Teacher Effectiveness Research from Margins to Mainstream: A Bibliometric Mapping of Eight Decades of Educational Leadership and Practice

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Abstract
Teacher effectiveness has long been recognised as a key determinant of educational quality. However, rapid transformations in education systems driven by globalisation and digitalisation have led to substantial growth. Despite this expansion, systematic mapping of the trends remains limited. To address this gap, this study adopts a bibliometric approach to synthesise and visualise the evolution of teacher effectiveness research. Data were retrieved from the Scopus database using an advanced search strategy, resulting in a final dataset of 1,286 peer-reviewed journal articles. Scopus Analyzer was used to examine publication trends, citation patterns, and geographical distribution, while OpenRefine was utilized for data cleaning. VOSviewer was then employed to generate visualisations of keyword co-occurrence and international co-authorship networks. The findings indicate a sustained increase in publications from the early 2010s onwards, reflecting heightened scholarly attention to teacher effectiveness. The United States, United Kingdom, and Australia emerge as leading contributors, alongside growing participation from Asia and the Middle East, signalling the field's globalisation. Keyword analysis identifies professional development, teacher education, self-efficacy, and instructional quality as dominant themes, with emerging digital-related concepts. Overall, the study offers a systematic overview of the knowledge structure and research dynamics of teacher effectiveness, providing insights to inform future research and policy directions.
Keywords: teacher effectiveness, teacher quality, professional development, bibliometric analysis, VOSviewer

Introduction

In the digital era, teacher effectiveness has emerged as a fundamental concern. The reality is that educational institutions increasingly integrate technology within learning environments (Bentri et al., 2025). The acceleration of digital transformation has redefined traditional teaching models and prompted an exploration of how digital tools, online platforms, and innovative pedagogical approaches can enhance teaching practices (Liu et al., 2025). Recent studies have highlighted that teacher digital competence, including the integration of technology with pedagogical knowledge and content expertise, is critical for improving instructional quality and student outcomes (Roberts et al., 2020). As educators navigate the complexities of digital classrooms, institutions are tasked with providing not only technical training but also supportive frameworks that foster self-efficacy and resilience (Zhou et al., 2023). In this context, effective teacher development is seen as both a process of acquiring new skills and a continuous transformation that adapts to rapidly evolving digital landscapes.

The evolution of teacher effectiveness in digital environments underscores the necessity for a reconsidered educational paradigm (Roberts et al., 2020). Emerging research points to the interplay between professional development, digital literacy, and adaptive teaching methodologies in shaping educator performance. Evidence suggests that when teachers receive targeted professional development that encompasses both technical skills and reflective practice, they are better positioned to meet the challenges of a digital classroom (Zhou et al., 2023). Furthermore, initiatives that embrace innovative digital pedagogy and collaborative learning communities have been shown to enhance teacher motivation and lower burnout rates, thereby contributing to more effective teaching practices (Gonçalves et al., 2026). Against a backdrop of increasing digitalization and global challenges, the quest for optimizing teacher effectiveness is both timely and essential for ensuring educational equity and fostering learner engagement in diverse academic settings (Gonçalves et al., 2026; Razukhan et al., 2025).

This study aims to examine the trend in studies since the first study on teacher effectiveness. By observing these trends, further studies on teacher effectiveness can be conducted by incorporating additional antecedent factors. Therefore, this study is expected to make a significant contribution in the field of education in the future.

Literature Review

Recent literature on teacher effectiveness in the digital era offers a multifaceted perspective on the integration of digital tools with pedagogical practices (Bentri et al., 2025; Liu et al., 2025). Studies assert that digital competence is not merely about technical proficiency but also relates to a teacher's ability to effectively merge content knowledge with innovative teaching strategies. Frameworks such as TPACK have been widely adopted to examine how digital and pedagogical knowledge interact to enhance student learning (Gonçalves et al., 2026). Researchers have demonstrated that when teachers are equipped with both robust digital skills and sound pedagogical principles, there is a marked improvement in instructional quality and student engagement (Bentri et al., 2025; Gonçalves et al., 2026; Liu et al., 2025). Several scholars argue that continuous professional development plays an instrumental role in bolstering these competencies, leading to reduced teacher burnout and increased instructional efficacy (Bentri et al., 2025; Liu et al., 2025; Roberts et al., 2020; Zhou et al., 2023).

