



Comparative Paradigms in Early Childhood Educator Professional Development: Systematic Review and Implications for Indonesia

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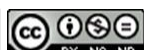
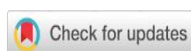
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ABSTRACT

This study explores different methods of the professional development (PD) of early childhood educators (ECEs) across various countries and assesses their relevance for Indonesia. Guided by PRISMA, a systematic review synthesizes 20 international and national publications from 2014 to 2025. Four main themes emerged: global trends in ECE teacher professionalism, PD models and strategies, shifts toward transformative approaches, and contextual implications for Indonesia. The findings indicate that effective PD worldwide emphasizes ongoing coaching, collaborative learning communities, reflective practices, and the integration of digital technologies. Countries such as Finland, Singapore, Japan, Canada, and Kenya show strong systemic links between policy frameworks, teacher induction, continuous professional development, and career pathways. Based on these insights, Indonesia could adopt a hybrid model that combines top-down policy support with bottom-up, teacher-led initiatives, supported by digital platforms, professional learning networks, and child-centered reflective practices. The study underscores the importance of coherent policy design, equitable access to PD, and structured career pathways in enhancing ECE teacher professionalism. Future research should use empirical methods to evaluate hybrid PD models and examine their long-term impact on teaching quality and child outcomes.



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INTRODUCTION

The professionalism and continuous skill development of early childhood educators strongly influence the quality of early childhood education (ECE). In many countries, rapid changes in curriculum demands, increasing expectations for child outcomes, and the integration of digital technologies require ECE teachers to engage in ongoing professional development (PD). However, in Indonesia, PD practices for ECE teachers remain fragmented, vary widely across regions, and are often limited to short-term training programmes. This situation creates a gap between policy expectations and teachers' professional competencies, highlighting the need to explore more effective and sustainable PD paradigms.

Professional development for early childhood education (ECE) teachers has been conceptualized in various ways. Scholars categorize PD into formal education, credentialing, in-service training, coaching, and communities of practice (Dyment et al., 2014). Skills and proficiency in integrating technological innovations into the learning process (Ikbal, 2018). Kennedy (2005) further classifies PD models along a continuum from traditional to transformative, including training, mentoring, action research, and collaborative community

practice. Recent studies argue that hybrid approaches combining workshops, classroom coaching, peer learning, and reflective practice yield stronger outcomes than single-method models (Arikan et al., 2017; Schachter et al., 2019; Williams et al., 2022). Although these frameworks provide valuable insights, most reviews discuss PD models within a single national context or focus only on specific PD strategies, leaving limited understanding of how broader paradigms differ across countries.

A comparative perspective is essential for understanding how different national policies, professional cultures, and systemic structures influence the development of early childhood education (ECE) teachers. Countries such as Finland, New Zealand, Singapore, Japan, and the United States showcase diverse approaches – from collaborative teacher learning communities to structured induction programs and policy-driven certification pathways (Lee, 2024; Page & Waniganayake, 2019). These variations indicate that no single professional development (PD) model is effective everywhere; instead, success depends on how well policies, standards, and school practices align. Despite increasing research, a significant gap remains: few comparative analyses systematically map global PD models and evaluate their relevance for Indonesia. Most existing studies focus on isolated PD strategies rather than examining how countries integrate policies, systems, and professional cultures into unified frameworks.

