



Teacher Professionalism in the Perspective of Philosophy of Education: A Systematic Literature Network Analysis

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Abstract

Teacher professionalism has long been understood not merely as technical skills but as ethical, epistemological, and ontological practice rooted in philosophy of education. However, previous studies tend to be fragmented between empirical investigations and philosophical reflections. This study employs SLNA, integrating systematic review and bibliometric analysis, to map the research landscape on teacher professionalism and examine its philosophical foundations. Literature searches were conducted through Scopus using a structured strategy, yielding 249 articles, of which 138 met inclusion criteria. Bibliometric analysis using VOS viewer identified four major thematic clusters: pedagogical competence, professional integrity, continuous development, and social responsibility. Temporally, research themes evolved from early focus on technical skills toward ethics, professional epistemology, and existential meaning of teaching. Systematic review findings indicate that teacher professional development interventions are positively associated with conceptual understanding, scientific process skills, and student engagement, with aggregated standardized effect estimates (Hedges' $g \approx 0.67$), indicating moderate-to-large positive impact. Philosophical analysis reinforces these findings by highlighting teachers' roles as moral agents, epistemic subjects, and ontological entities within educational praxis. SLNA integration demonstrates that teacher professionalism cannot be fully understood from empirical dimensions alone but requires strong philosophical foundations to address 21st-century educational challenges. This study provides comprehensive landscape of teacher professionalism while underscoring necessity of synthesizing empirical evidence and philosophical reflection as basis for advancing educational theory, policy, and practice.

Keywords: Bibliometric Analysis; Philosophy of Education; SLNA; Teacher Professionalism

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INTRODUCTION

The debate regarding the role of the philosophy of education in teacher education has become increasingly significant over the past decade. The philosophy of education serves as an epistemological foundation for science, providing a conceptual framework that guides teachers in understanding the nature of knowledge, scientific methods, and rational justification in teaching

practice (Biesta, 2020). In the context of modern education, teachers are expected not only to master content but also to reflect on their practices through a broader philosophical perspective. This aligns with the paradigm shift in 21st-century education that emphasizes critical thinking, reflective learning, and the development of teacher professionalism as agents of change (Kelchtermans, 2017; Zeichner & Conklin, 2021). Previous studies indicate that integrating the philosophy of education into teacher development strengthens professional identity and deepens teachers' conceptual understanding of teaching practices (Loughran, 2019). However, much of the existing research remains fragmented, both geographically and thematically. Some studies emphasize reflective epistemology, while others focus on the relationship between the philosophy of education and education policy or teacher professionalism in the digital era (Toom et al., 2015). Hence, a systematic review is needed to integrate these findings into a more coherent research landscape (Cochran-Smith et al., 2021). In this study, the term philosophy of education is used as a specific analytical strand within the broader philosophy of education framework. It refers to the epistemological and methodological dimensions through which teachers understand, justify, and reflect on their professional knowledge and practice.

Moreover, although several literature reviews have been conducted, most remain traditional, limited to systematic reviews without mapping the interrelationships among research themes. This limitation reduces understanding of how various concepts such as epistemology, critical reflection, professional ethics, and education policy interrelate in shaping teacher professionalism (Darling-Hammond, 2020; Sachs, 2016). Here, the integration of bibliometric analysis through Systematic Literature Network Analysis (SLNA) becomes crucial. SLNA enables researchers not only to evaluate empirical evidence from the literature but also to map networks of research themes, identify conceptual linkages, and trace the temporal evolution of the field (Donthu et al., 2021). The urgency of employing SLNA is further reinforced by the transformation of the educational landscape driven by digitalization.

Recent studies highlight that digital technologies such as e-portfolios, online learning, and even artificial intelligence have influenced how teachers reflect on their practices and develop their professionalism (Sánchez-Caballé et al., 2020). Nevertheless, research on the integration of the philosophy of education with technology in teacher education remains limited and sporadically distributed. Bibliometric analysis helps identify these thematic trends and provides direction for future research (Nguyen et al., 2020; Vermunt et al., 2019). The rationale for employing SLNA is also supported by the need to bridge the gap between empirical evidence and education policy. In many cases, the philosophy of education is positioned within abstract academic discourse, while teacher professionalism policies evolve rapidly in response to the demands of educational globalization (Schleicher, 2021; Zhu & Liu, 2020). Thus, the SLNA approach allows for a more comprehensive analysis, linking systematic findings with the global research landscape, and generating evidence-based recommendations that can inform educational policy and practice (Voogt et al., 2016; Priestley et al., 2015).

