# Global Research Patterns in Teacher Education Quality Management: A VOSviewer-based Scientometric Study

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**A B S T R A C T**

This bibliometric analysis explores the evolving landscape of research on quality management in teacher education, with a focus on identifying influential authors, key collaboration networks, and emerging thematic clusters. Using VOSviewer software, Scopus-based data were extracted and visualized to map co-citation, co-authorship, and bibliographic coupling patterns across the field. The findings reveal that several Western scholars have been particularly influential, contributing foundational work on reflective practice, teacher identity, and professional development. Geographically, the United States, United Kingdom, and Australia dominate the bibliographic coupling landscape, while countries such as South Africa, Malaysia, and the Netherlands demonstrate increasing engagement, indicating a more diversified global research effort. Thematic analysis of keyword co-occurrence and co-citation clusters reveals five major research fronts: reflective and collaborative practice, mentorship and learning communities, accountability and performance measurement, inclusive education, and digital transformation in teacher preparation. These findings have important implications for global education policy and research, particularly in advancing Sustainable Development Goal 4 (SDG 4)—which advocates for inclusive, equitable, and quality education. The study underscores the need for increased international collaboration, interdisciplinary research, and greater representation from under-researched regions. By highlighting key contributors and trends, this analysis provides a roadmap for future inquiry and capacity-building efforts aimed at enhancing teacher education quality on a global scale.

## 1. INTRODUCTION

The quality of teacher education remains a pivotal concern in the global quest to enhance educational outcomes and foster sustainable knowledge societies. As the backbone of national education systems, teacher education programs play a critical role in shaping not only the professional competencies of future educators but also the adaptability, equity, and long-term performance of educational institutions. In an era marked by globalization, rapid technological innovation, and evolving societal expectations, the frameworks used to evaluate and improve teacher preparation must likewise evolve in complexity and scope.

A central mechanism in this evolution is the integration of quality management (QM) principles into teacher education. Quality management in education refers to the systematic planning, implementation, monitoring, and evaluation of institutional practices to ensure they meet clearly defined standards of excellence, effectiveness, and efficiency. In the context of teacher education, QM encompasses a broad array of strategies—ranging from Total Quality Management (TQM) models to performance audits, accreditation systems, and continuous improvement processes—that seek to elevate curricular coherence, pedagogical practices, administrative accountability, and student learning outcomes (Baldovino & Nivera, 2021). While quality assurance mechanisms have long been embedded within higher education governance, their targeted application to teacher education has gained renewed global prominence over the past two decades. This shift is driven by intensified calls for accountability,

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inclusiveness, and innovation in how teachers are prepared—particularly as countries work to achieve SDG 4: ensuring inclusive and equitable quality education and promoting lifelong learning opportunities for all. As such, quality management is no longer a peripheral concern, but a central pillar in the strategic transformation of teacher education systems worldwide.

Globally, different countries have adopted distinct approaches to embedding quality management in teacher education. In Singapore, for example, a system-wide emphasis on continuous improvement and reflective teaching has led to the integration of process-oriented quality models within teacher training institutions (Ng, 2013). In the Philippines, empirical studies demonstrate how TQM-related dimensions—such as student focus, leadership, and stakeholder engagement—are positively associated with teaching effectiveness (Baldovino & Nivera, 2021). Similarly, countries in Europe and sub-Saharan Africa have aligned teacher education standards with international quality frameworks to enhance graduate competence and institutional credibility (Al-Samarrai et al., 2023). Despite the growing body of literature on quality management in teacher education, few studies have systematically mapped this research area to understand its intellectual structure, key contributors, and thematic evolution. This is where bibliometric analysis offers substantial value. Bibliometric methods—particularly those involving citation analysis, co-authorship mapping, and keyword co-occurrence—are increasingly used to assess the development and impact of research fields (Donthu et al., 2021). By applying these methods to teacher education QM literature, scholars can trace influential publications, identify core research themes, and uncover collaboration networks that shape scholarly discourse.

The objective of this study is to conduct a comprehensive bibliometric analysis of quality management in teacher education, focusing on publications from the past 20 years. This review, aims to address the following research questions: (1) What is the publication productivity trend in the field of quality management in teacher education over the past 20 years?; (2) Who are the most influential authors in the field?; (3) Which authors and countries are most strongly bibliographically coupled?; and (4) What thematic clusters and research fronts have emerged over time?