Additionally, investigations into professional development programs have underscored the significance of collaborative learning and peer support in cultivating teacher self-efficacy (Roberts et al., 2020; Zhou et al., 2023). Empirical evidence indicates that well-structured digital training initiatives, incorporating reflective practices and technological hands-on sessions, have a positive impact on educators' confidence and classroom management skills (Gonçalves et al., 2026). These programs often focus on practical applications and adaptive strategies that allow teachers to meet the dynamic challenges of digital teaching (Razukhan et al., 2025). Some studies also identify the need for customized training models tailored to diverse educational contexts, highlighting that a one-size-fits-all approach may not be effective across different regions or educational levels (Gonçalves et al., 2026; Razukhan et al., 2025).

Further exploration within the literature reveals compelling insights into the role of institutional support in shaping digital competence. Administrative backing, high-quality digital infrastructure, and clear policy frameworks are frequently cited as essential ingredients for cultivating an environment conducive to digital innovation. Numerous studies demonstrate that teachers working within supportive institutional contexts are more likely to adopt innovative pedagogical methods and integrate technology effectively into their teaching practices (Estaji et al., 2024; Munk et al., 2025; Zhou et al., 2023). Moreover, such environments foster sustained engagement and promote ongoing professional growth, enabling educators to navigate challenges such as limited resources or technological reluctance (Bentri et al., 2025; Estaji et al., 2024; Gonçalves et al., 2026; Liu et al., 2025; Luo et al., 2025; Munk et al., 2025; Ozan & Özarslan, 2025; Razukhan et al., 2025).

Lastly, emerging trends in digital assessment literacy and the application of artificial intelligence in education are beginning to influence teacher effectiveness. Although current research is still evolving, several studies point to a growing need for frameworks that address how digital tools can be effectively incorporated into assessment practices (Banitalebi et al., 2025; Estaji et al., 2024; Luo et al., 2025; Munk et al., 2025). These challenges and opportunities call for further investigation into standardized methodologies and longitudinal studies to better differentiate technological proficiency from pedagogical innovation. Collectively, the literature underscores that the future of teacher

effectiveness depends on multifaceted strategies that integrate digital competence, continuous professional development, and strong institutional support (Banitalebi et al., 2025; Estaji et al., 2024; Luo et al., 2025; Munk et al., 2025).

Research Question

RQ1. What are the temporal publication trends and growth patterns in research on teacher effectiveness over time?

RQ2. Who are the most prolific authors contributing to the literature on teacher effectiveness, and how is their scholarly productivity distributed?

RQ3. Which publications constitute the most influential works in the field of teacher effectiveness, as indicated by citation impact?

RQ4. Which countries are the leading contributors to research on teacher effectiveness in terms of publication output and citation impact?

RQ5. What are the dominant and emerging research themes in the field of teacher effectiveness, as reflected through keyword co-occurrence analysis?

RQ6. How do international co-authorship networks shape scholarly collaboration in teacher effectiveness research across countries?

Methodology

This study adopted a bibliometric approach to systematically examine scholarly work on teacher effectiveness in the digital era. Bibliometrics enables the structured collection, organization, and analysis of publication data, allowing researchers to map patterns, trends, and intellectual structures within a research field (Alves et al., 2021; Assyakur & Rosa, 2022; Verbeek et al., 2002). Beyond descriptive indicators such as publication outlets, publication years, and influential authors the analysis also employed advanced techniques, including document co-citation analysis, to capture deeper conceptual linkages across studies (Wu & Wu, 2017).

The review process followed an iterative and reflective procedure, beginning with the careful refinement of keywords, followed by comprehensive database searching and detailed analytical screening. This stepwise approach was essential for constructing a coherent and reliable bibliographic corpus (Fahimnia et al., 2015). In line with the study's objective to understand the theoretical foundations of the field, priority was given to high-impact publications that offer substantive conceptual and empirical contributions.

To ensure consistency and data reliability, SCOPUS was selected as the primary database, given its rigorous indexing standards and extensive coverage of high-quality journals (Al-Khoury et al., 2022; Di Stefano et al., 2010; Khiste & Paithankar, 2017). Only peer-reviewed journal articles were included to maintain academic rigor, while books and lecture materials were intentionally excluded (Gu et al., 2019). The data were retrieved from the Scopus database in January 2026. While the search results included publications indexed up to early 2026, the analysis was limited to publications from 1940 to 31 December 2025 to ensure completeness and avoid bias due to indexing delays.