RESEARCH METHOD

This study employed a systematic literature review approach designed to synthesize international and national research on the professional development of Early Childhood Education (ECE) teachers. Analyzing various academic articles from reputable international and national journals. The analysis involved synthesizing the findings, starting with the identification of main themes, then comparing practices across different countries, and finally relating them to the Indonesian context. Data sources are obtained from publications indexed in well-known international databases such as Scopus, Web of Science, Taylor & Francis, Springer, Sage, and Elsevier, as well as policy reports from global institutions including UNESCO and the OECD. The selection of literature is based on three inclusion criteria: (1) articles that explicitly discuss the professional development of early childhood educators; (2) published between 2005 and 2023 to ensure current data; and (3) published in reputable international journals or widely recognized policy reports. The data collection process was conducted through a desk review. The steps included (a) searching databases using keywords such as early childhood education, professional development, teacher professionalism, and ECEC policy and (b) selecting literature based on the inclusion-exclusion criteria. The chosen literature was then analyzed using a qualitative-descriptive approach to identify general patterns, trends, and gaps in the professional development practices of ECE teachers at both the global and national levels. The review process consists of four main stages: identification, screening, eligibility assessment, and inclusion. This process was adapted from the PRISMA (Preferred Reporting Items for Systematic Reviews and Meta-Analyses) framework.

The literature was searched in major international databases—Scopus, Web of Science, Taylor & Francis, Springer, SAGE, and Elsevier – along with policy repositories such as UNESCO and the OECD. The search took place from January to March 2024. Four main search strings were used, combined with Boolean operators: “early childhood education” AND “professional development”; “ECE teacher professionalism” OR “teacher competency development”; “ECEC policy” AND “professional learning”; “early childhood educators” AND (“training” OR “coaching” OR “career pathway”). Search strings were adjusted for each database to maintain an equivalent scope.

To ensure consistency and relevance, the following inclusion criteria were applied: Articles explicitly discussing the professional development or professionalism of ECE teachers; Empirical studies, policy analyses, or systematic reviews; Published between 2014 and 2025; published in reputable peer-reviewed journals or globally recognized policy reports; Written in English.

Exclusion criteria included: Articles focusing on K-12 or higher-education teachers; Opinion pieces, editorials, conference abstracts without full papers; Publications without accessible full text; studies unrelated to PD frameworks, teacher professionalism, or ECEC systems.

The screening process followed four PRISMA stages: Identification: 233 records were retrieved from all databases; Screening: After removing 33 duplicates, 200 titles and abstracts were screened; Eligibility: 70 full-text articles were assessed based on inclusion–exclusion criteria; Final inclusion: 20 articles (13 international, 7 national) met all criteria and were included in the final synthesis. Reasons for exclusion during full-text review included not being focused on ECE teacher professional development (n=28), insufficient methodological detail (n=13), and context not being comparable with ECE systems (n=10).

Data analysis followed a three-step process: open coding and theme extraction. An inductive coding approach was used to derive themes from the included studies. Codes were grouped into categories representing PD models, policy structures, teacher competencies, and systemic supports. During axial comparison across contexts, themes were compared across countries to identify similarities, differences, and systemic patterns. International and national studies were weighted equally to prevent geographical bias. For the Indonesian context, interpretative synthesis was conducted to evaluate the applicability within Indonesia’s policy and institutional environment.

Two reviewers independently coded all included articles. Coding disagreements (12%) were discussed and resolved until full agreement was achieved. Quality appraisal used a combined PRISMA–CASP checklist to assess methodological rigor, clarity of PD frameworks, and contextual relevance. Only studies meeting minimum quality thresholds were included.