## 2. METHOD

### Research Design

This paper employs scientometric or bibliometric analysis-- a quantitative research method used to examine patterns within academic literature, enabling scholars to map the intellectual structure and evolution of a field. By systematically analyzing publication data—such as citations, authorship, and keyword usage—bibliometric techniques provide insights into research productivity, scholarly influence, and thematic development over time (Donthu et al., 2021). Unlike traditional narrative reviews, bibliometric analysis offers objectivity and scalability, making it particularly useful for synthesizing large bodies of literature across multiple disciplines. Common bibliometric techniques include citation analysis, co-authorship mapping, co-citation analysis, and keyword co-occurrence analysis. These methods help identify leading contributors, research clusters, and collaborative networks. In the context of teacher education and quality management, bibliometric analysis can reveal how quality assurance frameworks have been conceptualized, adopted, and debated globally. Furthermore, it can highlight emerging themes such as accountability, accreditation, and the role of international standards in shaping teacher education reform.


### Data Source

Bibliographic analysis requires reliable data sources (Aria & Cuccurullo, 2017). Since Scopus, developed by Elsevier, is one of the most widely used sources of scholarly works, the Scopus database was utilized to retrieve bibliographic data for all relevant studies published over the past two decades (2004-2024).


### Data Extraction

A carefully constructed set of keywords ensured the comprehensive identification of literature related to teacher education and quality management. The following search string was employed to maximize relevance and coverage: TITLE-ABS-KEY("teacher education" OR "teacher training") AND TITLE-ABS-KEY("quality assurance" OR "quality management" OR "educational standards" OR "best practices" OR compliance) AND TITLE-ABS-KEY("higher education" OR "tertiary education" OR university) AND PUBYEAR > 2004. This search strategy yielded a dataset that forms the foundation for the bibliometric analysis, enabling the quantitative assessment of scholarly outputs, trends, and research patterns within the field (Rejeb et al., 2023). The bibliographic data were obtained from Scopus on May 29, 2024. ("teacher education" OR "teacher training") AND ("quality assurance" OR "

**Data Analysis**

A range of bibliometric indicators and analytical techniques was employed to examine the collected data. These included citation analysis, co-authorship analysis, keyword co-occurrence analysis, and publication trend analysis, among others. Together, these methods provided comprehensive insights into citation patterns, collaboration networks, dominant research themes, and the temporal evolution of the field. To enhance the visualization and interpretation of the results, VOSviewer was used for bibliometric mapping (Abbas et al., 2022; Hamidah et al., 2020). These tools facilitated the identification of major thematic clusters, prominent authors, and emerging trends, thereby supporting a deeper understanding of the intellectual structure and dynamics of the literature. Figure 1 shows the steps in bibliometric analysis.
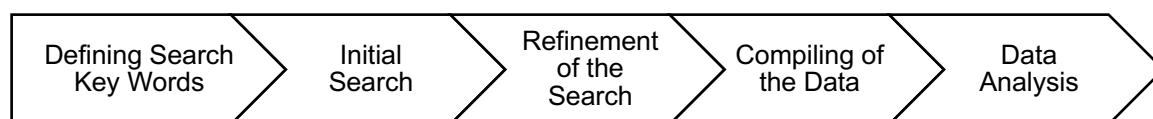
| Defining Search Key Words | Initial Search | Refinement of the Search | Compiling of the Data | Data Analysis |

*Figure 1. Steps in Bibliometric Analysis*

## 3. RESULT AND DISCUSSION

This section presents the results of the bibliometric analysis covering 130 articles obtained from the Scopus Database published from 2004-2024.