Data Analysis

The bibliometric analysis in this study was conducted using VOSviewer, a widely recognised and user-oriented software developed by Nees Jan van Eck and Ludo Waltman at Leiden University, the Netherlands (van Eck & Waltman, 2010, 2017). VOSviewer is extensively applied in bibliometric research to visualise and analyse scientific literature through network-based representations. The software is particularly effective in constructing network visualisations, identifying clusters of related items, and producing density maps that reveal the intellectual structure of a research field. Its functionality supports the analysis of co-authorship, co-citation, and keyword co-occurrence networks, thereby enabling a comprehensive exploration of research patterns and thematic developments. The interactive design and regular updates further facilitate efficient handling and interpretation of large bibliographic datasets.

A key strength of VOSviewer lies in its ability to convert complex bibliometric data into visually accessible maps and graphical representations. By emphasising network visualisation, the software allows researchers to identify relationships among publications, authors, and keywords through clustering and co-occurrence analysis. Its intuitive interface supports both novice and experienced users in navigating research landscapes systematically. Continuous refinement of the software ensures its relevance in contemporary bibliometric studies, offering flexible options for metric computation and visual customisation. Moreover, its compatibility with multiple bibliographic data formats reinforces its value as a robust analytical tool for examining complex and evolving research domains.

For this study, bibliographic datasets containing information on publication year, article title, authorship, journal source, citation counts, and keywords were retrieved from the Scopus database in January 2026. The dataset comprised publications indexed between 1940 and 31 December 2025, ensuring a complete longitudinal analysis across more than eight decades of research development. These datasets were subsequently analysed using VOSviewer version 1.6.19. Full counting was applied to ensure equal weight was assigned to each occurrence of authors, keywords, and documents in the network analysis. The software's clustering and mapping techniques were employed to generate visual representations of the data. As an alternative to the Multidimensional Scaling (MDS) approach, VOSviewer positions items within a low-dimensional space such that the distance between any two items reflects the strength of their relatedness (van Eck & Waltman, 2010). While this approach shares conceptual similarities with MDS (Appio et al., 2014), it differs in its methodological foundation. Unlike MDS, which typically relies on similarity measures such as cosine similarity or the Jaccard index, the VOS approach applies a more appropriate normalization technique for co-occurrence data, namely association strength (AS_{ij}) (van Eck & Waltman, 2007). Association strength is calculated as follows:

$$AS_{ij} = \frac{C_{ij}}{w_i w_j}$$

which C_{ij} represents the number of co-occurrences between items i and j, and w_i and w_j denote the total occurrences of items i and j, respectively (van Eck & Waltman, 2007).

Data Search Strategy

The data retrieval process for this bibliometric study was conducted using the Scopus database through an advanced search strategy designed to ensure both relevance and disciplinary focus. The search covered all years available in the Scopus database for the selected query, spanning from 1940 to December 2025, representing the full historical development of teacher effectiveness research. The search string TITLE (Teacher effectiveness) AND (LIMIT-TO (LANGUAGE , "English")) AND (LIMIT-TO (SUBJAREA , "SOCI")) was applied to capture publications in which teacher effectiveness constitutes the central analytical focus, rather than a peripheral concept. To maintain linguistic consistency and analytical coherence, the search was limited to English-language publications. In addition, the subject area filter SOCI (Social Sciences) was applied to align the dataset with educational, organisational, and socio-pedagogical perspectives, which are most relevant for examining teacher effectiveness within digitally transforming educational systems. This structured filtering strategy was intended to balance breadth and precision, ensuring that the retrieved literature meaningfully reflects scholarly discourse in education and related social science fields.

Following the application of these criteria, a final dataset of 1,286 publications was obtained and deemed suitable for bibliometric analysis. This volume indicates sustained and growing scholarly attention to teacher effectiveness as a core issue within contemporary educational

research. The dataset provides a robust foundation for mapping publication trends, identifying influential authors and journals, and examining thematic evolution related to digitalisation, pedagogy, and professional practice. By restricting the dataset to high-quality, peer-reviewed Scopus-indexed sources, the study ensures analytical rigor while enabling a comprehensive exploration of the intellectual structure and research trajectories shaping the field of teacher effectiveness in the digital era.