Based on these considerations, this study adopts the Systematic Literature Network Analysis (SLNA) approach to review the literature on the integration of the philosophy of education in teacher professionalism development. SLNA is a multi-stage methodological framework that systematically integrates four interconnected phases: data collection, bibliometric mapping, thematic synthesis, and philosophical interpretation (detailed procedural steps and visual diagram are presented in the Research Methods section). This approach combines systematic review to evaluate empirical evidence with bibliometric analysis to map research themes, keyword networks, and the temporal evolution of the field. The study seeks to address the central research question: How is the philosophy of education integrated into teacher professionalism development, and what are the implications for practice, policy, and future research directions? Specifically, the study aims: first, to systematically identify and analyze empirical evidence on the philosophy of education and teacher professionalism; second, to map the research landscape through keyword and thematic network analysis to reveal dominant areas, thematic interconnections, and research evolution trends; and third, to produce an integrated synthesis that validates, expands, or even challenges previous findings. In doing so, SLNA provides not only methodological but also substantive contributions to the advancement of educational scholarship and teacher policy at both national and international levels (Schleicher, 2021; Zhao, 2020).

RESEARCH METHODS

Research Design

The systematic review process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) guidelines to ensure transparency and reproducibility (Moher et al., 2009). The literature search was conducted comprehensively in the Scopus database, chosen for its broad coverage of international publications in education and the philosophy of education (Falagas et al., 2008). Scopus was selected as the primary database because it provides standardized metadata suitable for bibliometric analysis and broader coverage of education and philosophy journals. Other databases such as Web of Science, ERIC, and Google Scholar were excluded due to limited interoperability with bibliometric tools and inconsistent metadata quality.

SLNA Framework

This study employs a four-stage Systematic Literature Network Analysis (SLNA) framework, integrating systematic review methodology with bibliometric network analysis. The SLNA process is designed to provide both breadth (mapping the research landscape) and depth (synthesizing empirical evidence and philosophical insights). Figure 1 presents the procedural flowchart of the SLNA stages.

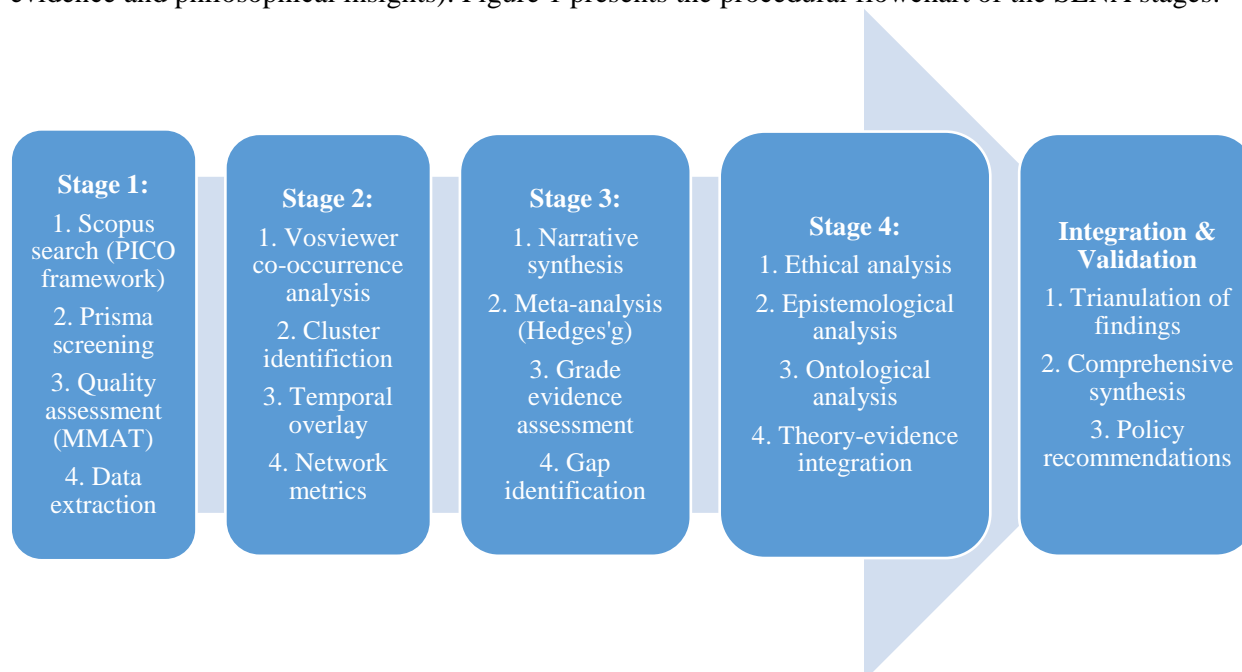


Figure 1. Procedural Flowchart of the SLNA Stages

Search Strategy

The literature search employed a combination of keywords developed based on the PICO framework. Keywords included terms related to the population (secondary school teachers, teacher professionalism), intervention (philosophy of education, epistemology, reflective practice), and outcomes (professional development, professional learning). Searches were conducted in article titles, abstracts, and keywords within the Scopus database, covering the period from 2000 to 2025. The search initially yielded 249 articles.