**Trends of Publication Productivity from 2004-2024**

Figure 2 shows the trends of publication productivity on quality management in teacher education within the past two decades. Overall, the data reveal a declining trend in scholarly output on quality management in teacher education. This suggests a disjunction between the recognized global priority of quality education—central to the 17 Sustainable Development Goals (SDGs)—and the actual volume of academic research supporting it. Despite sustained efforts by the United Nations Educational, Scientific and Cultural Organization (UNESCO) to promote inclusive, equitable, and high-quality education, scholarly engagement in this domain remains disproportionately low.
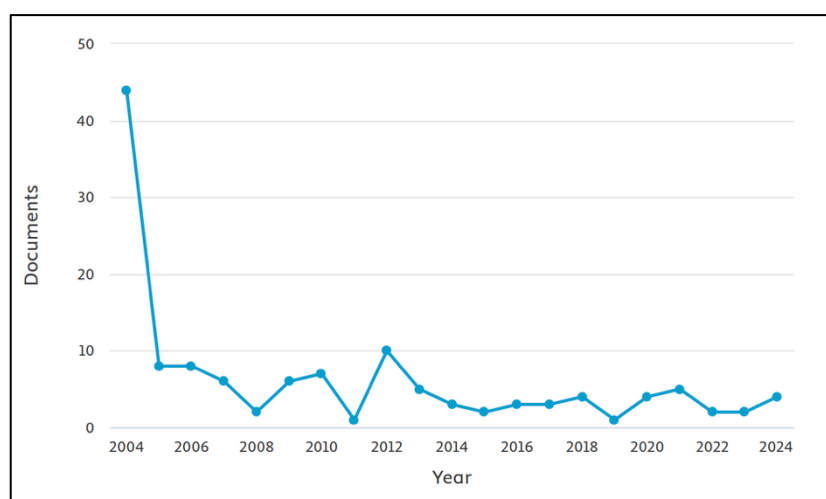


*Figure 2. Publication productivity trends on quality management in teacher education from 2004-2024*

**Most Cited Authors in Quality Management in Teacher Education**

Figure 3 shows the heat map generated by VOSviewer displaying clusters of authors who are frequently cited in the literature. Several prominent authors emerge as central nodes in the co-citation network, suggesting their significant influence in shaping the discourse on quality in teacher education. Loughran (2005) is positioned centrally, reflecting his foundational work on teacher professional learning, reflective practice, and teacher educator identity. His contributions align with international discourse on teacher education reform and the development of quality frameworks (Loughran, 2006).

Butler (2004) and Luft (2004) also appear as major nodes. Butler's work often focuses on professional development and collaborative inquiry, while Luft's scholarship addresses science teacher education and mentorship, both of which are central to discussions of quality improvement in teacher preparation programs (Luft & Hewson, 2014). Koster (2005) and Settlage (2009) contribute to the literature on teacher standards, assessment, and accountability—core themes in quality assurance mechanisms globally (Flores, 2012). These authors represent theoretical anchors in the bibliometric landscape, forming a scholarly foundation upon which contemporary studies continue to build.
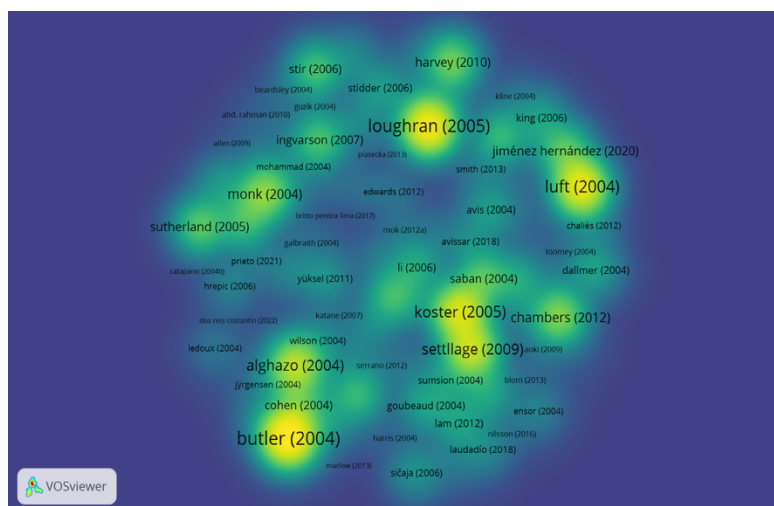


*Figure 3. Density of most influential authors in quality management in teacher education*

