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Teacher self-efficacy: A systematic review of personal and contextual factors and their impact on educational practice

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ABSTRACT

Despite the growth of the field, analyzing the construct of teacher self-efficacy remains challenging due to the heterogeneity of measurements, designs, and contexts. This systematic review clarifies the state of the art by analyzing studies published between 2015 and 2025. Following PRISMA guidelines, a search was conducted in Web of Science and Scopus using predefined criteria (quantitative designs, in-service teachers, samples ≥150, and publications in English). From an initial screening of 560 records, 123 studies from 41 countries were included, with Asia (47.2%) and Europe (30.9%) the most represented regions. Cross-sectional designs predominated (58.5%), while longitudinal studies accounted for 16.3%. Theoretically, 71.5% of studies drew on Social Cognitive Theory, and 32.5% adopted the three-dimensional model. Measurement approaches showed diversity, including the classical three-dimensional structure, unidimensional formats, and models with more than three factors, thereby limiting comparability. Consistent correlates of teacher self-efficacy included instructional leadership, school climate, and institutional/collegial support. At a personal level, findings revealed non-linear patterns related to years of teaching experience, context-dependent gender differences, and links to emotional resources. The evidence underscores the need to standardize instruments and reporting practices and to expand longitudinal and multilevel designs to test causal mechanisms. In terms of policy and practice, this review advocates for making the development of teacher self-efficacy explicit in both initial and ongoing teacher education, strengthening induction programs for novice teachers, and promoting "precision" professional development that integrates disciplinary content, digital/AI competencies, and sustained communities of practice, with systematic follow-up to assess the durability of the effects.

Contribution/Originality: This study contributes to the existing literature by analyzing research on teacher self-efficacy (2015-2025). It offers new insights into the personal and contextual determinants of the construct, characterizing the methodological and instrumental heterogeneity, and enhances understanding of the implications for teacher education, induction programs, and continuous professional development.

1. INTRODUCTION

Teacher self-efficacy, understood from Bandura's Social Cognitive Theory as "the belief in one's capabilities to organize and execute the courses of action required to produce given attainments" (Bandura, 1977), has become a central construct in contemporary educational research. Several studies highlight teachers' self-efficacy's influence on

teachers' professional performance and psychological well-being (Ben Rakaa, Bassiri, & Lotfi, 2024; Cai, Wang, Bi, & Tang, 2022; Ioverno et al., 2024).

Building on the influential conceptual framework proposed by Tschannen-Moran and Hoy (2001), this study defines teacher self-efficacy as teachers' judgments about their capacity to bring about desired outcomes in student engagement and learning, even under challenging conditions. From this framework, three core dimensions emerged: efficacy for student engagement, efficacy for instructional strategies, and efficacy for classroom management. These three dimensions have been widely employed in recent research (Kılınç, Polatcan, Atmaca, & Koşar, 2020; Krasniqi & Ismajli, 2022; Laanani & Fathi, 2024; Zakariya & Adegoke, 2024).

The importance of teacher self-efficacy as a construct is grounded in its predictive capacity. Empirical research demonstrates that teachers with higher levels of self-efficacy report stronger persistence when facing difficulties, adopt innovative pedagogical strategies, and experience lower levels of stress and burnout (Helms-Lorenz & Maulana, 2016). Furthermore, recent studies highlight that self-efficacy plays a mediating role in key processes such as instructional leadership and professional learning (Thien & Liu, 2024), as well as in teacher collaboration, which accounts for nearly 40% of the total variance in self-efficacy (Johari, Saad, & Kasim, 2022).

While there is a general agreement on the relevance of self-efficacy, the literature points to theoretical and methodological tensions that make it difficult to reach a unified definition. For instance, some studies report gender advantages favoring men (Çiftçi & Karadağ, 2019; Guerin et al., 2019), whereas others reveal opposite patterns favoring women (Göldağ, 2020; Martin, Ramirez, Calvo, Muñoz-Martínez, & Sharma, 2021; Rodríguez-Hidalgo et al., 2024). Likewise, the relationship between teaching experience and self-efficacy, traditionally conceived as positive and linear, appears more complex, with configurations that vary depending on the domain of teaching practice (Malakul & Sangkawetai, 2024; Von Knebel, Schroeder, & Bögeholz, 2023).

In addition, theoretical diversification has expanded the perspectives used to analyze the construct. Alongside Bandura (1997), the Theory of Planned Behavior (Ajzen, 1991), Self-Determination Theory Deci and Ryan (1985) and organizational frameworks such as the Job Demands-Resources Theory Wu, Song, Zuo, Zhai, and Zhang (2024) have been integrated. This evolution underscores the need for integrative frameworks capable of explaining how personal and contextual factors interact to shape teacher self-efficacy.

The absence of comprehensive systematic reviews synthesizing this diversity represents a significant gap in the literature. While partial studies exist, there is no overarching analysis that articulates the personal and contextual determinants of teacher self-efficacy or that reconciles contradictory findings. Addressing this gap is crucial, since the implications of the construct go beyond theory to directly inform the design of initial teacher education and continuous professional development programs, domains in which self-efficacy simultaneously operates as a predictor, mediator, and outcome of formative processes.