Result and Discussion

RQ1. What are the temporal publication trends and growth patterns in research on teacher effectiveness over time?
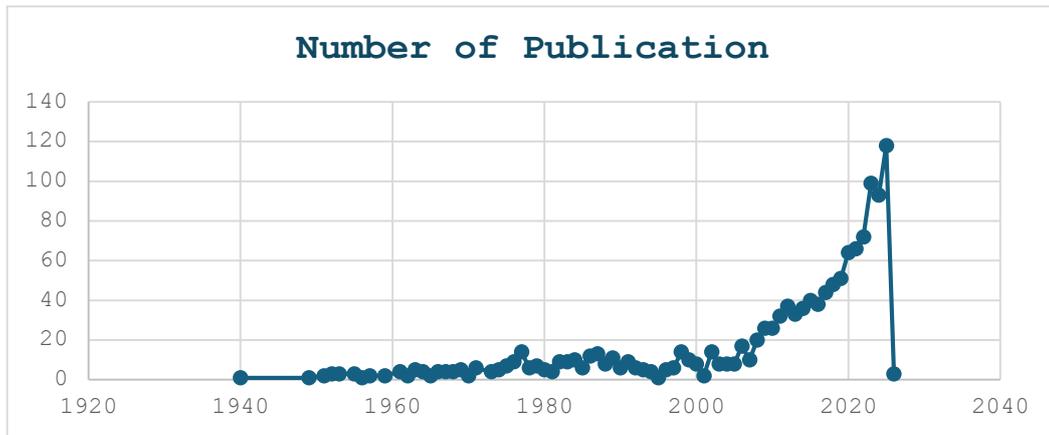

Figure 1: Trend of research in teacher effectiveness by years

The longitudinal distribution of publications indicates that research on teacher effectiveness began in the early 1940s but remained marginal for several decades. From 1940 to the late 1970s, annual publication counts were extremely low, often fewer than five studies per year, suggesting that teacher effectiveness was treated as a peripheral or emerging concern, largely embedded within broader discussions of pedagogy, classroom management, and educational psychology. A modest increase is observable from the 1980s through the early 2000s, marked by fluctuations rather than steady growth. This period corresponds with the rise of school effectiveness research, accountability movements, and early educational reforms, where teacher effectiveness began to be operationalised more systematically but was still largely examined through traditional, non-digital lenses.

A pronounced and sustained growth trend emerges from approximately 2010 onwards, signalling a structural shift in the research landscape. Publication counts rise sharply from fewer than 30 studies per year in 2010 to over 60 by 2020, peaking between 2021 and 2023 with more than 90 publications annually. This surge reflects intensified scholarly attention driven by rapid digitalisation, widespread adoption of educational technologies, and the pedagogical disruptions caused by the COVID-19 pandemic, which foregrounded teacher effectiveness in digitally mediated teaching environments. The apparent fluctuation in the most recent period should be interpreted cautiously due to indexing delays. Overall, the trend demonstrates a clear transition from slow conceptual development toward a mature and rapidly expanding body of research, underscoring teacher effectiveness as a central construct in understanding educational quality in the digital era. The analysis included publications up to 2025, which represents the most recent complete year available at the time of data retrieval.

RQ2. Who are the most prolific authors contributing to the literature on teacher effectiveness, and how is their scholarly productivity distributed?
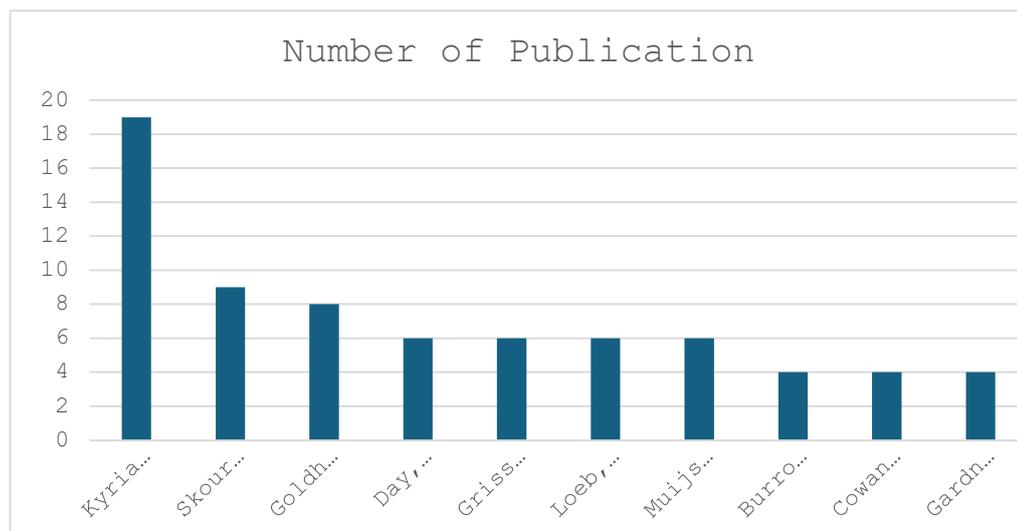

Figure 2: Trend of research in teacher effectiveness by the top authors

Table 1: The most prolific authors contributing to the literature on teacher effectiveness.