Figure 4 shows the density visualization of co-authorship network. This network, maps the relationships and collaboration intensity among various scholars in this domain. Amanda Berry stands out as a central figure in this network, situated in the most intense (bright yellow) region. Her prominence suggests extensive collaboration and influence in research related to teacher education and quality management. Other notable authors such as Emad M. Alghazo, Marco Túlio de Urzêda Freitas, Janice Monk, and Dianne J. Chambers appear in moderately dense clusters, suggesting active engagement but with varying levels of centrality. Authors like Karleen Goubeaud, John Stir, and Malachy Bishop appear in peripheral yet discernible subclusters, indicating the presence of smaller, perhaps more specialized, collaborative groups. This spatial distribution of names implies thematic or regional clustering. For example, the proximity of Emad Alghazo, Janice Monk, and Marco Túlio de Urzêda Freitas hints at a cohesive research community, likely focusing on similar quality frameworks or geographic education systems. Peripheral clusters, such as those involving Julianne Moss or Alan McCully, suggest either emerging contributors or niche areas that haven't yet integrated fully into the broader discourse.
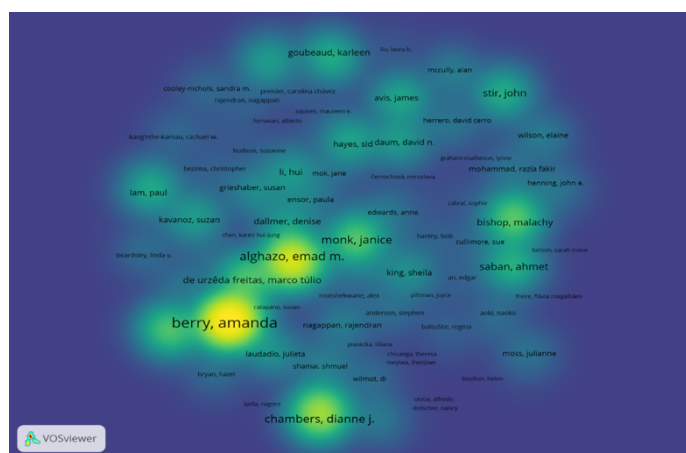


*Figure 4. Density of co-authorship network of quality management in teacher education*

Figure 5 presents a co-citation map displaying nodes representing individual publications, with edges signifying the frequency of co-citation. In the red cluster, studies on foundational pedagogical

frameworks comprise the core, with Butler (2004) and Settlage (2009) forming the nucleus, representing foundational research on reflective practice, teacher identity, and inquiry-based approaches to professional development. Luft (2004) and Ingersoll (2007) are significant co-cited works in this cluster, often addressing systemic teacher quality issues, especially in Science, Technology, Engineering and Mathematics (STEM) education. This cluster reflects a strong emphasis on teacher development as a quality assurance mechanism, aligning with literature that ties teacher autonomy and professional identity to educational effectiveness (Day, 2002; Kelchtermans, 2009).
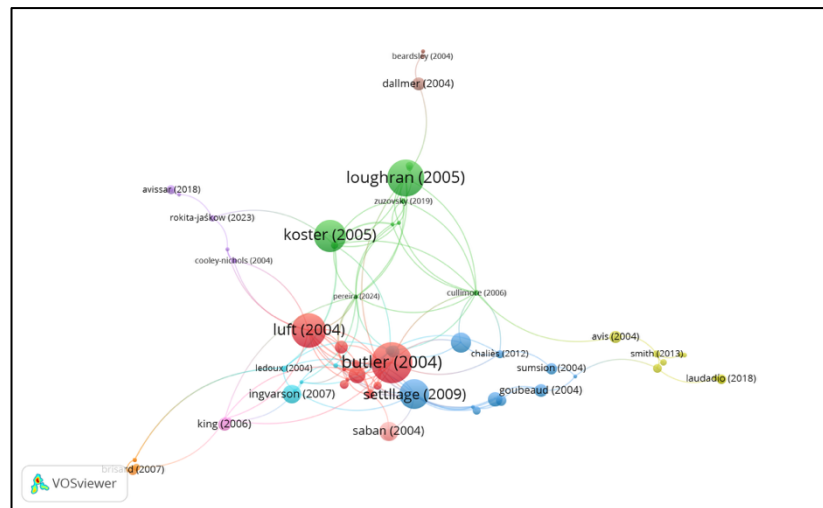