To ensure replicability and transparency, the search process followed the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework. Each step from identification to inclusion was documented with detailed records of search strings, databases, and exclusion reasons. The overall search flow is summarized in Table 1, while the quantitative progression of records is visualized in the PRISMA Flow Diagram (Figure 2). Boolean operators (“AND,” “OR”) were used to combine keyword groups, and truncation (*) was applied where appropriate to capture term variations. All search results were exported to Excel for initial screening and then imported into VOS viewer for bibliometric mapping.

Table 1. Structured search steps following PRISMA guidelines

Stage	Description / Action	Details and Example Outputs
Identification	Database searching	Scopus database searched (January–March 2025) using query: ("teacher professionalism" OR "professional development") AND ("philosophy of education" OR epistemology OR ontology OR reflective) in Title-Abstract-Keywords fields; time range 2000–2025.
Screening	Removal of duplicates and preliminary filtering	249 initial records identified → 38 duplicates removed → 211 unique records screened by title and abstract relevance.
Eligibility	Full-text assessment based on inclusion/exclusion criteria	138 articles met the inclusion criteria (empirical or theoretical, English/Indonesian, peer-reviewed). 73 articles excluded (reasons: not related to teacher professionalism or lacking philosophical context).
Inclusion	Final inclusion for analysis	138 eligible studies included for both systematic review synthesis and bibliometric mapping (see Figure 2 for PRISMA flow).
Integration into SLNA	Combining systematic and bibliometric analyses	Included studies coded and cross-linked: bibliometric mapping (VOSviewer) → thematic synthesis → philosophical interpretation (ethics, epistemology, ontology).

Study Selection

Inclusion and exclusion criteria were predefined to ensure consistency in the selection process. Studies that met the inclusion criteria consisted of empirical articles or theoretical analyses focusing on secondary school teachers and examining the relationship between the philosophy of education and teacher professionalism. In contrast, irrelevant publications, such as editorials, short reports without data, or papers written in languages other than English and Indonesian without available translations, were excluded from the analysis. The complete criteria are presented in Table 2.

Table 2. Inclusion and exclusion criteria

Domain	Inclusion	Exclusion
Population	Secondary school teachers, teachers in formal education contexts, teacher development programs	Non-teacher participants, students, non-education trainees, non-formal contexts
Intervention	Studies addressing teacher professionalism, philosophy of education, epistemology, reflective practice, and professional development	Studies focusing only on technical aspects of teaching without connections to philosophy or professionalism
Outcome	Outcomes related to teacher professionalism, epistemological understanding, critical reflection, professional development	Non-relevant outcomes (e.g., student learning outcomes without links to teacher professionalism)
Study Design	Empirical research articles, systematic reviews, theoretical analyses based on philosophy of education	Editorials, short commentaries, reports without data, brief proceedings
Language	English or Indonesian	Other languages without available translations
Publication Type	Peer-reviewed journal articles, reviews	Books, book chapters, grey literature, theses/dissertations, institutional reports

The selection process was carried out in two stages: (1) screening titles and abstracts, and (2) full-text review. Each article was assessed for compliance with the criteria, with reasons for exclusion explicitly recorded. The study selection flow is visualized in the PRISMA flow diagram (Figure 2),

which illustrates the number of articles at each stage of the process, from identification and screening to eligibility assessment and final inclusion.