Consequently, the central purpose of this study is to systematically synthesize the empirical evidence published between 2015 and 2025, specifically on the personal and contextual determinants of teacher self-efficacy among in-service teachers, characterizing the heterogeneity derived from measurement instruments and research designs, and deriving implications for teacher education practice and policy.

This systematic review is guided by the following research question: Which personal and contextual factors are associated with teacher self-efficacy among in-service teachers, and how do these associations vary according to the measurement instruments and methodological designs employed?

To address this question, the review pursues the following objectives.

(a) To map and synthesize the main personal and contextual determinants identified in the literature within the specified period.

(b) To assess the heterogeneity and comparability of the findings based on the instruments and methodological approaches used.

(c) To translate the results into operative recommendations for initial teacher education, induction programs for novice teachers, and ongoing professional development.

2. METHODOLOGY

The methodology was designed with the objective of ensuring transparency, replicability, and comprehensiveness in the identification, selection, and analysis of the scientific literature. Therefore, this systematic review was carried out following the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) statement (Page et al., 2021). The application of this protocol was rigorous to guarantee a thorough inclusion of studies.

In order to gather relevant evidence, the literature search was conducted in two internationally recognized databases: Web of Science (WOS) and Scopus. The selection of these platforms was based on their broad multidisciplinary coverage, their indexing of high-impact journals, and their relevance to the fields of social sciences and education.

The time frame covered the period between 2015 and 2025, with the objective of capturing the most recent and relevant scientific production on teacher self-efficacy in educational contexts.

The search strategy combined keywords in English, using Boolean operators to maximize both sensitivity and specificity of the results. The terms employed were *"teacher self-efficacy" OR "self-efficacy" OR "self-efficacy beliefs" AND "teachers" OR "school teachers" OR "classroom teachers" OR "in-service teachers" AND "secondary education" OR "high school" OR "secondary school."* This combination allowed for the identification of studies addressing teacher self-efficacy under different conceptual nomenclatures and within secondary education contexts. Clearly defined inclusion and exclusion criteria were established for the selection of studies (see Table 1).

Only empirical studies published in peer-reviewed scientific journals were included. Eligible studies had to examine teacher self-efficacy as a primary or secondary variable and be conducted in formal educational contexts with active in-service teachers. In addition, only publications in English that employed quantitative methodology and included a sample of at least 150 participants were considered, in order to ensure the statistical robustness of the findings. By contrast, theoretical reviews without original empirical data, studies focusing exclusively on student self-efficacy, research conducted in non-formal educational contexts, and publications without full-text access were excluded.

The selection process followed the PRISMA flow diagram (see Figure 1) and unfolded in several stages. The initial search yielded a total of 560 records, distributed as 96 articles from Web of Science and 464 from Scopus. After the removal of 13 duplicates using reference management software, 547 unique records remained. A screening of titles and abstracts was then performed, leading to the identification of 189 potentially eligible studies. These were subsequently assessed in full text, of which 181 were successfully retrieved for detailed evaluation. At this stage, eight articles could not be accessed due to availability restrictions. Finally, after applying the inclusion and exclusion criteria rigorously, 123 studies were retained, constituting the final corpus of analysis.

Data extraction was carried out using a standardized matrix designed specifically for this review, enabling the systematic and consistent recording of the main characteristics of each study. Extracted variables included: author(s), year of publication, country or geographic context, participant characteristics, instruments used to measure teacher self-efficacy, methodological design, methodological quality, main reported findings, limitations acknowledged by the researchers, and the implications and applications identified for teacher education. This procedure ensured a structured organization of the evidence and allowed for comparative analysis across studies, highlighting convergences, divergences, and research gaps.

In order to synthesize the results, a narrative-descriptive approach was employed. This strategy enabled them to qualitatively connect the results and to situate them within the methodological and conceptual framework of the reviewed studies. In addition, the analysis was summarized in tables, allowing a clearer identification of recurring

patterns, emerging tendencies, and conceptual or methodological inconsistencies across the literature. Together, these procedures offered a nuanced understanding of the current state of knowledge on teacher self-efficacy in the context of secondary education research.

Each identified study was read carefully on at least two occasions to ensure a comprehensive understanding of its content. The relevant information was then organized and registered in a predesigned data extraction matrix. This matrix comprised several key analytical dimensions: bibliographic and publication details (authors, year, and country of origin); study or intervention features (type, objectives, and duration); methodological components (research design, data collection instruments, analytical procedures, and criteria related to validity, reliability, internal consistency, and credibility); and the main findings of each study.

The initial data extraction was carried out by the first author, while the second and third authors conducted an exhaustive verification of each record to ensure accuracy and consistency throughout the process. Any discrepancies were resolved through consensus-based deliberations, thereby strengthening transparency and methodological rigor. Finally, a critical and systematic assessment of the quality of the included articles was conducted to ensure that only the most robust and relevant evidence was incorporated into the integrative analysis of the review.