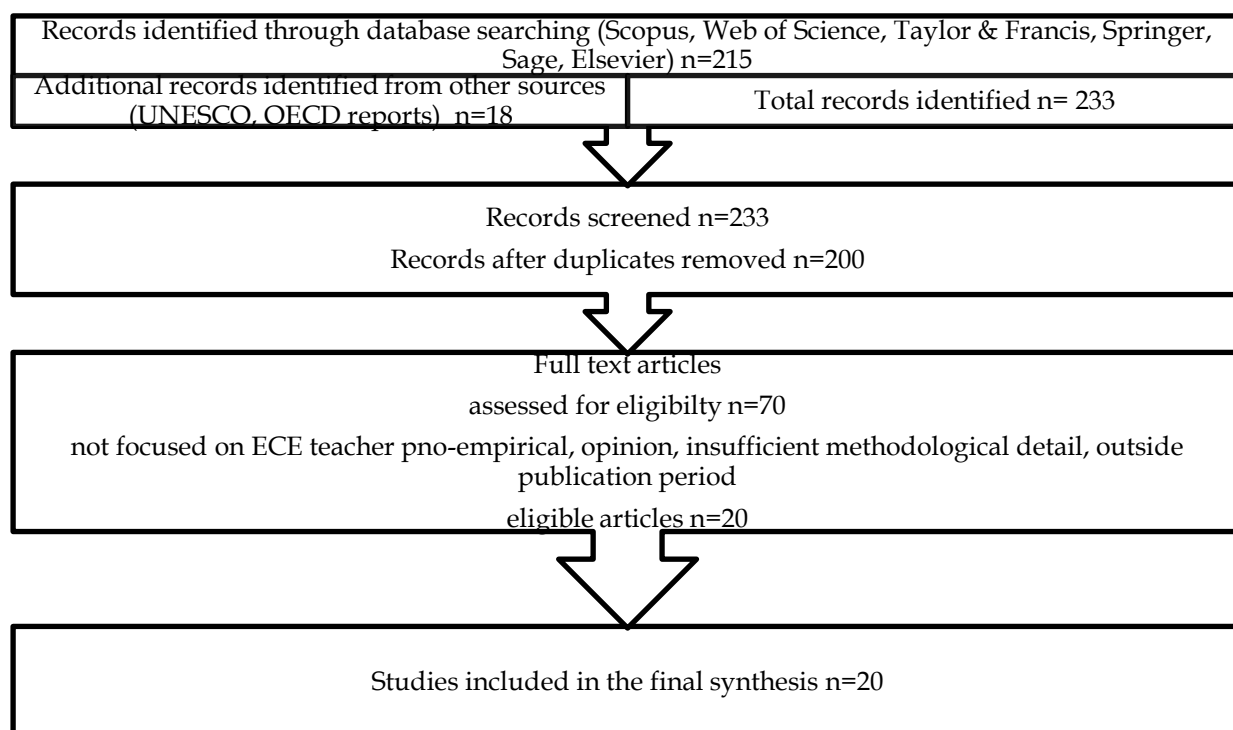


Figure 1. Research method

RESULTS AND DISCUSSION

Systematic Literature Review

Professional development (PD) for early childhood educators (ECEs) has garnered increasing attention over the past twenty years due to its crucial role in enhancing learning practices and child development outcomes. Several meta-analyses and systematic reviews confirm that PD, which is sustainable, intensive, and tailored to the context, is associated with higher teacher

competence and improved interactions between teachers and children (Brunsek, 2020; Deding & Minnaert, 2024).

Table 1. Thematic focus of the professionalism development paradigm

Thematic Focus	Result
Strengthening teachers' core competencies	Professional development programs, both in-service and pre-service, consistently improve pedagogical knowledge, interaction skills, and the quality of classroom practice (Dyment et al., 2014; Fukkink et al., 2019).
Educational leadership	Visionary leadership is crucial for tackling the complexity of the early childhood education sector, ensuring sustainable professional development, and fostering a professional learning culture within institutions (Page & Waniganayake, 2019).
Context-based and collaborative training	Educational institutions operate as professional learning ecosystems through collaboration, reflection, and networking among teachers (Lino, 2014; Catch & Grains et al., 2017).
Teacher performance assessment	Performance assessment serves not only for formal evaluation but also as a reflection tool that promotes the improvement of teaching quality (Khan, 2015).
Technology integration	The development of teachers' digital literacy becomes a crucial necessity, especially through professional development that includes learning technology and digital adaptation. (Arıkan et al., 2017; Granor et al., 2016)
Specific Areas of Learning	PD that focuses on specific fields, such as STEM or the arts, has been shown to improve the quality of planning, implementation of activities, and children's learning outcomes (Gardner et al., 2019; MacDonald et al., 2020; Hayes et al., 2021).
Ecology of teacher learning	Teachers learn through various formal and informal opportunities (coaching, practice communities, self-reflection), so professional development must be multimodal and ongoing (Fernández March, 2020; Souto-Seijo et al., 2021).
The relationship between PD experience and teaching practice	PD experience has a direct impact on teachers' pedagogical beliefs and classroom teaching practices, especially in enhancing interaction sensitivity and the effectiveness of teaching strategies (Gardner-Neblett et al., 2021).