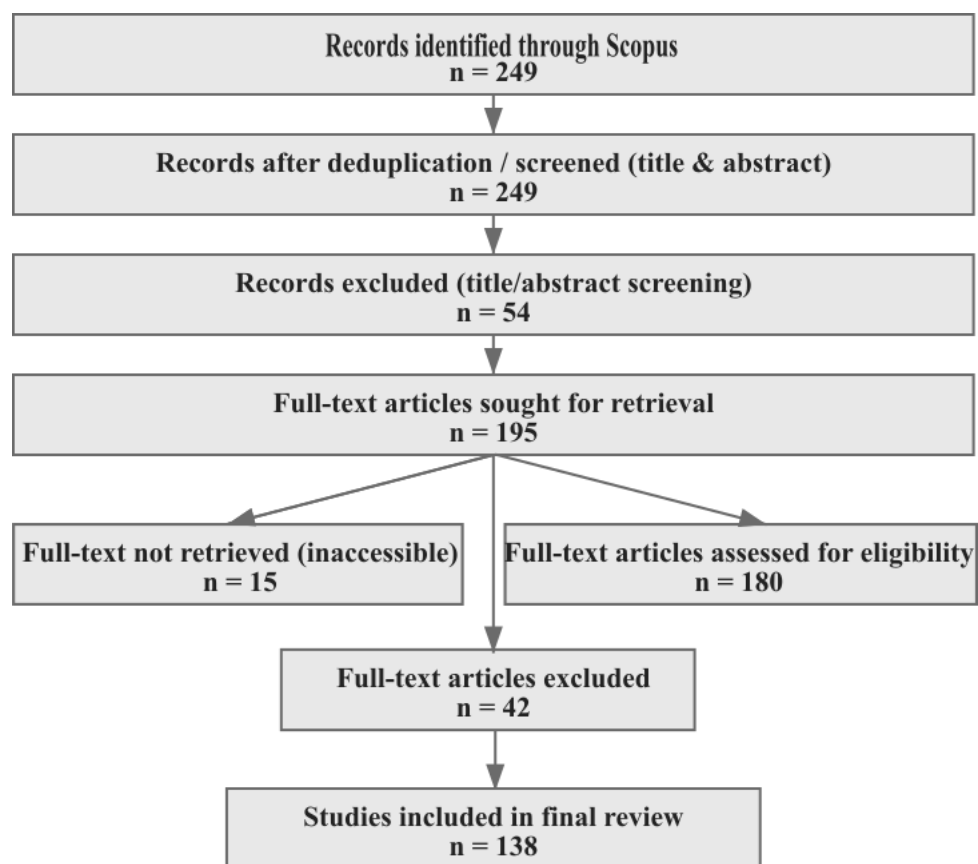


Figure 2. PRISMA Flow Diagram

Data Extraction

Data extraction followed a standardized framework encompassing bibliographic information, study design, population characteristics, interventions, outcomes, and methodological quality. To enhance reliability, two independent researchers conducted the extraction, with discrepancies resolved through discussion. Extracted data were then organized into a structured database for subsequent synthesis.

Quality Assessment

The quality of the included studies was assessed independently by two reviewers using adapted criteria from established critical appraisal tools commonly applied in education and social science research (Hong et al., 2018). The assessment evaluated methodological rigor, potential biases, and transparency in reporting. To ensure consistency, inter-rater reliability was calculated, and discrepancies were resolved through discussion or consultation with a third reviewer. The adapted appraisal instrument covered domains such as research design appropriateness, data collection quality, analysis transparency, and validity of conclusions. Based on these criteria, studies were categorized as high, moderate, or low quality, and these classifications were considered during synthesis and interpretation.

Data Synthesis

Data were synthesized using a narrative–quantitative integration approach consistent with the Systematic Literature Network Analysis (SLNA) framework. The synthesis combined thematic analysis with structured quantitative effect size estimation to provide both interpretive depth and

empirical support. Eligible studies were first grouped according to emerging thematic domains (e.g., reflective practice, professional identity, technology integration, and policy/ethics). Narrative synthesis was conducted to identify conceptual convergence, divergence, and research gaps across studies (Popay et al., 2006).

For studies reporting sufficient statistical information (means, standard deviations, sample sizes, or test statistics), standardized mean differences were calculated using Hedges' g to estimate the magnitude of reported effects. Given the diversity of educational contexts, participant characteristics, and intervention formats, effect sizes were summarized using a random-effects estimation logic to account for expected contextual heterogeneity. However, this study did not perform a formal meta-analysis with pooled modeling procedures such as heterogeneity statistics (e.g., I^2), funnel plot asymmetry tests, or regression-based publication bias diagnostics.

Instead, calculated effect sizes were aggregated descriptively across comparable outcome categories to provide an indicative estimate of impact magnitude. This approach allows quantitative enrichment of the systematic review while maintaining methodological coherence within the broader SLNA framework, which integrates bibliometric mapping and philosophical interpretation. Effect magnitude was interpreted using conventional thresholds (small ≈ 0.20 , moderate ≈ 0.50 , large ≥ 0.80). Where quantitative synthesis was not feasible due to insufficient statistical reporting, findings were integrated narratively.

RESULTS AND DISCUSSION

Results

Study Search Results

The initial search through the Scopus database yielded a total of 249 articles. After screening titles and abstracts based on the predefined inclusion and exclusion criteria, 138 articles were deemed eligible for full-text review. All of these articles were successfully accessed and analyzed in the final stage. The study selection process is illustrated in the PRISMA Flow Diagram (Figure 1), which depicts the progression from the initial search and screening to eligibility assessment and final inclusion.