*Figure 5. Network of most strongly bibliographically coupled authors in the field of quality management in teacher education*

In the green cluster, Loughran (2005) and Koster (2005) dominate, showing tight interconnectedness and focus on mentor-mentee relationships, reflective practice, and professional learning communities. This body of work supports the view that sustainable quality in teacher education stems from mentorship models and collaborative learning environments (Loughran, 2002; Zeichner, 2010). The visibility and centrality of these authors underscore their theoretical influence on shaping teacher preparation models. Under the blue cluster, Saban (2004), Goe (2004), and Sundli (2007) are at the core. They focused on frameworks for evaluating teacher performance, quality indicators, and policy-level interventions. This is consistent with external pressure in education systems to standardize and measure quality (Organization for Economic Co-operation and Development [OECD], 2013), which contrasts with the red and green clusters' more developmental and reflective orientations. Yellow cluster presents emerging and peripheral research on quality management in teacher education. This cluster includes more recent or less frequently co-cited works such as Smith (2013) and Laudadio (2018). These are likely newer contributions or from niche perspectives. Their peripheral position suggests emergent lines of inquiry, potentially focusing on technological integration, inclusive education, or cross-cultural teacher education, areas identified in recent literature as gaining traction (Darling-Hammond, 2017). Lastly, the pink cluster reveals authors who focused on teacher autonomy and curriculum reform. This smaller but distinct cluster features King (2006) and Avissar (2018), possibly tied to themes around teacher agency, curriculum adaptation, and equity in education. These works may serve as critical counterpoints to dominant quality discourses that overemphasize standardization.

### Most Cited Countries in Quality Management in Teacher Education

Figure 6 reveals the VOSviewer visualization of country co-authorship network in the domain of quality management in teacher education. United States is the most central and well-connected node in the network. It shares strong co-authorship ties with the United Kingdom, Australia, and South Africa. United Kingdom is another highly collaborative hub, maintaining robust links with both Western and non-Western countries, including Malaysia and the Netherlands. Australia also features prominently, bridging connections between the Anglo-American core and Hong Kong. These three countries form the triad of global leadership in teacher education research, particularly in discussions of quality assurance, accountability, and teacher professionalism. South Africa and Malaysia emerge as key regional contributors from the Global South and Southeast Asia, respectively. While not as central, their multiple links to dominant hubs indicate growing participation and knowledge production. Netherlands is moderately connected, reflecting its historical emphasis on reflective teaching and competency-based

teacher education. Hong Kong**,** although on the periphery, links with Australia and the United Kingdom, representing Asia's specialized engagement in the discourse, often focusing on policy reforms and teacher performance frameworks. Iran and Poland appear in more isolated clusters, with weaker international collaboration, especially with the Anglo-American bloc. This may indicate either language barriers, limited funding, or nationally confined research agendas. Despite isolation, these countries may still be producing contextually rich or critical perspectives that challenge dominant Western paradigms in quality management.
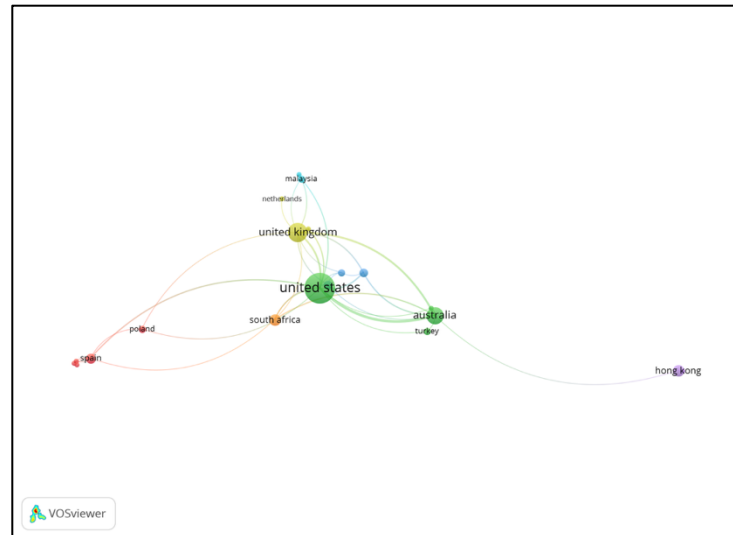