No.	Author Name	Number of Publication
1	Kyriakides, L.	19
2	Skourdoumbis, A.	9
3	Goldhaber, D.	8
4	Day, C.	6

5	Grissom, J.A.	6
6	Loeb, S.	6
7	Muijs, D.	6
8	Burroughs, N.	4
9	Cowan, J.	4
10	Gardner, J.	4

The distribution of publications among the top ten authors indicates a relatively concentrated pattern of scholarly contribution within the field of teacher effectiveness. Kyriakides leads decisively with 19 publications, highlighting his sustained and influential engagement with effectiveness research, particularly in relation to school improvement, teacher quality, and evidence-based instructional models. This is followed by Skourdoumbis (9) and Goldhaber (8), whose work often intersects with policy analysis, teacher evaluation, and labour-market perspectives on teaching effectiveness. The presence of authors who contributed some publications reflects the field's interdisciplinary nature, blending perspectives from professional development, leadership, educational effectiveness research, and policy-driven accountability frameworks (Bardach et al., 2022; Grissom & Loeb, 2017).Notably, several of these leading authors are also among the most highly cited scholars in earlier analyses, suggesting both productivity and sustained intellectual influence. Their work has shaped dominant narratives around teacher effectiveness, including professional learning, career-long development, organisational conditions, and measurement frameworks. However, despite their prominence, much of their foundational scholarship emerged prior to the current phase of accelerated digital transformation. This pattern reinforces the observation that contemporary research on teacher effectiveness in the digital era is largely building upon established theoretical traditions rather than originating from a distinct cohort of digitally focused scholars. Consequently, there remains substantial scope for newer researchers to contribute innovative, technology-sensitive perspectives that extend classical effectiveness models to better reflect digitally mediated teaching contexts.

RQ3. Which publications constitute the most influential works in the field of teacher effectiveness, as indicated by citation impact?

Table 2: The most cited author of teacher efectiveness.

	Authors	Title	Year	Source title	Cited by
1	Klassen, R.M.; Tze, V.M.C. (Klassen & Tze, 2014)	Teachers' self-efficacy, personality, and teaching effectiveness: A meta-analysis	2014	Educational Research Review	817
2	Gu, Q.; Day, C. (Q. Gu & Day, 2007)	Teachers resilience: A necessary condition for effectiveness	2007	Teaching and Teacher Education	613
3	Hamre, B.K. et al. (Hamre et al., 2013)	Teaching through interactions: Testing a developmental framework of teacher effectiveness in over 4,000 classrooms	2013	Elementary School Journal	523
4	Kane, T.J. et al. (Kane et al., 2008)	What does certification tell us about teacher effectiveness? Evidence from New York City	2008	Economics of Education Review	457
5	Darling-Hammond, L. Et al. (Darling-Hammond et al., 2005)	Does teacher preparation matter? Evidence about teacher certification, teach for America, and teacher effectiveness	2005	Education Policy Analysis Archives	449
6	Muijs, D. Et al. (Muijs et al., 2014)	State of the art - teacher effectiveness and professional learning	2014	School Effectiveness and School Improvement	360
7	Day, C.; Gu, Q. (Day & Gu, 2007)	Variations in the conditions for teachers' professional learning and development: Sustaining commitment and effectiveness over a career	2007	Oxford Review of Education	352
8	Stronge, J.H. et al. (Stronge et al., 2011)	What makes good teachers good?: A cross-case analysis of the connection between teacher effectiveness and student achievement	2011	Journal of Teacher Education	320
9	Robertson-Kraft, C.; Duckworth, A. (Robertson-Kraft & Duckworth, 2014)	True grit: Trait-level perseverance and passion for long-term goals predict effectiveness and retention among novice teachers	2014	Teachers College Record	267
10	Feldman, K.A. (Feldman, 1987)	Research productivity and scholarly accomplishment of college teachers as related to their instructional effectiveness: A review and exploration	1987	Research in Higher Education	259

The top ten most cited articles reveal that foundational scholarship on teacher effectiveness has been strongly shaped by psychological, professional, and structural perspectives rather than explicitly digital ones. Highly cited works by Klassen and Tze (2014), Gu and Day (2007), and Hamre et al. (2013) emphasise internal teacher attributes such as self-efficacy, personality, resilience, and quality of teacher–student interactions as core determinants of effectiveness. These studies collectively frame teacher effectiveness as a multidimensional construct rooted in motivation, emotional regulation, and sustained professional commitment. Similarly, the prominence of certification-focused studies by Kane et al. (2008) and Darling-Hammond et al. (2005) reflects long-standing debates about teacher preparation pathways, qualifications, and policy accountability, highlighting effectiveness as both an individual and systemic outcome.