The range of PD strategies encompasses traditional methods, such as face-to-face training and certification, as well as innovative approaches, including coaching, mentoring, action research, and community-based learning. Coaching, in particular, consistently demonstrates the ability to improve teaching practices, and according to multiple studies, it also has a positive impact on children's learning outcomes. (Yang, 2022) The SCOPE study (ACF, 2020) even highlights variations in coaching methods within early childhood education across different settings, emphasizing the importance of intensity, relationships, and content focus. Furthermore, peer collaboration through peer counselling or teacher communities has been shown to strengthen professional identity and support ongoing learning for educators. (Fimreite & Glosvik, 2024; Lee, 2024).

Table 2. Variations of models and strategies for developing professionalism

Model	Result
Ecological and learning community models	Emphasizing the importance of inter-stakeholder cooperation, collective reflective practices, and institutional support that encourages continuous learning.

Model	Result
Performance appraisal model	It provides opportunities for teachers to develop competencies through evaluation, but also has the potential to cause psychological pressure if it is only oriented to summative assessment.
Industrial and technology-based models	Integrating the involvement of professional practitioners from outside the world of education to strengthen the technical skills and specialization of teachers according to the needs of the field.
Specific discipline model (STEM, arts, sustainability)	Providing thematic training focused on specific areas so as to expand pedagogical insights and encourage creativity in early childhood education practice.
Pre-post vs in-service model	Confirms the existence of a difference in strategy: pre-employment training is effective in building a foundation of basic skills, while in-service training is more relevant in maintaining and updating practice on an ongoing basis.

Globally, the success of professional development models depends on how well policies, work culture, and institutional support are aligned. Countries with collaborative education systems, such as Finland and New Zealand, have successfully implemented learning communities because teachers have enough autonomy and time for reflection. Conversely, in settings with high bureaucracy or a heavy teacher-student ratio, this model is less effective. Performance appraisal models work best in systems that focus on formative assessment, like Japan, but tend to be ineffective in countries that primarily rely on summative evaluation to measure quality. Similarly, technology and industry models perform better in countries with advanced digital infrastructure; Indonesian research (Sukini et al., 2024) highlights this. Additionally, issues related to inclusion, multiculturalism, and teachers' emotional well-being encourage the development of a more comprehensive PD approach, emphasizing practical reflection, professional mentoring, and the social-emotional skills of educators (Berger et al., 2022; Damiani et al., 2024). The effectiveness of blended learning has been demonstrated, but implementation often faces challenges related to equitable internet access. In discipline-based professional development, countries such as Australia succeed due to strong support for the national curriculum. However, many developing countries still require ongoing training and supervision to make this model work effectively. Lastly, comparing pre-service and in-service training shows that countries with structured induction programs (e.g., Singapore, Canada) consistently align the two, whereas others often experience gaps between initial training and practical application in the field.

Table 3. Implications of developing professionalism in early childhood education teachers moving in a transformative direction

Key Focus	Findings	Implication
The relationship between teacher PD and children's outcomes (Brunsek,et.al., 2020)	Studies show that PD initiatives consistently improve the quality of teachers' teaching practices, although the direct impact on child development is not always uniform.	An intensive and continuous PD program is needed, with <i>coaching</i> as an approach to strengthen effectiveness.
PD that targets classroom practice (Obee, 2022)	The results of the study confirm that PD becomes more meaningful when implemented in a classroom context, is reflective, and encourages cooperation between educators.	The PD model should be directed to real practice in the classroom, not just momentary training activities or <i>one-shot workshops</i> .
The effect of coaching on teachers and children (Yang, 2022)	<i>Coaching</i> has been proven to improve the quality of teacher instruction, and there are indications of its contribution to improving children's learning outcomes.	<i>Coaching</i> and <i>mentoring</i> should be placed as core components of the PD design of ECE teachers.

