self-efficacy (Yin & Zheng, 2018; Zheng et al., 2023; Zheng & Luo, 2024).

More recent research has extended this discussion to relationships between transformational leadership and teacher commitment (Wang et al., 2025) and between moral leadership and trust in principals (Qu et al., 2025). A similar development is evident in Thailand, where researchers have examined relationships among transformational leadership, PLCs, collective efficacy, and student achievement (Prasertcharoensuk et al., 2021). These empirical studies illustrate the range of leadership models examined across national contexts, although their findings should not be assumed universally applicable. The 2026 publication count should not be interpreted as evidence of decline because the dataset covers publications indexed only through 18 July 2026.

4.2 Distribution of Productivity and Scholarly Influence across Research Landscape

The distribution of publication outlets indicates that research on strategic leadership and PLCs lies at the intersection of several fields, including educational administration, school leadership, professional development, and teacher education. Educational management journals tend to publish studies of leadership behavior and organizational conditions. Professional development journals place greater emphasis on teacher learning, collaboration, agency, and community sustainability. This distribution portrays PLCs as part of broader organizational and professional learning discussions rather than isolated teacher-development activities.

The relatively narrow productivity range among leading affiliations suggests that knowledge production is not concentrated within one institution. These institutions nevertheless demonstrate different research orientations across their contributions to the field. Studies involving Chinese institutions frequently employ quantitative models to test relationships among leadership, PLCs, trust, self-efficacy, and teacher commitment (Dong et al., 2020; Wang et al., 2025; Zheng et al., 2019). Research involving the University of Twente places greater emphasis on PLC sustainability, knowledge brokerage, and leaders' interpretations of school change (Boom-Muilenburg et al., 2022, 2024). These orientations broaden the literature by combining variable-based explanations with examinations of the organizational processes associated with sustainable PLC development.

The substantial output from Asian countries underscores their prominence in the current research landscape. This pattern offers a contemporary comparison with Hallinger and Kulophas (2020), who identified the historical dominance of Anglo-American and European scholarship. Nevertheless, the prevalence of single-country publications indicates that much of the research remains situated within individual national education systems. This concentration matters because cultural norms, hierarchical arrangements, and institutional incentives may shape leadership, trust, and collaboration differently across settings.

In China, for example, Yin and Zheng (2018) found that trust in principals and trust among colleagues were related differently to PLCs. Evidence from Timor-Leste similarly emphasizes that educational change requires sustained professional development, institutional support, and alignment with local social contexts (Martins & Reis, 2025). Norway's relatively high proportion of MCPs reflects a contrasting authorship pattern characterized by greater cross-national participation. However, this indicator describes publication authorship and does not constitute a complete co-authorship or knowledge-flow network.

Citation patterns suggest that influential publications tend to offer either conceptual syntheses or clear explanations of relationships among key concepts. The review by Vangrieken et al. (2017) provided a classification of teacher communities and identified supporting conditions across educational contexts. Admiraal et al. (2021) linked PLC sustainability to the integration of interventions into school organization and culture. Dong et al. (2020) and Zheng et al. (2019) extended this knowledge by examining the roles of school support, instructional leadership, and teacher self-efficacy. Their conceptual relevance, methodological contribution, and applicability across related research contexts may partly explain their citation influence.

Viewed collectively, these influential publications provide a foundation for examining how principals develop and sustain PLCs. Recurring elements include supportive leadership, a shared vision, trust, collaboration, and the integration of PLCs into school culture (Admiraal et al., 2021; Vangrieken et al., 2017; Zheng et al., 2019). More recent studies have expanded this foundation by examining distributed, teacher, and moral leadership (Qu et al., 2025; Zheng et al., 2023). The literature has consequently broadened from identifying enabling conditions

toward examining roles performed by principals, middle leaders, and teachers. These patterns suggest that PLC sustainability is increasingly studied through the lens of the alignment among organizational support, professional relationships, and collaborative learning.

4.3 Thematic Structure of Strategic Leadership in PLC Development and Sustainability

The six clusters identified in the analysis collectively characterize strategic leadership within a PLC as a multidimensional organizational process. This process integrates direction setting, organizational support, shared responsibility, and sustained professional learning. The clusters do not represent separate or competing traditions because their keywords are interconnected throughout the co-occurrence network. The first cluster emphasizes leadership, inclusion, teacher capacity, and social capital, whereas the second and third connect distributed roles with school improvement and instruction. The remaining clusters link specific leadership approaches with reflective dialogue, self-efficacy, teacher agency, collaboration, and professional development. These relationships represent conceptual proximity within the literature rather than evidence that one leadership approach produces particular PLC outcomes.