Notably, most of these highly cited works predate the widespread integration of digital technologies in education, indicating that contemporary digital-era research is conceptually anchored in earlier theoretical and empirical traditions. Articles by Muijs et al. (2014), Day and Gu (2007), and Stronge et al. (2011) further reinforce the centrality of professional learning, career-long development, and instructional quality in sustaining teacher effectiveness. Even studies addressing perseverance and productivity, such as Robertson-Kraft and Duckworth (2014) and Feldman (1987), foreground personal and scholarly characteristics rather than technological competence. Collectively, this citation pattern suggests that current research on teacher effectiveness in digitally transformed contexts is extending, rather than replacing, established frameworks. It also highlights a conceptual gap, where digital competence, digital well-being, and technology-mediated pedagogy remain underrepresented among the most influential works, underscoring the need for newer studies that explicitly integrate digital dimensions into the core discourse on teacher effectiveness.

RQ4. Which countries are the leading contributors to research on teacher effectiveness in terms of publication output and citation impact?
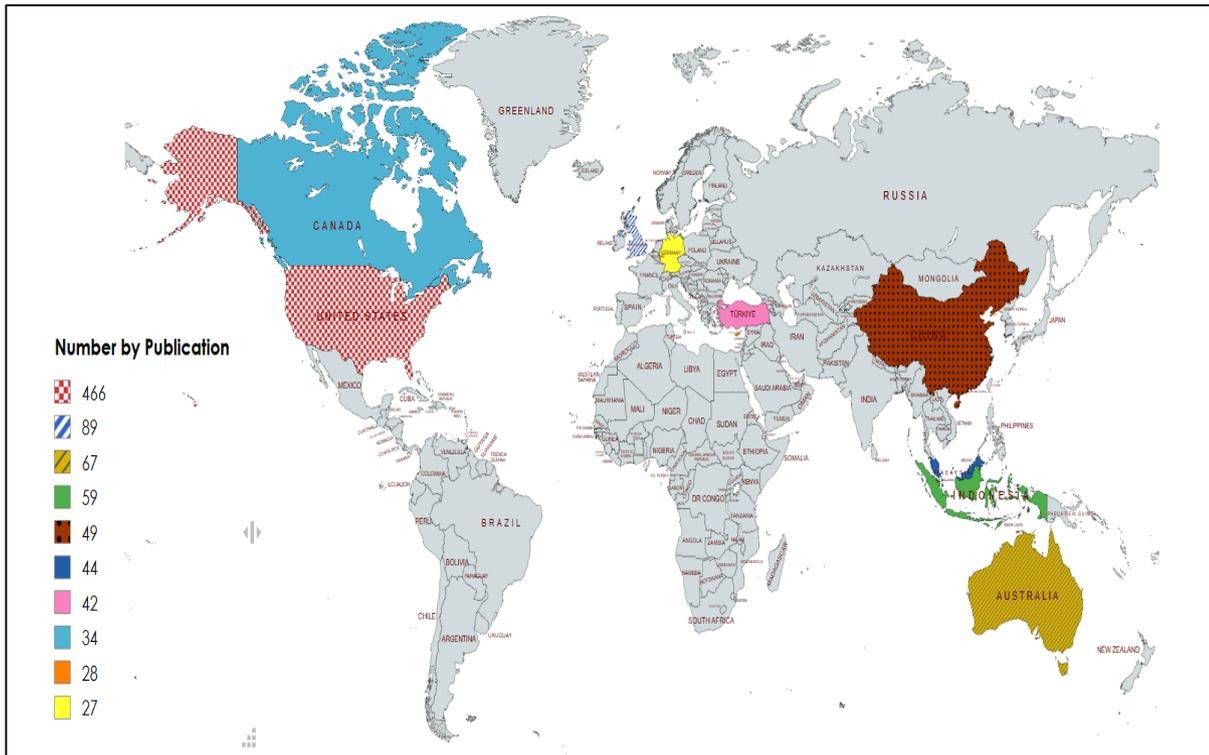
Figure 3: The leading countries that contributes to research on teacher effectiveness

The country-level distribution of publications reveals a clear concentration of research output in a small number of countries, led overwhelmingly by the United States with 466 publications. This dominant position reflects the long-standing emphasis on teacher effectiveness within the U.S. educational research agenda, supported by strong research funding, large-scale datasets, and an established culture of evidence-based educational reform. The United Kingdom (89) and Australia (67) follow at a considerable distance, yet their contributions remain significant, indicating sustained scholarly engagement with teacher effectiveness, often linked to professional standards, accountability frameworks, and teacher development policies. Together, these English-speaking countries shape much of the theoretical and empirical discourse in the field, influencing how teacher effectiveness is conceptualised and measured globally.