Key Focus	Findings	Implication
PD in play-based learning (Lee et al., 2024)	Various forms of PD—such as workshops, <i>coaching</i> , and community of practice—have been used, but their ultimate success is largely determined by the topic's linkage to the curriculum and the needs of teachers.	PD design needs to adapt to the theme or focus of learning, especially for play-based approaches.
Implementation of coaching in ECE (Scope et al., 2020)	Studies show that there are variations in the form of <i>coaching</i> , with effectiveness greatly influenced by the quality of the relationship between coaches and teachers, as well as the observation and feedback processes provided.	Providing practical direction for PAUD institutions in implementing <i>the coaching</i> model according to local needs.
PD Teachers in-service (Makhmetova et al., 2025)	Crucial factors for PD success for teachers who are already teaching include peer collaboration, ongoing mentoring, and the application of practices supported by scientific evidence.	The PD program needs to be based on collaboration and research, so that teachers can continue to update their competencies according to the development of knowledge.
The relevance of the Kennedy model in the digital age(Williams et al., 2022)	While the Kennedy model remains relevant, its implementation requires modifications to align with the needs of digital-based and <i>blended learning PD</i> .	The integration of online platforms and hybrid approaches must be prioritized to address the challenges of 21st century education.

The experiences of various countries demonstrate that the integration of policy primarily determines the success of professional development for early childhood education teachers, the continuity of the system, and the provision of reflective and collaborative support at the practical level. In the Indonesian context, learning from international practices can be adapted to strengthen the quality of early childhood education by emphasizing a combination of *top-down* and *bottom-up* approaches. The transformative direction in the professional development of early childhood education teachers does not come from free interpretation but is directly identified from the pattern of findings in the analyzed studies, namely: a shift in focus from one-way training to coaching, reflection, and collaboration (Obbe, 2022; Scope et al., 2020; Yang, 2022); evidence of successful contextual practice based on classroom implementation confirms that transformation occurs when teachers are connected to real practice; a shift from traditional models to hybrid-digital models as outlined by Williams et al. (2022); internalization of evidence-based practices (Makhmetova et al., 2025) plays a role in changing teachers' pedagogical beliefs.

Table 4. International findings: Relevance to the Indonesian context

Context	Information
Systemic integration	Indonesia needs to integrate recruitment processes, induction programs, continuous professional development (CPD), and teacher career paths so that professional development is consistent and sustainable.
Child-based reflection	The approach applied in Japan can be adapted to enrich the PKB activities of early childhood education teachers through deep reflection on children's learning experiences and their developmental stages.
Utilization of digital technology	The Kenyan model shows the potential of using online platforms at affordable costs to expand access to CPD, especially for teachers in hard-to-reach 3T regions.
Teacher community	Following the practice in Canada and Australia, strengthening teacher learning communities can open up space for cross-regional and cross-cultural collaboration, thereby encouraging the exchange of good practices.

Context	Information
Career incentives	Singapore's experience shows that tiered career paths, complemented by functional as well as financial rewards, are effective in motivating teachers to improve their competencies.

Based on the analysis of 20 main articles, the international findings presented in Table 4 indicate that relevance to the Indonesian context mainly resides in how systemic elements, reflective practices, technology, professional communities, and career incentives can be adapted to address national needs. This analysis confirms that Indonesia requires a contextual approach that integrates international practices with local challenges, including disparities in the quality of early childhood education across regions, limited access to continuous professional development (CPD), and the lack of integration within teacher career policies. A comprehensive integration of teacher recruitment, induction, CPD, and career pathways—similar to models implemented in Singapore and Japan—can enhance the consistency of professional development for early childhood educators. Furthermore, practices such as child development-based reflection, low-cost digital models exemplified by Kenya, and the strengthening of teacher learning communities, as demonstrated in Canada–Australia, can serve as pragmatic strategies for Indonesia to progressively improve the quality of early childhood education.