*Figure 6. Network of countries exhibiting the strongest bibliographic coupling in the field of quality assurance in teacher education*

### Most Referenced Thematic Clusters and Research Fronts
The keyword co-occurrence network in Figure 7 reveals a rich thematic landscape in the domain of educational research, particularly around the concept of "teaching", which emerges as the central node. At the central cluster (grey/yellow) lies the keyword "teaching", which is prominently connected to terms such as curricula, teacher education, and personnel training. This centrality indicates that teaching acts as the fulcrum around which other educational themes revolve, affirming its foundational role in shaping pedagogical practices and educational outcomes. The red cluster highlights key terms like students, behavioral disorder, inclusive education, and motivation. This thematic grouping underscores an increasing research focus on student-centered pedagogies**,** behavioral management, and inclusive practices**,** aligning with global trends emphasizing equity and inclusion (Ainscow & Miles, 2008). The green cluster includes higher education, professional development**,** and teacher identity**,** pointing to ongoing scholarly interest in teacher professionalism**,** lifelong learning, and the evolving roles of educators in tertiary settings. This aligns with Darling-Hammond's (2006) emphasis on sustained teacher learning as a driver of improved educational outcomes. Terms such as e-learning**,** online education, and initial teacher education populate in the blue cluster, reflecting the digitization of education and the adaptation of teacher training programs to incorporate technological tools. This trend has been accelerated by the COVID-19 pandemic and is consistent with findings by Trust & Whalen (2020) on the rapid shift to remote teaching. In the purple cluster geographical markers like Eastern Europe and themes like collaboration and community suggest an emergent interest in comparative education studies and cross-national collaborations, particularly in the post-socialist contexts where educational reforms are rapidly evolving. Lastly, the brown cluster reflects research intersections between physical education**,** chronotype**,** and pre-service teacher education**,** suggesting niche but growing interest in how lifestyle factors and initial training affect teaching efficacy.
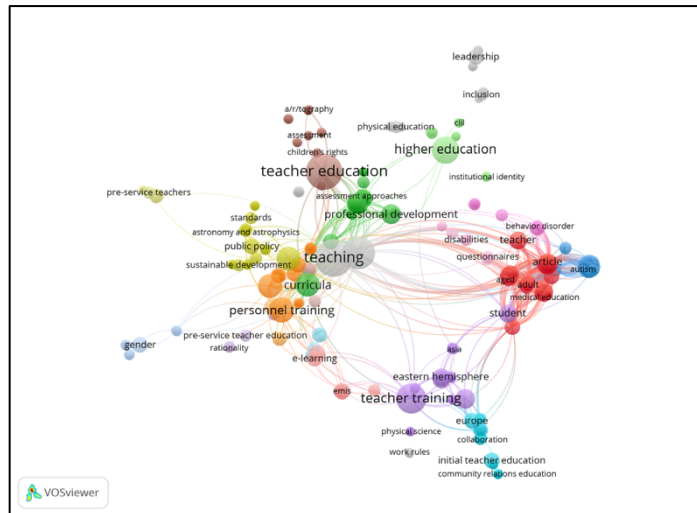
*Figure 7. Network of most frequent keywords authors use in the field of quality management in teacher education*