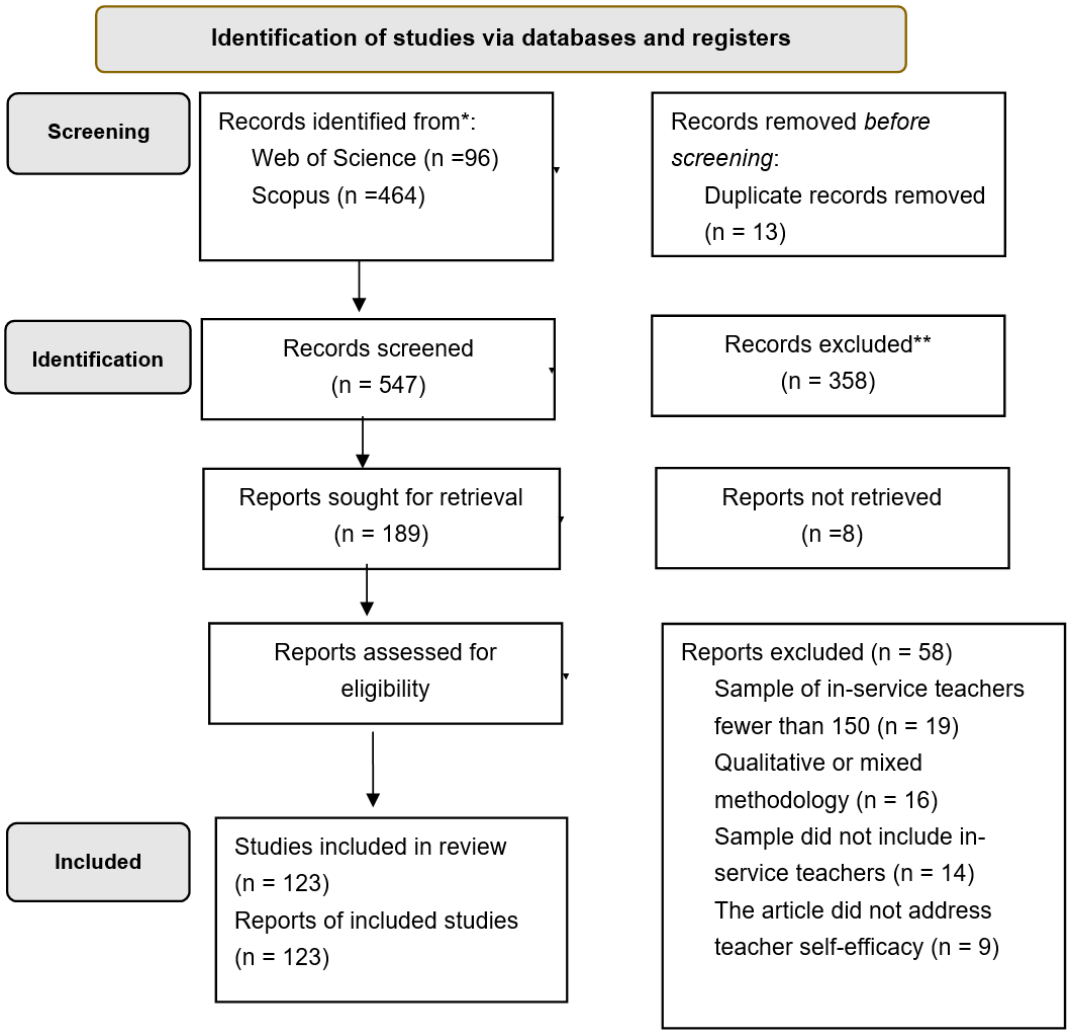

Figure 1. PRISMA flow chart.

3. RESULTS

3.1. Characteristics of Analyzed Studies

The 123 studies included in this systematic review cover a ten-year period (2015–2025) and represent wide geographic diversity, with participation from 41 countries across all continents. The geographic distribution shows

a notable concentration in Asia (n = 58 studies, 47.2%), followed by Europe (n = 38 studies, 30.9%), with significant contributions from countries such as Turkey (n = 17), Indonesia (n = 13), China (n = 9), and Malaysia (n = 10). Oceania and the Americas account for 2.4% (n = 3) and 3.3% (n = 4), respectively, while Africa and the Middle East show more limited representation with 4.9% (n = 6) of the studies. In addition, 8 multinational studies (6.5%) were identified that analyzed data from multiple countries. Notably, Gil-Flores, Rodríguez-Santero, and Ortiz-de-Villate (2024) examined data from TALIS 2018, including 21 countries and a sample of more than 60,000 teachers, while Collie, Granziera, Martin, Burns, and Holliman (2020) analyzed data from eight OECD countries with 14,182 science teachers. Regarding institutional context, public schools predominated (35.8%), although 17.9% of studies examined mixed samples combining public and private institutions, and only 2.4% focused exclusively on private schools. Sample sizes varied considerably, ranging from 150 to 60,000 participants, with a median of 386 teachers per study, reflecting both local research and large-scale international investigations.