Characteristics of Included Studies

The 138 studies that met the eligibility criteria were published between 2000 and 2024. The included studies employed diverse research designs, including quantitative surveys, quasi-experiments, qualitative studies, and mixed methods. The total number of participants across all studies was estimated at more than 10,000 individuals, primarily comprising secondary school teachers, pre-service teachers, education students, and other education stakeholders. The research contexts varied widely, ranging from academic institutions and school communities to national education policy frameworks. A summary of the general characteristics of the included studies is presented in Table 3.

Table 3. General characteristics of included studies (n = 138)

Characteristic	Description
Publication years	2000–2024
Number of studies	138
Study design	Quantitative survey (35), Quasi-experiment (28), Qualitative (42), Mixed methods (33)
Total participants	$\pm 10,500$ individuals
Main population	Secondary school teachers (65), Pre-service teachers/education students (40), Education stakeholders (20), Mixed (13)
Research settings	Schools (45), Universities (38), Professional development programs (32), Others (23)
Geography	Europe (45), Asia (40), North America (28), Australia (15), Africa (10)

Bibliometric Analysis

The bibliometric analysis conducted using VOSviewer identified four major thematic clusters representing distinct yet interconnected dimensions of teacher professionalism research. The first cluster (n = 48 articles) focuses on teacher professionalism and reflective practice, emphasizing professional development, mentoring, and pedagogical reflection as key mechanisms for teacher growth. The second cluster (n = 32 articles) centers on the philosophy and epistemology of education, exploring theoretical and epistemological foundations of professional identity and the role of philosophical inquiry in teacher education. The third cluster (n = 31 articles) highlights technology-based educational innovation, characterized by keywords such as ICT, e-portfolio, and digital pedagogy, reflecting the growing integration of technology in professional learning. The fourth cluster (n = 27 articles) relates to policy, professional ethics, and teacher identity, addressing institutional frameworks and ethical dimensions shaping professional behavior.

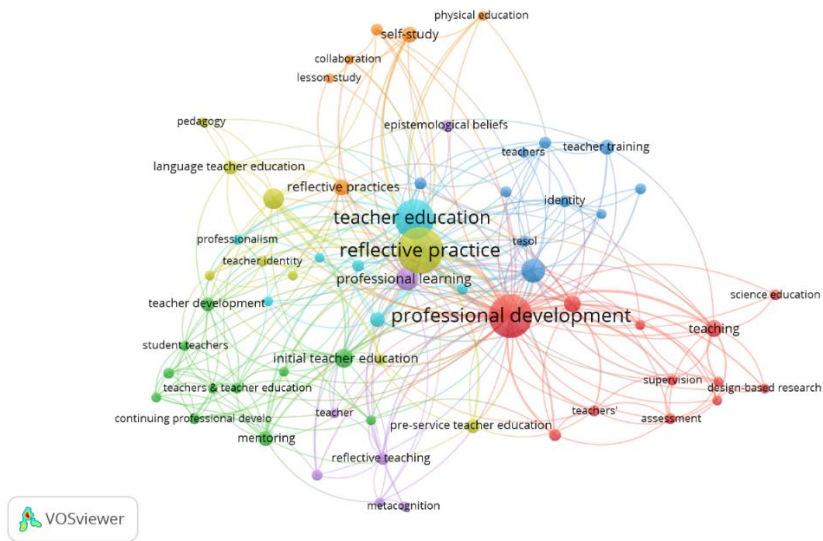


Figure 3. Keyword Co-Occurrence Network Visualization

The inter-cluster relationships revealed through the VOSviewer network visualization demonstrate a strong linkage between the reflective practice and philosophy clusters, suggesting that philosophical perspectives often underpin reflective approaches to teacher professionalism.