The direction of PLC development is associated with equity, inclusion, learning, and the strengthening of teacher capacity. Babić et al. (2018) emphasized that school practices and culture are central to implementing inclusive education. PLCs may support this agenda through reflective dialogue and shared responsibility, although collaboration does not necessarily produce equity-oriented changes (Ahn et al., 2025). Research in culturally diverse primary schools also shows that inclusive change requires professional training, relevant resources, and alignment with community contexts (Martins & Reis, 2025). The presence of social capital highlights the scholarly importance assigned to networks, trust, and professional relationships. Together, these elements provide structural, cognitive, and relational resources for developing principals and schools (Romanowski, 2022).

The connections among distributed, shared, middle, and teacher leadership indicate that PLC scholarship considers actors across multiple organizational levels. Principals establish structures that enable teachers and middle leaders to assume meaningful responsibilities. García-Martínez et al. (2018) associated distributed leadership with organizational flexibility, collaboration, and teacher empowerment. The distribution of leadership, however, may vary according to school structure and context (Modeste et al., 2022). Lee and Ip (2023) found that principals' instructional and middle leadership supported PLCs, thereby strengthening informal teacher leadership. Middle leaders may also contribute more effectively when teachers participate in decision-making (Yeap & Ali, 2025). Connections with curriculum, teaching, and lesson study further locate leadership within everyday instructional practices rather than administrative structures alone. Lesson study, for example, can reshape teachers' educational beliefs and school culture through practice-based learning (Khokhotva & Albizuri, 2020).

The clusters involving transformational and instructional leadership correspond with empirical studies examining mechanisms associated with PLC development. Transformational leadership can strengthen collective responsibility, while teacher self-efficacy supports participation in reflective dialogue (Valckx et al., 2020). Instructional leadership also influences PLCs through teachers' responsibility and perceptions of procedural justice within schools (Liu S. & Hallinger, 2024). Under distributed leadership, PLCs provide a pathway through which leadership practices contribute to teachers' professional development (Yang & Chang, 2024). Collectively, the mapped themes portray PLC development as involving strategic direction, role distribution, collaboration, and reflection across organizational levels. The empirical studies represented within these themes associate sustainability with embedding such processes in school culture, structures, and instructional routines.

4.4 Thematic Evolution and Future Research Agenda

The temporal distribution of keywords suggests movement from teacher learning and principals' practices toward greater attention to multilevel leadership arrangements. PLCs are increasingly discussed as settings in which principals, middle leaders, and teachers perform interrelated roles. The recent appearance of distributed leadership, shared leadership, middle leadership, and social capital corresponds with this development. García-Martínez et al. (2018) linked distributed leadership with collaboration, organizational flexibility, and teacher empowerment. Subsequent research showed that PLCs mediated the relationship between distributed leadership and teacher professional development (Yang & Chang, 2024). Middle leadership has also gained importance because it can strengthen teacher participation in decision-making (Yeap & Ali, 2025). These patterns indicate growing scholarly attention to leadership configurations extending beyond the actions of individual principals.

This multilevel perspective opens four specific avenues for further investigation. First, future studies should examine how principals, middle leaders, and teachers divide strategic responsibilities throughout PLC initiation, implementation, evaluation, and adaptation. Longitudinal and multilevel designs could distinguish formal role assignments from leadership enacted in everyday practice. One guiding question is how different distributions of authority influence teacher participation, trust, and PLC continuity across school contexts. Faith-based schools deserve particular attention because hierarchical structures and institutional values may influence the distribution of authority. Amin et al. (2024) found that clearly defined criteria did not guide the distribution of roles in two Islamic secondary schools.

Second, research should investigate which combinations of trust, professional networks, leadership support, and social capital sustain equity-oriented PLCs in under-resourced schools. This question is important because collaborative cultures do not always produce equitable changes in practice (Ahn et al., 2025). Studies conducted over several years could determine whether PLCs become embedded in school culture or remain dependent on particular programs and leaders (Boom-Muilenburg et al., 2024; de Jong et al., 2025).

Third, research should examine how principals distribute authority, maintain participation, and protect trust within online, hybrid, and AI-supported PLCs. Rasdiana et al. (2024) found that PLCs mediated the relationship between principals' digital leadership and teachers' technological innovation skills. Liu, P. et al. (2025) further showed that online PLCs can move toward shared leadership when teachers, academics, and policymakers participate adaptively. Evidence from Indonesian teachers also identifies infrastructure, unequal access, and digital skills as ongoing constraints on the implementation of educational technology (Khotimah et al., 2025). Future studies could therefore examine how AI-supported platforms influence participation, knowledge sharing, professional agency, and the distribution of authority within virtual PLCs.