Beyond Western contexts, the presence of Indonesia (59), China (49), Malaysia (44), and Turkey (42) among the top contributors signals a growing research momentum in emerging and middle-income education systems. This trend suggests increasing recognition of teacher effectiveness as a strategic lever for educational quality amid rapid digitalisation and systemic reform. Contributions from Canada (34), Cyprus (28), and Germany (27) further demonstrate that interest in teacher effectiveness spans diverse educational traditions and policy environments. Notably, the rising output from Southeast Asian countries such as Indonesia and Malaysia highlights a shift toward more context-sensitive and regionally grounded research, offering alternative perspectives beyond dominant Western narratives. Overall, the geographical distribution underscores both the global relevance of teacher effectiveness and the need for more cross-national and comparative studies to capture how digital-era challenges shape teaching effectiveness across varied socio-cultural and institutional contexts.

The observed distribution of publications by country can be rationalised through a combination of structural, policy, and systemic factors that shape national research capacity and educational priorities. The dominance of the United States reflects its well-established research infrastructure, strong culture of evidence-based policymaking, and long-standing focus on teacher effectiveness as a central lever for improving student outcomes. Large-scale accountability reforms, access to longitudinal datasets, and sustained federal and institutional funding have positioned teacher effectiveness as a persistent research priority. Similarly, the United Kingdom and Australia have strong traditions in educational effectiveness and school improvement research, supported by national teaching standards, inspection regimes, and policy-driven interest in professional quality, which collectively stimulate continuous scholarly output in this area.
The growing contribution from countries such as Indonesia, China, Malaysia, and Turkey can be attributed to rapid educational expansion, digital transformation agendas, and increasing participation in international benchmarking initiatives. These contexts are experiencing heightened pressure to improve teaching quality in response to the massification of education, the digitalisation of learning environments, and global competitiveness. Government-driven reforms, expanding postgraduate research communities, and greater access to international journals indexed in databases such as Scopus have further enabled research visibility from these regions. Meanwhile, countries like Canada, Germany, Cyprus, and Australia benefit from stable research ecosystems and policy interest in teacher development, albeit on a smaller scale due to population size or more decentralised education systems. Overall, the distribution reflects not only differences in research capacity and funding, but also varying stages of digital transformation and policy emphasis on teacher effectiveness across national contexts.

RQ5. What are the dominant and emerging research themes in the field of teacher effectiveness, as reflected through keyword co-occurrence analysis?

Figure 4: Network visualization map of co-occurrence by keywords

Keyword co-occurrence analysis in VOSviewer refers to the examination of how frequently keywords appear together within the same documents, revealing conceptual relationships and thematic structures in a research field. In this approach, keywords that co-occur more often are assumed to share stronger conceptual or topical connections. VOSviewer visualises these relationships through network maps, where each keyword represents a node, the frequency of appearance is reflected by node size, and the strength of co-occurrence relationships is indicated by link thickness and total link strength. Thus, co-occurrence analysis does not merely identify popular terms, but uncovers how ideas cluster, interact, and collectively shape the intellectual structure of research on teacher effectiveness.

In generating the keyword co-occurrence map, a full counting method was applied, meaning that every occurrence of a keyword within a document was counted equally, regardless of repetition. A minimum threshold of five occurrences was set to ensure analytical robustness and to reduce noise from rarely used or idiosyncratic terms. As a result, 160 keywords were retained from an initial pool of 1,640 keywords, representing the most salient and recurrent concepts within the dataset. This threshold-based filtering allows the map to focus on dominant research themes while maintaining sufficient conceptual diversity to reflect the breadth of the field.