Discussion

Global Theme of Enhancing Professionalism Among Early Childhood Education Teachers

The findings of this study indicated that the professional development of early childhood educators cannot be understood as a single or linear process but rather as a complex ecosystem influenced by multiple antecedent variables that interact with one another. The four thematic focuses identified, namely, global themes, development models and strategies, transformative paradigm shifts, and the relevance of the Indonesian context, represent the conceptual, structural, and contextual dimensions of the professionalization process of early childhood education teachers. Conceptually, the global theme serves as a normative foundation that frames the direction of teacher professionalism development universally. Global trends, such as continuous professional development (CPD), reflective practice, and teacher learning communities, have become a reference for many countries in developing competency standards and teacher training systems. This theme serves as a macro antecedent variable that influences the formulation of national policies and institutional strategies at the micro level.

Professional development (PD) for early childhood educators (ECEs) plays a crucial role in enhancing teaching practices and promoting positive child developmental outcomes. Table 1 reinforces this by outlining seven key thematic areas within the framework of teacher professional development. Each theme reflects an essential aspect of a sustainable, contextual, and collaborative PD strategy, as highlighted in the international literature. The results of international studies indicate that developing teacher professionalism emphasizes lifelong learning, practical reflection, and improving educational quality. CPD is viewed as the primary framework for professional development. Over the past twenty years, efforts to build the professional capacity of early childhood education teachers have significantly increased. Several meta-analyses confirm that coaching initiatives that are sustainable, intensive, and tailored to the context can improve educators' skills and their interactions with children. Global practices typically emphasize principles (Brunsek, 2020; Deding & Minnaert, 2024), such as lifelong learning, critical reflection, and pedagogical innovation, as vital. Darling-Hammond (2017) highlights the importance of systemic integration, including recruitment, initial training, induction, and ongoing career development. Meanwhile, Srinivasacharlu (2019) points out that CPD helps strengthen educators' cognitive, affective, and psychomotor domains.

Models and Strategies for Cultivating Early Childhood Teacher Professionalism

Based on the result shown in table 2 about variations of models and strategies for developing professionalism, the ecological and learning community model highlights collaboration, reflection, and organizational support, aligning with the concept of professional learning communities (Lee et al., 2024). Meanwhile, the performance appraisal model provides teachers with an opportunity to receive constructive feedback, although it can be stressful when it focuses solely on the summative aspect. (Deding & Minnaert, 2024). Some countries that have implemented models and strategies for developing the professionalism of early childhood teachers include (1) Darling-Hammond (2017): It shows that the teacher professionalism development system in Finland, Canada, Australia, and Singapore is built in an integrated way with the components of recruitment, preparation, induction, CPD (Continuing Professional Development), and career paths. These findings underscore the importance of aligning these components to ensure the system remains balanced. (2) Srinivasacharlu (2019): Emphasizes the urgency of Continuing Professional Development (CPD) as a form of lifelong learning for educators. CPD helps strengthen educators' cognitive, affective, and psychomotor skills. (3) Bett & Makewa (2020): Demonstrates the potential of social media (Facebook groups) as an alternative approach for CPD. Teachers can interact informally, which has a direct impact on their learning practices. (4) Tyagi & Misra (2021): Highlights two paths of PKB, namely (a) structured programs from external institutions and (b) teachers' independent initiatives. Challenges occur when capacity, motivation, or structural support are lacking.

The global pattern of professional development of early childhood education teachers is divided into (1) Formal models: Finland and Singapore emphasize rigorous initial preparation, systematic induction, and tiered career paths. (2) Collaborative model: Canada and Australia prioritize mentoring, teamwork, and reflection based on *school partnerships*. (3) Alternative models: Kenya offers a digital community-based approach (Facebook), which could be applied to resource-constrained countries. (4) Reflective practice: Japanese early childhood teachers use child-voice-based reflection in teacher conferences, which deepens understanding of children's diversity and improves the quality of teacher-child interaction.