Fourth, longitudinal research should examine how PLC participation relates to teacher well-being, commitment, instructional practice, and student learning across time. Such studies could track workload, self-efficacy, job satisfaction, commitment to change, teaching quality, and student outcomes. This work would move PLC evaluation beyond participation measures while distinguishing associations, mediating processes, and longer-term organizational outcomes (Liu, P. et al., 2025; Xiu et al., 2026).

4.5 Implications for Sustainable PLC Development

As a bibliometric review, this study provides a knowledge map of the scholarly foundations associated with sustainable PLC development. The field draws on transformational, instructional, distributed, shared, middle, and teacher leadership. These streams offer complementary perspectives on direction setting, instructional support, responsibility distribution, and teacher participation. Reflective dialogue, self-efficacy, teacher agency, school culture, and social capital provide additional concepts for examining PLC implementation and sustainability. This knowledge map can assist researchers in selecting concepts, developing relational models, and positioning new studies within the existing intellectual structure.

For school leaders, the mapped literature identifies considerations that require contextual testing rather than direct or universal adoption. These include protecting collaborative time, aligning PLC activities with instructional priorities, clarifying leadership roles, supporting reflective dialogue, and building professional trust. Principals may involve middle leaders and teachers in decision-making while ensuring that distributed responsibilities remain aligned with shared school priorities. Leadership development programs could consequently address instructional guidance alongside the relational skills required to sustain collaborative professional learning.

For policymakers, the prominence of single-country research demonstrates the importance of evaluating PLC frameworks within particular cultural, institutional, and resource environments. Policies may support collaborative time, leadership preparation, digital infrastructure, and professional learning while allowing adaptation to local needs. Comparative, longitudinal, and multilevel studies remain necessary to explain changes across individual, group, school, and

system levels, particularly within underexamined faith-based settings. However, bibliometric patterns map available scholarship rather than prove that particular leadership practices will produce sustainable PLCs. Accordingly, identified leadership models should be empirically evaluated before implementation within specific educational settings.

5. Conclusion

This study mapped research on strategic school leadership in the development and sustainability of PLCs between 2017 and 2026. The analysis of 314 documents showed an overall upward publication trajectory, despite annual fluctuations and incomplete coverage for 2026. The field spans school leadership, educational administration, professional development, and teacher education across diverse institutional and national contexts. Asian countries demonstrated substantial visibility, while the United States led corresponding-author output and single-country publications remained more common than cross-national publications.

Six keyword clusters connected leadership with professional development, collaboration, school culture, teacher learning, agency, self-efficacy, inclusion, and social capital. Collectively, the mapped literature portrays strategic leadership as a multilevel process involving direction setting, instructional support, responsibility distribution, professional collaboration, and reflective adaptation. These relationships represent conceptual associations rather than direct evidence that particular leadership practices produce sustainable PLCs.

Building on this synthesis, the findings offer several considerations for educational practice and future research. School leaders may consider protecting collaborative time, clarifying leadership roles, building professional trust, and aligning PLC activities with instructional priorities. Future studies should examine how principals, middle leaders, and teachers distribute responsibilities across different organizational and cultural settings. Longitudinal, multilevel, and cross-national research could clarify how PLCs develop and become embedded within school structures. Further investigation is also warranted in faith-based, under-resourced, and digitally mediated settings, including AI-supported virtual PLCs.

However, these implications should be interpreted within the study's methodological boundaries. Reliance on Scopus limited coverage of publications indexed in other international and regional databases. Metadata and keyword analysis also prevented detailed assessment of theories, methods, educational contexts, and evidence concerning leadership effectiveness. Future reviews could address these limitations by combining multiple databases with systematic full-text analysis or meta-analysis. Such approaches would provide a more comprehensive understanding of leadership strategies, their underlying mechanisms, and their context-dependent outcomes.

Conflict of Interest

The authors declare that there are no conflicts of interest regarding the publication of this manuscript.

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7. Declaration of Generative AI and AI-Assisted Technologies

During the preparation of this manuscript, the authors used ChatGPT 5.6 (OpenAI) to support English translation, improve readability, and proofread the text. Grammarly was also used to check grammar, spelling, and language consistency. The authors reviewed and revised all AI-assisted outputs and take full responsibility for the accuracy, integrity, and final content of the manuscript.

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