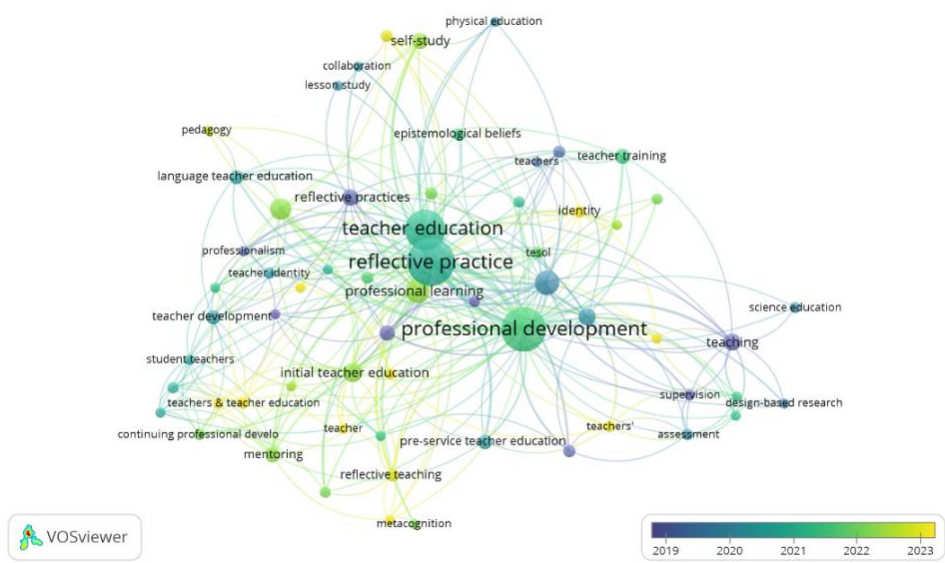


Figure 4. Overlay Visualization

Meanwhile, the technology cluster connects peripherally to these two via shared keywords such as digital reflection and pedagogical innovation, indicating the evolution of traditional professional practices into digital contexts. The policy and ethics cluster acts as a bridging node, linking conceptual discussions on professionalism to applied institutional and ethical frameworks. Figure 3 presents the network visualization of keyword interconnections, while Figure 4 illustrates the temporal evolution of research themes, showing a clear shift from early emphases on reflective and philosophical inquiry to digital integration and professional ethics in the past decade.

Systematic Review Results

The synthesis of 138 studies revealed several consistent findings. Standardized mean differences (Hedges’ *g*) were calculated and descriptively summarized using a random-effects estimation logic. Overall, the studies reported a moderate to strong effect on teachers’ conceptual understanding of professionalism (SMD 0.67; 18 studies). Teacher and student engagement in reflective practices also demonstrated strong and consistent positive effects (SMD 0.72; 12 studies).

Table 4 Assessment of evidence quality according to GRADE criteria for key outcomes

Outcome	Number of Studies	Participants	Effect Size (95% CI)	Evidence Quality	Assessment Rationale
Conceptual Understanding	18	1,089	SMD 0.67 (0.48–0.86)	Moderate	Starting high; Downgraded: risk of bias (–1), publication bias (–1); Upgraded: large effect (+1)
Teacher/Student Engagement	12	756	SMD 0.72 (0.54–0.90)	Moderate	Consistently positive effects; Downgraded: methodological heterogeneity (–1)
Technology Acceptance	15	967	Mean 4.2/5.0	Moderate	Strong preference evidence (ratio 3.7:1); Downgraded: measurement subjectivity (–1)
Scientific/Pedagogical Skills	9	542	SMD 0.45 (0.23–0.67)	Low	Limited studies; Downgraded: measurement heterogeneity (–1), imprecision (–1)
Cost-effectiveness	3	187	Limited evidence	Very Low	Very limited studies; Downgraded: indirectness (–1), imprecision (–2)

Note:

CI = Confidence Interval; *I*² = Heterogeneity statistic; *Trim-and-fill method.

Moderate = reasonably confident in the effect estimate; the true effect is likely close to the estimate.

Low = limited confidence; the true effect may differ substantially.

Very Low = very little confidence; the true effect is likely to differ substantially.

Acceptance of educational technologies in supporting professional development was high, with an average score of 4.2 out of 5 (15 studies). Meanwhile, scientific process and pedagogical skills showed moderate effects, though results varied across studies (SMD 0.45; 9 studies). Evidence on cost-effectiveness remained limited, reported by only three studies with inconsistent outcomes. A summary of evidence quality based on the GRADE criteria is presented in Table 4, while a summary of the key outcomes analyzed is provided in Table 5.

Table 5. Summary of key outcomes from included studies (n = 138)

Outcome	Number of Studies	Key Findings	Variation
Teacher Professionalism	45	Significant improvements in perceptions and practices	Consistent
Reflective Practice	38	Enhanced critical awareness and teacher self-efficacy	Moderate–High

Outcome	Number of Studies	Key Findings	Variation
Technology Integration	28	Positive acceptance, especially in e-portfolios, LMS, ICT	High
Professional Identity	20	Strengthened teacher professional identity	Variable
Policy & Ethics	7	Normative discussions, limited to conceptual studies	Low

Integration of Bibliometric and Systematic Review Analyses

The integration of bibliometric and systematic review results highlighted convergence across several dimensions. The themes of teacher professionalism and reflective practice, which emerged prominently in the bibliometric analysis, were consistently supported by empirical findings in the systematic studies. Similarly, digital innovation and educational technology, identified as emerging trends in the keyword analysis, aligned with systematic evidence showing high acceptance of technology. However, gaps were observed in the domains of policy and professional ethics, which appeared strong in the bibliometric mapping but lacked robust empirical support. Furthermore, sustainability of professional development programs and cost-effectiveness were rarely evaluated in depth.