## Discussion

The bibliometric mapping of literature on quality management in teacher education reveals a rich, evolving field characterized by both global consensus and emerging thematic divergence. The data on publication trend show a pronounced spike in 2004, where over 40 documents were published. This initial surge may reflect a mass indexing of foundational studies or increased scholarly attention following early policy shifts in teacher education reform. However, this momentum was not sustained. Following 2004, the annual number of publications sharply declined and stabilized at a significantly lower range—typically between 2 and 10 documents per year—demonstrating inconsistent scholarly engagement over the subsequent two decades. This pattern is concerning given the centrality of quality education in global policy frameworks such as the United Nations Sustainable Development Goal 4 (SDG 4), which emphasizes the need for inclusive and equitable quality education and the promotion of lifelong learning opportunities (UNESCO, 2016). Despite the global urgency to improve teacher preparation, the field's publication trajectory suggests a disconnect between policy priorities and academic discourse. Similar concerns have been raised by Sahlberg (2011) and Darling-Hammond (2006), who argue that systemic reform in teacher education requires sustained scholarly inquiry to inform and evaluate practice. Although modest peaks are observable in 2010, 2012, and again in 2021, these appear episodic rather than indicative of a long-term upward trend. The slight resurgence in 2021 may be linked to the pedagogical disruptions caused by the COVID-19 pandemic, which reinvigorated academic interest in educational quality and resilience (Trust & Whalen, 2020; Abbas et al., 2022). However, this renewed attention was not sufficient to catalyze a consistent increase in scholarly output, highlighting the need for more responsive and agile research mechanisms that can capture and inform evolving educational realities in real time. The generally stagnant publication rate over the last two decades also suggests that research in quality management within teacher education has not kept pace with global developments such as digital transformation, inclusive pedagogies, and the growing emphasis on reflective practice and professional identity (Loughran, 2005; Zeichner, 2010). Furthermore, this trend may reflect a geographic concentration of research efforts in a few high-income countries, with limited representation from developing contexts where challenges in teacher education quality are most acute (Al-Samarrai et al., 2023). Without more inclusive international engagement, the field risks perpetuating a narrow epistemic base that overlooks diverse educational systems and cultural contexts (Ball, 2003; Sayed & Motala, 2012). In light of these findings, there is a compelling need to reenergize scholarly inquiry into quality management in teacher education. Research agendas must be broadened to include underrepresented regions, promote interdisciplinary approaches, and establish stronger links between empirical research and policy implementation. Enhancing global collaboration and investing in capacity-building initiatives will be critical to developing evidence-informed frameworks that support teacher preparation systems worldwide.

The heat map of most-cited authors highlights the foundational influence of scholars such as Loughran (2005), Butler (2004), and Luft (2004), whose work has shaped the contours of reflective practice, collaborative inquiry, and subject-specific teacher development. Loughran's emphasis on professional learning and teacher educator identity has been particularly influential, aligning with international trends that prioritize reflective competence and identity construction as critical indicators of teacher education quality. These intellectual anchors suggest a globally shared understanding that quality in teacher education extends beyond metrics and inputs to encompass the lived experiences of educators and learners. The prominence of reflective practice and inquiry-based learning underscores a shift from prescriptive to developmental approaches in ensuring teacher effectiveness. Such orientation is consistent with global quality assurance frameworks (e.g., OECD, 2013; Flores, 2012), which stress the importance of sustained professional development and contextual adaptability. The co-authorship network further illustrates the structural dynamics of knowledge production within the field. Central figures such as Amanda Berry demonstrate strong collaborative ties, functioning as hubs of scholarly activity and thematic leadership. However, the presence of numerous peripheral nodes suggests a relatively fragmented research community, where knowledge production remains uneven and often siloed. This configuration reflects similar patterns in broader educational research (Zhao & Liu, 2020), where a small number of scholars and institutions disproportionately shape the research agenda. These findings underscore critical global implications for the evolution of quality management in teacher education. The visible concentration of research leadership in a few dominant regions highlights persistent asymmetries in global knowledge production. This centralization calls for more inclusive international research ecosystems that actively engage underrepresented regions and institutions. To achieve meaningful progress, teacher education systems worldwide must move beyond passive adoption of dominant paradigms and instead participate in mutual knowledge exchange that respects contextual diversity while aligning with internationally recognized quality standards.

The prominence of frameworks such as Loughran's reflective practice model signals a need for globally informed yet locally adaptable quality assurance systems. As countries seek to improve teacher education outcomes, integrating such evidence-based paradigms can elevate policy coherence and institutional effectiveness. Additionally, the fragmentation observed in global co-authorship networks reveals a structural challenge: a lack of equitable research collaboration across regions. Addressing this fragmentation requires international policy and funding mechanisms that promote capacity building, South–South cooperation, and cross-border institutional partnerships, ensuring that innovation in teacher education is both geographically diverse and contextually grounded.