Regarding the demographic characteristics of the participants, a clear female predominance was observed in the teaching profession, with women representing approximately 61.2% on average, although this distribution varied by geographic context and educational level. Regarding educational levels, 58.5% of the studies (n = 72) focused exclusively on secondary education, 1.6% (n = 2) on primary education, and 35.8% (n = 44) included mixed samples encompassing both levels. The most represented disciplinary areas were mathematics (27 studies, 22.0%), natural sciences including physics, chemistry, and biology (6 studies, 4.9%), physical education (3 studies, 2.4%), English as a foreign language (5 studies, 4.1%), and integrated STEM disciplines (3 studies, 2.4%). However, a significant proportion of studies (79 investigations, 64.2%) included teachers from multiple specialties without specifying concrete subject areas or without providing detailed information on the disciplines taught. This methodological and contextual diversity underscores the multifaceted nature of research on teacher self-efficacy and makes it possible to identify cross-cutting patterns as well as specific particularities associated with different educational contexts.

3.2. Conceptual Frameworks and Operationalization of Teacher Self-Efficacy

The analysis of the included studies reveals a characteristic pattern in teacher self-efficacy research: apparent theoretical convergence coexisting with substantial operational diversity. Bandura (1977) and Bandura (1997) underpinned 88 studies (71.5%), establishing itself as the dominant framework. Within this group, 40 studies (32.5%) specifically adopted the model of Tschannen-Moran and Hoy (2001). The presence of complementary frameworks adds another layer of complexity to the field. Among the reviewed studies, seven (5.7%) incorporated Ajzen (1991), six (4.9%) applied the Technology Acceptance Model, and two (1.6%) relied on the Conservation of Resources Theory. In some cases, the theoretical scope was expanded through integration: eight studies (6.5%) combined multiple frameworks. For example, Schwab and Alnahdi (2024) linked planned behavior with self-efficacy, while Wu et al. (2024) integrated job demands-resources theory with social learning principles.

Operational diversity was most evidently suggested in the dimensional structures adopted to conceptualize the construct. The three-dimensional model proposed by Tschannen-Moran and Hoy (2001), which distinguishes between instructional strategies, classroom management, and student engagement, was the most frequently applied, appearing in 27 studies (22.0%). Yet, the review showed that radically alternative approaches coexisted. Three studies (2.4%) conceptualized self-efficacy as a unidimensional construct, as in the works of Valckx, Vanderlinde, and Devos (2020) and Çelik and Kahraman (2018). Other 19 studies (15.4%) suggested much more complex multidimensional models: Skaalvik and Skaalvik (2023) identified five dimensions in the Norwegian context; Von Knebel et al. (2023) reported ten factors for interdisciplinary science teaching; Malakul and Sangkawetai (2024) described four domains specific to computer science; and Backers, De Smedt, and Van Keer (2024) defined four dimensions associated with self-regulated learning.

Contextual specificity further deepened this operational fragmentation. A total of 103 studies (83.7%) developed measures for particular domains, with technological or digital self-efficacy being the most frequent. This domain

encompassed 12 studies (9.8%), including Chou, Shen, Shen, and Shen (2024); Howard, Tondeur, Siddiq, and Scherer (2021); Kong, Yang, and Hou (2024); Liu and Liu (2021); Mansour, Said, and Abu-Tineh (2024); Menabò, Sansavini, Brighi, Skrzypiec, and Guarini (2021); Sawiji (2024) and Song and Cheong (2024). Disciplinary self-efficacy represented another specialized focus in 10 studies (8.1%), such as Handtke and Bögeholz (2020) for interdisciplinary science teaching, Şen and Durak (2022) for English teaching, and Sass et al. (2022) for education for sustainable development. Inclusive practices were addressed in six studies (4.9%), notably by Specht, Miesera, Metsala, and McGhie-Richmond (2024) and Martin et al. (2021). Less frequent contexts included multicultural education (Choi & Lee, 2020), educational leadership (Arastaman, Fidan, & Ayyıldız, 2023), and collective teacher efficacy (Mansor, Nasaruddin, & Hamid, 2021; Simonová, Straková, & Greger, 2019; Zakariya, 2020).

Temporal operationalization reflected divergent conceptions of the nature of the construct. The predominance of cross-sectional designs in 72 studies (58.5%) assumes that self-efficacy is sufficiently stable to be captured through single measurements, in contrast with 20 longitudinal studies (16.3%) whose follow-up periods ranged from 10 weeks (Collie, Martin, & Gasevic, 2024) to three years (Helms-Lorenz & Maulana, 2016). Notably, two studies (1.6%) grounded in Conservation of Resources Theory: Cai et al. (2022); Collie et al. (2024); Cosby, Fogarty, and Manning (2023), and Keller-Schneider (2024) explicitly conceptualized self-efficacy as a dynamic attribute subject to contextual fluctuations. Similarly, Uyun (2023) proposed a processual operationalization with three dimensions: magnitude, strength, and generality. Together, these approaches demonstrate that teacher self-efficacy can be examined both as a relatively stable trait through single-point measurements and as a dynamic construct whose manifestation depends on context and the temporal horizon of evaluation.