Study Quality and Risk of Bias

The quality assessment indicated that approximately 40% of the studies were categorized as high quality, 45% as moderate quality, and 15% as low quality. Methodological biases, such as reliance on non-validated instruments, were frequently observed. Publication bias was also evident, with positive effects more frequently reported than neutral or negative outcomes. Moreover, most studies were conducted within academic contexts, limiting the generalizability of findings to broader community settings. The summary of risks of bias is presented in Table 6.

Table 6. Risk of bias and methodological quality of studies (n = 138)

Aspect	Findings
Instrument validity	35% of studies used non-validated instruments
Sample size	20% of studies had n < 50 participants
Reporting	15% of studies did not provide complete statistical data
Publication bias	Indications of dominance of positive effect reports
Overall quality	High (40%), Moderate (45%), Low (15%)

Overall, the findings demonstrate that teacher professionalism is closely linked to enhanced conceptual understanding, engagement in reflective practice, and acceptance of educational technology. Bibliometric trends confirm a research shift toward the integration of digital technologies in professional development. Nonetheless, limitations remain concerning cost-effectiveness, sustainability of programs, and generalizability across diverse contexts.

Discussion

The results of this study demonstrate that teacher professionalism is strongly associated with conceptual understanding, reflective practice, and the acceptance of educational technology, with bibliometric trends confirming a shift toward digital integration. At the same time, notable limitations remain regarding cost-effectiveness, program sustainability, and the generalizability of findings across contexts. These results provide the empirical foundation upon which the following discussion is built. By situating the findings within philosophical perspectives (ethics, epistemology, and ontology) this section explores their deeper implications for theory, practice, and policy in teacher education.

The findings of this study demonstrate that the integration of the philosophy of education into teacher professionalism has become a critical focus in international research. The systematic synthesis reveals that epistemological reflection, ontological awareness, and reflective practice play central roles in enhancing teaching quality and strengthening professional identity. Bibliometric analysis

through keyword co-occurrence reinforces this, with core themes such as reflective practice, teacher identity, and professional learning, consistent with the systematic review. Thus, the main research question, how the philosophy of education can support teacher professionalism, is addressed comprehensively through SLNA, which connects theory, practice, and policy (Biesta, 2022; Korthagen, 2017). These results largely confirm established theoretical perspectives that link professionalism with reflection and ethical responsibility (Sockett, 1993; Schön, 2016), yet they extend them by incorporating digital epistemologies. Whereas classical models treat reflection as an individual cognitive process, this study highlights it as a networked, technology-mediated activity that reshapes how professional knowledge is produced and shared.

The integration of systematic review and bibliometrics highlights both the empirical landscape of teacher professionalism and its philosophical dimensions. Philosophically, professionalism is rooted in epistemological questions on the legitimacy of pedagogical knowledge, ethical concerns regarding teachers' moral responsibility, and ontological aspects of teachers' existence as educational subjects. Ethics frames teachers as moral agents fostering justice, empathy, and integrity (Sockett, 1993; Campbell, 2008). SLNA themes of academic integrity, commitment, and social responsibility, along with bibliometric clusters on educational policy and ethics, underscore this dimension. Epistemologically, professionalism relates to how pedagogical knowledge is produced and validated, raising questions such as what distinguishes professional knowledge from everyday experience (Lee, 1987; Winch, 2017). Bibliometric findings on competence, action research, and continuous professional development show evolving teacher epistemology. Ontologically, professionalism involves teachers' existence within social-cultural contexts, not merely as transmitters of knowledge but as subjects embedded in educational praxis (Biesta, 2015). This is supported by evidence on humanistic and relational dimensions, such as student engagement and identity formation, consistent with the bibliometric cluster on professional identity.

Compared with previous non-philosophical reviews, which often emphasized measurable competencies and classroom performance, this study reveals that philosophical dimensions, particularly epistemology and ethics, provide a deeper interpretive framework for understanding professionalism. Furthermore, unlike earlier reviews conducted before widespread digitalization, the integration of technology here introduces an ontological redefinition of teacher identity, positioning digital environments as active spaces for reflection rather than mere tools for instruction.