The findings from the co-occurrence network highlight teacher effectiveness as a central and highly connected construct, strongly linked with professional development, teacher education, educational policy, and teaching effectiveness. High total link strength values for keywords such as professional development, teacher education, self-efficacy, instructional leadership, and teacher evaluation indicate that research in this field is heavily anchored in human, organisational, and policy-oriented dimensions. At the same time, the presence of keywords related to digital contexts, such as online teaching, e-learning, TPACK, digital competence, and digital literacy suggests a growing, though still secondary, integration of digital-era concerns. Collectively, these patterns demonstrate that the body of knowledge on teacher effectiveness is evolving from traditional pedagogical and evaluative foundations toward a more multidimensional framework that increasingly acknowledges digital transformation, thereby reinforcing the relevance of examining teacher effectiveness within contemporary, technology-mediated educational environments.

RQ6. How do international co-authorship networks shape scholarly collaboration in teacher effectiveness research across countries?

Figure 5: Network visualization of co-authorship by countries

Country-level co-authorship analysis in VOSviewer examines how scholars from different countries collaborate on the same publications, thereby revealing the international structure of knowledge production within a research field. In this network, each country represents a node, the number of documents indicates research productivity, citations reflect scholarly influence, and total link strength measures the intensity of collaborative relationships with other countries. A higher total link strength signifies stronger and more frequent cross-national collaboration, positioning a country as an important connector within the global research network. This form of analysis moves beyond counting publications by highlighting how research on teacher effectiveness is collectively constructed through international partnerships.

The collaboration map was generated using a full counting method, in which each participating country received equal credit for a publication regardless of the number of co-authors or institutions involved. To enhance analytical clarity and robustness, a minimum threshold of five documents was applied, resulting in 47 countries being retained from an initial set of 89. This threshold ensured that the visualised network focused on countries with sustained research activity rather than sporadic or isolated contributions. By filtering the dataset in this way, the resulting map more accurately represents stable collaboration patterns and identifies core and peripheral actors within the global teacher effectiveness research community.

The findings indicate that the United States occupies a dominant and central position, combining the highest research output (474 documents), citation impact (10,604 citations), and strong collaborative ties. The United Kingdom demonstrates the highest total link strength, underscoring its role as a major international collaboration hub. Countries such as China and Malaysia show relatively high total link strength compared to their publication counts, suggesting strategic engagement in cross-national research despite more moderate citation levels. Notably, emerging and non-Western contexts including Indonesia, Saudi Arabia, Turkey, and Malaysia are increasingly visible within the collaboration network, reflecting the growing globalisation of teacher effectiveness research. Collectively, these patterns contribute to the body of knowledge by demonstrating that research on teacher effectiveness in the digital era is no longer confined to traditional Western centres but is increasingly shaped through international collaboration that enriches theoretical diversity, contextual relevance, and methodological exchange.

Conclusion

This bibliometric study was conducted to map the evolution, structure, and knowledge patterns of research on teacher effectiveness. The analysis addressed key questions related to publication trends over time, influential articles, leading authors, dominant contributing countries, thematic emphases, and international collaboration networks. By systematically examining these dimensions, the study aimed to provide a comprehensive overview of how scholarship on teacher effectiveness has developed and how research efforts are organised globally.

The findings demonstrate a clear expansion of research activity, with a slow and fragmented early phase followed by rapid growth from the early 2010s onward. This growth reflects increasing scholarly attention to teacher effectiveness as a central element of educational quality. Citation analysis shows that a limited number of highly influential publications continue to shape the field, largely grounded in psychological, professional, and organisational perspectives. Author and country analyses reveal a concentration of productivity and impact among a small group of scholars and nations, while also indicating a gradual broadening of participation from emerging regions. Thematic analysis based on keyword co-occurrence highlights professional development, teacher education, self-efficacy, evaluation, and instructional quality as core research foci, with digital-related themes gaining visibility but remaining secondary.

The study contributes to the field by offering a structured synthesis of a large and fragmented body of literature, clarifying the intellectual foundations and emerging directions of teacher effectiveness research. By integrating temporal, thematic, and collaborative analyses, this work extends prior reviews and provides a macro-level understanding of how research priorities have shifted over time. The findings also offer practical value by identifying dominant themes and collaboration patterns that may guide future research planning, policy discussions, and international partnerships in education.

Several limitations should be acknowledged. The analysis relied on a single database and English-language publications, which may limit the representation of region-specific or non-indexed research. In addition, bibliometric methods capture patterns of production and linkage rather than the depth or quality of individual studies. Future research could incorporate multiple databases, comparative regional analyses, and longitudinal thematic modelling to address these limitations. Overall, this study demonstrates the value of bibliometric analysis in revealing trends, structures, and collaborations within teacher effectiveness research, providing a solid foundation for more focused and context-sensitive investigations in the future.

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