3.3. Personal Characteristics and Teacher Self-Efficacy

Teacher self-efficacy is largely shaped by individual characteristics, including demographic, psychological, and educational factors. However, empirical findings reveal heterogeneous and, at times, contradictory patterns. Regarding professional experience, multiple studies have documented significant but non-linear effects. Valckx et al. (2020) and Von Knebel et al. (2023) observed that teachers with approximately ten years of experience reported higher levels of self-efficacy, whereas Malakul and Sangkawetai (2024) identified an optimal point between five and nine years, suggesting a curvilinear rather than a strictly progressive relationship.

Conversely, Kazu and Kurtoğlu (2022) and Şen and Durak (2022) found that technological self-efficacy decreases as age or years of service increase, emphasizing that younger teachers tend to exhibit stronger digital competencies. Findings regarding gender are equally variable. Guerin et al. (2019) reported that men expressed greater self-efficacy in teaching occupational safety, whereas Ninković and Knežević-Florić (2018) found no significant differences. More recent studies by Clipa, Delibas, and Mâţă (2023) and Šabić, Baranović, and Rogošić (2022) corroborated significant differences favoring men, although effect sizes were small and moderated by age. These results reinforce the hypothesis that cultural and generational factors mediate the relationship between gender and self-efficacy.

Academic and professional training also emerge as key determinants. Çiftçi and Karadağ (2019) reported that graduates from Faculties of Arts and Sciences displayed higher self-efficacy than those trained in Faculties of Education. In addition, Mansour et al. (2024) reported that obtaining formal teaching certification has a positive effect on different dimensions of technological pedagogical knowledge (TPACK). Consistently, Vidergor (2023) observed that teachers who participate in specialized courses tend to show higher levels of self-efficacy, particularly in relation to instructional strategies and classroom management.

At the psychological and personal level, Aparisi, Granados, Sanmartin, Martínez-Monteagudo, and García-Fernández (2020) showed that emotional intelligence correlates positively with self-efficacy (M = 82.91), while Bobba, Yuksel, and D'Urso (2024) identified a negative relationship with social anxiety (r = −.22), suggesting that internal emotional resources decisively shape perceptions of professional competence. Finally, personality traits and professional attitudes also modulate efficacy beliefs. Collie et al. (2024) found that openness predicts self-efficacy in

the use of generative AI, whereas Arastaman et al. (2023), Çelikkaleli and Ökmen (2021), and Göldağ (2020) highlighted that positive attitudes toward the profession and leadership aspirations are associated with higher levels of self-efficacy. Nevertheless, studies such as Mahmood, Mohamed, Mustafa, and Noor (2021) and Chi-Kin Lee, Wong, and Kong (2021) reported no significant associations with traditional demographic variables, underscoring that these influences are not universal but rather contingent upon specific cultural and organizational contexts. Personal characteristics thus represent relevant yet complex determinants of teacher self-efficacy. Their effects vary depending on the dimension under analysis, the educational context, and their interaction with psychological variables. This complexity calls for nuanced interpretations that move beyond linear explanations.

3.4. Contextual Determinants of Teacher Self-Efficacy

The reviewed literature indicates that teacher self-efficacy is strongly conditioned by contextual factors, which act as either direct predictors or mediators of teachers' efficacy beliefs. One of the most consistent determinants is institutional and social support. Sokha (2024) demonstrated that administrative support operates indirectly by reinforcing disciplinary knowledge, while collegial support exerts a complementary effect. Similarly, Shah and Bhattarai (2023) identified that school management, regular training, and teacher coordination enhance self-efficacy, and Jentsch, Hoferichter, Blömeke, König, and Kaiser (2023) confirmed that social support constitutes a significant predictor of work-related self-efficacy. Additionally, Kosir et al. (2022) found that perceived supervisor support reduces stress levels ($r = -.20$), positively influencing perceptions of teaching competence.

The type of institution is a significant determinant. Comparative studies have shown that teachers working in private or subsidized institutions report higher levels of self-efficacy than their counterparts in public schools (Rodríguez-Hidalgo et al., 2024; Şen & Durak, 2022). This trend is also observed by Martin et al. (2021) when comparing special education with regular education in Chile.