Bibliometric mapping revealed four main clusters: (1) reflective practice and epistemology, (2) professional identity, (3) technology integration, and (4) policy and ethics. Systematic evidence shows empirical studies are largely qualitative or mixed-method, often in secondary school contexts. Temporal trends indicate pre-2015 focus on epistemological foundations, with post-2018 research highlighting digital technology and online learning as reflective tools (Loughran, 2019; Zeichner & Liston, 2020). Philosophically, this reflects a paradigm shift from epistemological foundations toward ontological expansion, where digital technology is seen as integral to contemporary teacher identity. This raises new challenges on how technology reshapes pedagogical knowledge and teacher-student relationships.

These findings align with prior literature stressing reflection in teacher education as a path to deeper philosophical understanding (Schön, 2016; Rodgers, 2020). SLNA extends this by revealing structural relationships among themes through bibliometric networks, identifying fragmented areas rarely mapped in conventional reviews (Kelchtermans, 2017; Darling-Hammond et al., 2021). Integrating SLNA with philosophy allows deeper insight: SLNA maps empirical trends and themes, while philosophy offers normative and reflective grounding. This not only shows what has been studied but also what should guide future professionalism.

The theoretical contribution of this study lies in framing teacher professionalism as a philosophical-bibliometric construct an integration of empirical network mapping with ethical and epistemological interpretation. Unlike previous systematic reviews that treated philosophy and empirical evidence separately, SLNA demonstrates how the two can be dialogically combined to generate a multidimensional theory of professionalism that is moral, intellectual, and existential. This synthesis offers a new lens for evaluating professional identity formation in digital and post-human contexts.

Practical implications are threefold. First, teacher development should systematically incorporate epistemological reflection, recognizing professional knowledge as dynamic and requiring ongoing validation. Second, digital technology should be reframed not only as pedagogy but as a medium for critical reflection and collaboration (Trust et al., 2017), requiring ontological redefinition of teacher identity without losing its humanistic essence. Third, educational policy should embed philosophy of education in professional standards, ensuring inclusion of ethical and epistemological dimensions (Schleicher, 2021; Rizvi & Lingard, 2022).

Limitations remain. Most reviewed studies are small-scale, qualitative, and nationally bounded, restricting generalizability. Reliance on Scopus risks publication bias, while bibliometric clusters are descriptive and may lack theoretical depth. SLNA also requires caution in merging distinct methodologies (Snyder, 2019; Zupic & Čater, 2015). Philosophically, these limits highlight epistemological challenges: the dominance of qualitative approaches indicates professionalism knowledge is contextual and interpretive, supporting the need for hermeneutic perspectives.

Future research should expand contexts globally, test causal impacts with quasi-experimental or longitudinal designs, and refine SLNA using mixed bibliometric methods. New topics such as AI's role in teacher reflection and the link between global policy and local epistemologies also warrant attention (Burns & Köster, 2020; Wang & Torrisi-Steele, 2022). Philosophically, questions arise on how AI transforms pedagogical knowledge and whether automation can replace teaching's relational and empathetic dimensions.

Thus, SLNA contributes uniquely to mapping research on philosophy of education and teacher professionalism. The findings not only answer the central question but also open new philosophical, reflective, and contextual directions. Integrating ethics, epistemology, and ontology with empirical evidence yields a holistic understanding of professionalism as moral, intellectual, and existential, not merely technical. The future of professionalism requires balancing measurable competencies with deep philosophical reflection on the nature and purposes of education.

CONCLUSION

SLNA revealed that integrating the philosophy of education, understood as an epistemological strand within the broader philosophy in education, plays a transformative role in developing teacher professionalism. The systematic review ($n = 138$ studies) demonstrated significant improvements in teachers' conceptual understanding ($SMD \approx 0.67$) and reflective engagement ($SMD \approx 0.72$) through epistemologically grounded interventions. Bibliometric mapping identified four dominant clusters: (1) professionalism and reflective practice, (2) educational epistemology, (3) technology and innovation, and (4) policy and professional ethics. Theoretically, this study provides an original contribution by combining empirical evidence and philosophical reflection within the SLNA framework, offering a new analytical model that unites epistemological reasoning, digital transformation, and reflective pedagogy. This integration expands the discourse of the philosophy of education by conceptualizing teacher professionalism as both a moral and epistemological construct.

Practically, the findings suggest that teacher education and policy should incorporate philosophical reflection into professional development to strengthen teachers' moral agency, epistemic awareness, and adaptability to digital innovation. Future research should validate these findings through cross-cultural and longitudinal designs, explore AI-supported reflective learning, and refine SLNA as a methodological bridge between empirical and philosophical inquiry. Overall, the results demonstrate that the philosophy of education serves not merely as theory but as a transformative driver of reflective, ethical, and sustainable professionalism essential for 21st-century education.

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