The co-citation clusters identified in the analysis offer further insight into the theoretical underpinnings of the field. The red cluster, comprising scholars like Butler, Settlage, and Ingersoll, focuses on reflective practice and professional identity. The green cluster, with central figures such as Loughran and Koster, emphasizes mentorship and learning communities. Meanwhile, the blue cluster foregrounds accountability and evaluation, and the yellow and pink clusters represent emergent areas, including inclusive education, digitalization, autonomy, and curriculum reform. These clusters reflect an ongoing negotiation between competing imperatives: the need for standardized measures of quality, and the recognition of professional agency and contextual specificity. While accountability remains a dominant narrative in global policy (e.g., OECD, 2013), scholars such as Zeichner (2010) and Day (2002) advocate for a more nuanced understanding that places teacher autonomy, identity, and moral purpose at the center of educational reform. Such discourse is highly relevant to the Philippine education system, where quality assurance mechanisms often prioritize compliance and quantifiable indicators, potentially at the expense of teacher agency and developmental growth.

The geopolitical distribution of co-authorship further reinforces these dynamics. The dominance of countries such as the United States, United Kingdom, and Australia in the global collaboration network suggests a persistent asymmetry in knowledge production and dissemination. Emerging contributors from countries like South Africa, Malaysia, and the Netherlands signal a gradual diversification, but the relative absence of Southeast Asian nations—including the Philippines—from these networks is notable. This gap underscores the importance of internationalization strategies that go beyond publication incentives to include structured collaboration, joint research grants, and participation in transnational research consortia.

Keyword co-occurrence analysis reveals the thematic breadth of the field. The centrality of "teaching" as a keyword anchors the discourse, while clusters related to inclusive education, teacher motivation, professional identity, and digitalization highlight the field's responsiveness to contemporary educational challenges. The growing emphasis on e-learning and technology-enhanced instruction, in particular, reflects a paradigmatic shift in initial teacher education and continuing professional development, especially in the wake of COVID-19 disruptions.

In sum, the bibliometric landscape of quality management in teacher education reveals a field that is both theoretically robust and pragmatically dynamic. The global co-authorship and collaboration networks highlight a concentration of influence among a few dominant regions, while also signaling emerging contributions from historically underrepresented contexts. These findings carry significant implications for countries across all development spectra. Nations seeking to enhance the quality of their teacher education systems can use this map not only as a reflection of current global research dynamics but also as a strategic framework for future engagement. Aligning national reforms with internationally recognized best practices must go hand-in-hand with the localization of quality frameworks—ensuring they are responsive to specific cultural, institutional, and professional realities. For countries aiming to increase their scholarly visibility and impact, the path forward lies in both amplifying indigenous perspectives and actively participating in transnational research dialogues**.** Future research should explore the positioning of scholars and institutions from these regions within global co-authorship networks, and critically assess the extent to which national education policies reflect or diverge from global quality assurance trends. Ultimately, building collaborative ecosystems that foster both local relevance and global resonance will be key to ensuring that improvements in teacher education quality are meaningful, inclusive, and sustainable across diverse educational landscapes.

## 4. CONCLUSION

This bibliometric analysis of quality management in teacher education identifies key intellectual and collaborative structures shaping the field. This bibliometric analysis has shown a concerning disparity between policy efforts and academic discourse in quality management in teacher education. Loughran, Butler, and Luft were identified as key thought leaders in the field of quality management in teacher education, with significant contributions to reflective practice, teacher identity, and professional learning. Amanda Berry's central position in the co-authorship network highlights the role of collaborative scholarship in advancing the discourse on teacher quality. The United States, United Kingdom, and Australia lead in bibliographic coupling, indicating their central influence in global research. However, increased engagement from countries such as South Africa, Malaysia, and the Netherlands points to a growing diversification of knowledge production, which is essential for addressing educational challenges in varied contexts. Thematic clusters reveal five dominant research fronts: reflective and collaborative practice, mentorship and learning communities, accountability and quality assurance, inclusive education, and digital innovation. These areas reflect a global shift toward more holistic and adaptive approaches to teacher education. Aligned with Sustainable Development Goal 4 (SDG 4)**—** which promotes inclusive, equitable, and quality education for all—the findings underscore the need for strengthened international collaboration, capacity-building for emerging research contexts, and a balanced focus on both measurable outcomes and developmental approaches. Future research should prioritize equity, technological integration, and sustainability in teacher education systems to support the global agenda for lifelong learning and quality teaching.

## 5. ACKNOWLEDGE

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