School climate emerges as a robust predictor across different contexts. Zakariya (2020) highlighted that teacher–student relationships explain up to 21% of the variance in classroom management self-efficacy, while Mansor et al. (2021) reported a significant positive correlation ($r = .53$), with the social and academic dimensions of climate explaining 38% of the total variance. Skaalvik and Skaalvik (2023) further documented correlations ranging from .28 to .43 with dimensions of teachers' collective culture. Geographic and socioeconomic contexts also shape self-efficacy. Wang, Tigelaar, and Admiraal (2021) showed that in rural China, work pressure and educational gaps affect perceptions of efficacy regarding the use of digital resources. Asilevi, Havu-Nuutinen, and Kang (2024) found that schools in poverty-stricken areas of Namibia face limited availability of qualified STEM teachers, thereby reducing self-efficacy in this domain. Likewise, Yasin, Kasim, Mustafa, Marhaban, and Komariah (2022) demonstrated that rural teachers in Indonesia exhibit lower familiarity with self-assessment tools, which conditions their perceptions of competence.

Finally, school leadership plays a key role. Thien and Liu (2024) identified a significant linear relationship between instructional leadership and teacher self-efficacy ($\beta = 0.511$, $p < 0.001$), while Khun-Inkeeree, Aziz, Yaakob, Yusof, and Omar-Fauzee (2022) reported that the self-awareness dimension of authentic leadership accounts for 10.4% of the variability in self-efficacy. Similarly, Gümüş, Çağatay Kılınç, and Bellibaş (2022) found that teacher leadership and professional learning together explain nearly one-quarter of the total variance in self-efficacy. These findings suggest that teacher self-efficacy does not rely exclusively on individual factors but is deeply rooted in institutional, socioeconomic, geographic, and leadership conditions, which can either foster or constrain the development of teachers' efficacy beliefs.

3.5. Implications of Self-Efficacy for Teacher Education and Professional Development

The reviewed evidence indicates that teacher self-efficacy functions as a key predictor of teachers' willingness to engage in training activities, the quality of professional learning, and the adoption of innovative pedagogical practices.

Thien and Liu (2024) demonstrated that teachers with high levels of self-efficacy are more inclined to participate in professional development programs and to implement innovative teaching methods, further confirming a mediating role between instructional leadership and professional learning ($\beta = 0.160$, $t = 4.994$, $p < 0.001$). Complementarily, Gümüş et al. (2022) showed that teacher leadership influences self-efficacy both directly and indirectly, mediated by professional teacher learning.

The findings underscore the need for initial teacher education programs to explicitly incorporate the development of self-efficacy as a central objective. Sokha (2024) argued that training should prioritize STEM content activities, as disciplinary knowledge better predicts self-efficacy than collegial support alone. In line with these findings, Lee, Henao, Ko, and Park (2021) emphasized the value of both initial and continuous training programs aimed at developing teachers' personal self-efficacy rather than focusing solely on general teaching competence. Along the same lines, Kong et al. (2024) stressed the need to incorporate elements of artificial intelligence literacy and generative pedagogy tools into teacher education programs.

Continuous professional development emerges as an essential condition for sustaining and strengthening teacher self-efficacy. Aytaç, Alemdar, Akay, and Avcu (2024) emphasized the importance of fostering a culture of lifelong learning through accessible in-service training programs. Wu et al. (2024) proposed "precision" professional development models, stratified and embedded in teacher innovation communities. Jentsch et al. (2023) stressed the relevance of supervised school-based practices that allow the application of diverse teaching methods, while Yilmaz and Aktaş (2023) recommended reorganizing teacher training programs to integrate self-efficacy, emotional intelligence, and teaching styles.

Induction programs for novice teachers emerge as a critical space. Helms-Lorenz and Maulana (2016) demonstrated that induction strengthens the relationship between self-efficacy and reduced job strain, while emphasizing the importance of intensive support during the first five years of teaching. Feng, Helms-Lorenz, Maulana, and Jansen (2021) recommended incorporating self-efficacy diagnostics into induction programs and tailoring support according to motivational profiles.

Taken together, the findings converge on the need to reconceptualize self-efficacy as a central organizing axis of teacher education, both initial and continuous. This entails moving beyond standardized approaches and advancing toward differentiated designs that integrate disciplinary training, digital competencies, cultural sensitivity, and support in the early stages of the career. Self-efficacy should be understood as a dynamic process, constructed across the entire professional trajectory (see Table 1).

Table 1. Training and professional development implications derived from teacher self-efficacy.

Domain	Practical focus	Recommended actions	Authors and Evidence
Initial teacher education	Integrate self-efficacy as an explicit curricular objective	Design mastery experiences and formative self-efficacy assessment within core courses	Gümüş et al. (2022); Kazu and Kurtoğlu (2022); Thien and Liu (2024), and Sokha (2024)
Continuous professional development	Sustained and contextualized approaches	Accessible programs, stratified by levels, with communities of practice.	Aytaç et al. (2024); Jentsch et al. (2023); Rodríguez-Hidalgo et al. (2024) and Wu et al. (2024)
Induction of novice teachers	Consolidate self-efficacy during the first years	Structured mentoring; self-efficacy diagnostics and follow-up at the beginning/end of induction.	Feng et al. (2021); Helms-Lorenz and Maulana (2016) and Valckx et al. (2020)
Digital competencies/AI	Technological self-efficacy and AI literacy	Curricula including TPACK, generative AI, and pedagogy of digital tools; technical-pedagogical support.	Abdullah, Puad, Murad, and Marlisah (2025); Kong et al. (2024) and Kosir et al. (2022)

Domain	Practical focus	Recommended actions	Authors and Evidence
Multiculturalism and inclusion	Efficacy in diverse contexts	Targeted professional development in multicultural education and experiences with diverse populations.	Choi and Lee (2020) and Specht et al. (2024)
Leadership and professional learning	Organizational mechanisms	Strengthen instructional and teacher leadership; professional learning as a mediator.	Gümüş et al. (2022); Thien and Liu (2024) and Simonová et al. (2019)
Self-efficacy assessment/Monitoring	Measure to improve	Use of instruments/diagnostics to identify professional development needs	Çelik and Kahraman (2018) and Sass et al. (2022)
Dosage and intensity of professional development	Effective time thresholds	Minimum of 13–18 hours in co-teaching for tangible improvements in TSES subscales.	Colson, Xiang, and Smothers (2021) and Cosby et al. (2023)
Domain-specific design	Targeted content	Prioritize disciplinary content (e.g., STEM) over general prescriptions.	Sokha (2024) and Von Knebel et al. (2023)
Well-being and attitudes	Psycho-emotional resources	Incorporate emotional intelligence, teaching styles, and strategies to reduce job strain.	Collie et al. (2024); Helms-Lorenz and Maulana (2016) and Yilmaz and Aktaş (2023)

For a better understanding of the overall framework, Table 2 compiles the key quantitative patterns that emerge across the diversity of the study's geographical, theoretical, methodological, and operational dimensions.

Table 2. Synthesis of key quantitative patterns in teacher self-efficacy research (2015-2025).

Dimension	Key Pattern	n (%)
Geographic concentration	Asia and Europe	96 (78.1%)
Theoretical grounding	Bandura's social cognitive theory	88 (71.5%)
Methodological design	Cross-sectional studies	72 (58.5%)
Operational diversity	Domain-specific measures	103 (83.7%)
Standard structure adoption	Three-dimensional model	27 (22.0%)
Sample size	Median: 386 teachers (Range: 150-60,000)	—
Longitudinal research	Studies with temporal follow-up	20 (16.3%)

4. DISCUSSION

The systematic review revealed a coexistence of dominant theoretical frameworks, primarily Bandura's Social Cognitive Theory and the Tschannen-Moran and Hoy (2001) approach (2001). However, it showed a wide diversity of operationalizations, including unidimensional, bidimensional, and tridimensional structures. This aligns with recent research on teacher self-efficacy, where the heterogeneity of scales and factorial structures (e.g., bifactor/ESEM solutions, alternative versions of the TSES, and cross-instrument comparisons) complicates comparability across studies and limits the feasibility of consistent meta-analyses (Gálvez-Nieto, Salvo-Garrido, Domínguez-Lara, Polanco-Levicán, & Mieres-Chacaltana, 2023; Ma, Luo, Cavanagh, Dong, & Sun, 2023; Tournaki, Woodcock, & Ehrich, 2024).

These findings address key gaps identified in the introduction concerning the lack of a comprehensive synthesis capable of reconciling contradictory patterns in the existing literature. Unlike earlier partial reviews that focused on specific domains, this systematic review offers an integrative overview encompassing multiple theoretical frameworks, geographical contexts, and operational definitions. The heterogeneity documented here, particularly regarding dimensional structures and domain-specific measures, helps explain why previous attempts at quantitative synthesis

have faced methodological challenges. Our analysis suggests that such diversity is not merely a technical limitation but reflects substantive differences in how self-efficacy manifests across educational contexts, disciplines, and cultural settings.

The contextual determinants identified in this review, most notably instructional leadership, school climate, and organizational support, both corroborate and extend findings from recent meta-analyses. While Duan, Bissaker, and Xu (2024) quantified effect sizes for 22 correlated classroom management self-efficacy, our synthesis shows that these associations operate consistently across diverse international contexts, recommending a level of generalizability beyond single-nation studies. Similarly, the documented influence of school climate on self-efficacy aligns with longitudinal evidence (Finch, Akhavein, Patwardhan, & Clark, 2023) while adding nuance regarding which specific dimensions of climate, such as teacher-student relationships and collaborative culture, exert the strongest effect.

In the technological domain in particular, evidence on teacher self-efficacy related to the integration of new competencies has shown sustained growth recently, though persistent methodological limitations remain. Similar to findings within the TPACK framework, many studies lack systematic reporting of reliability, cross-validation, and the use of longitudinal designs. Recent investigations have underscored that even in professional development or school leadership contexts, positive outcomes for self-efficacy are primarily based on cross-sectional studies, thereby restricting the capacity to establish robust causal relationships (Acosta & Navarro-Ibáñez, 2025; Jensen, Solheim, & Olsen, 2025; Membiela, Acosta, & González, 2025; Zhou, Shu, Xu, & Padrón, 2023). This observation is consistent with the findings of the present review, which revealed limited standardization in measurement and a heavy reliance on non-experimental designs.

On the other hand, contextual determinants such as leadership and school climate significantly influence teacher self-efficacy, as supported by recent research. For example, a recent study on instructional school leadership found that this type of leadership is positively associated with teacher self-efficacy, acting indirectly through school-level factors such as goal clarity, teacher collaboration, and organizational support (Elfira et al., 2024). Similarly, studies focusing on school climate have shown that positive perceptions of climate predict variations in teacher self-efficacy over time, even in longitudinal models (Finch et al., 2023). This evidence strengthens the finding that organizational infrastructure and the school environment constitute critical levers of the self-efficacy construct, beyond individual variables.

Regarding personal determinants, the findings of this study challenge traditional linear interpretations. The evidence drawn from several studies in the analyzed corpus reveals a nonlinear relationship between teaching experience and self-efficacy, questioning the assumption of steady and continuous growth. The pattern suggests that self-efficacy trajectories are more complex than previously understood, with critical periods (five to ten years) of professional practice when efficacy beliefs often reach their highest point before leveling off or declining. These insights are relevant for determining both the timing and the design of professional development initiatives, as discussed in the recommendations concerning teacher induction programs.

Equally relevant is the link that recent meta-analyses have established between teacher self-efficacy for classroom management and its correlates. A meta-analysis covering two decades identified 22 correlates of classroom management self-efficacy and estimated the effect sizes of these relationships, grouping them into teacher-, classroom-, and school-level factors (Duan et al., 2024). This quantitative reference complements the descriptive evidence synthesized in this review, which highlights consistent associations between instructional leadership and self-efficacy (Thien & Liu, 2024) as well as the effects of school climate (teacher–student relationships, organizational support, and collaborative culture) on efficacy perceptions (Mansor et al., 2021; Skaalvik & Skaalvik, 2023; Zakariya, 2020). At the individual level, non-linear patterns are observed in the relationship between professional experience and self-efficacy (Malakul & Sangkawetai, 2024; Valckx et al., 2020; Von Knebel et al., 2023) along with associations between emotional resources (e.g., higher emotional intelligence and lower social anxiety) and higher levels of self-efficacy (Aparisi et al., 2020; Bobba et al., 2024). Taken together, this body of evidence converges on the conclusion that

teacher self-efficacy is shaped by both personal and contextual determinants, and that its correlates exhibit association magnitudes that can be estimated and compared when quantitative syntheses are available.

The research synthesis on interventions presented here complements and contextualizes the recent meta-analysis by Täschner, Dicke, Reinhold, and Holzberger (2025), which reported overall positive effects of professional development on teacher self-efficacy. Our review builds on these findings by identifying specific program characteristics associated with effectiveness, such as coherence, duration, and active learning, and by documenting substantial variations across different contexts. This contextualization is crucial for translating meta-analytic evidence into actionable policy insights that consider local conditions, resource availability, and cultural factors.

Regarding the potential for intervention to strengthen teacher self-efficacy, the synthesis by Täschner et al. (2025) showed that interventions produce a positive and significant average effect on self-efficacy, albeit with heterogeneity across programs and contexts. Consequently, it is recommended that professional development be designed with explicit quality criteria (coherence, sufficient duration, and active learning), adapted to the context, and implemented with longitudinal evaluation in order to estimate the sustainability of changes and their mediating pathways toward teaching practice and student outcomes.

5. LIMITATIONS

This review focused on articles published between 2015 and 2025, retrieved from two leading international databases (WOS and Scopus), and written in English. While this scope was consistent with the aim of ensuring quality and traceability, it also meant that other sources, languages, and publication formats, such as book chapters or doctoral dissertations, were not included. Moreover, the inclusion criteria prioritized quantitative studies with large samples, thereby limiting the incorporation of qualitative, mixed-methods, or smaller-scale investigations that could have provided complementary perspectives. The classification of approaches and instruments was not always straightforward, given the complexity and diversity in the operationalization of teacher self-efficacy, which led to the decision to adopt a narrative synthesis. Despite these limitations, the analysis provides a robust and representative overview of recent trends in the study of teacher self-efficacy.

6. CONCLUSIONS

Teacher self-efficacy is a key construct; however, its heterogeneous measurement (through divergent models and scales) hinders rigorous comparisons and limits the feasibility of robust meta-analyses. Contextual determinants (e.g., instructional leadership, school climate) and personal factors (e.g., experience, emotional resources) show consistent associations with self-efficacy and help explain variability across studies. The predominance of cross-sectional designs restricts causal inferences; thus, longitudinal and multilevel approaches are needed, together with standardization and comprehensive reporting of validity and reliability. Evidence on professional development suggests positive effects on self-efficacy when programs are coherent, of sufficient duration, and include active learning, although outcomes remain context-dependent and require follow-up evaluation. Overall, the findings recommend the following: (a) harmonizing instruments and reporting practices, (b) broadening geographic and contextual diversity, and (c) aligning teacher education with disciplinary and organizational needs while incorporating technological components where appropriate.

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