On the other hand, industry- and technology-based models demonstrate the importance of the interconnectedness between the world of education and the world of work and technological developments, which are relevant to the demands of 21st-century skills. Specialized discipline models, such as STEM, arts, or sustainability, provide space for educators to enrich theme-based learning practices, according to the needs of children and the demands of the curriculum (Kewalramani et al., 2025; Sukini et al., 2024). The difference between the pre-tenure and in-office models highlights the need for coaching strategies that cater to the career phases of teachers, from pre-tenure to develop foundational competencies and from in-office to establish sustainable practices. (Brunsek, 2020; H. Li et al., 2024). In the Indonesian context, these various models can be combined to form a hybrid approach. For example, the teacher learning community can be encouraged through the KKG/PKG forum, while the use of digital technology can support more equitable online training. Thus, the combination of global models and local strategies will strengthen efforts to improve the professionalism of ECE teachers in Indonesia.

Shift Towards a more Transformative Model

The third novelty was about Developing Professionalism in Early Childhood Education Teachers Moving in a Transformative Direction. Indicate that the issue of inclusion and multiculturalism drives a new direction in the development of the professionalism of ECE teachers. PD focused on inclusive practice through coaching and reflection has been shown to strengthen teachers' skills in meeting the needs of children with diverse abilities. Similarly, research on preschool teacher assistants in multicultural contexts found that PD improves self-efficacy and readiness to work in complex classrooms (Damiani et al., 2024). The aspect of teacher welfare is now an equally important dimension. Recent reviews highlight that PD initiatives that also include support for

teacher social-emotional well-being have more potential to be long-lasting and have a positive impact (Kaplan et al., 2025). A recent meta-analysis confirms the close relationship between teachers' social-emotional competence and classroom management, the quality of relationships with children, and children's developmental outcomes. (Berger et al., 2022).

Overall, the latest evidence confirms that effective early childhood education is sustainable, practice-based, collaborative, and responsive to local and global needs. A variety of models ranging from coaching and community of practice to blended learning and topic-specific programs (e.g., play pedagogy or inclusivity) suggest that no single approach is universally applicable. On the other hand, a flexible, contextual, and student-centered PD design that prioritizes the welfare of teachers and the needs of children will further ensure the success of the PAUD program in the future. These various studies suggest that the effectiveness of professional development for ECE teachers is not only determined by the existence of the program but also by its strategy, relevance, and quality of implementation (Faizin et al., 2024; Karabay & Aras, 2025; X. Li et al., 2024).

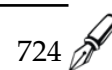
Coaching and *mentoring* consistently emerge as the most impactful approaches, both in enhancing teachers' instructional skills and contributing to children's academic achievements. In addition, contextual PD – that is, one that takes place in the classroom, emphasizes reflection, and is collaborative – tends to be more effective than short training that is disconnected from daily practice. The changing global education landscape also underscores the importance of digital adaptation. Classical PD models, such as those offered by Kennedy, remain relevant but require updating to fit the needs of teachers in the era of *blended learning* (Halle et al., 2025). For Indonesia, these findings signal the need for a PD strategy that combines the sustainability of national policies with local innovation, primarily through the use of digital technology that can reach teachers in various regions.

Relevance for Indonesia in the Development of Professionalism of Early Childhood Education Teachers

The experiences of various countries demonstrate that the integration of policy primarily determines the success of professional development for early childhood education teachers, the continuity of the system, and the provision of reflective and collaborative support at the practical level. In the Indonesian context, learning from international practices can be adapted to strengthen the quality of early childhood education by emphasizing a combination of *top-down* and *bottom-up* approaches (Bautista et al., 2023; Istiana, 2024). In terms of policy (*top-down*), Indonesia already has a regulatory framework in place, including educator certification, induction programs, and sustainable professional development. However, the effectiveness of these policies is often limited by inconsistencies in implementation, regional disparities, and limited access in remote areas (Deding & Minnaert, 2024; Dinler & Cevher-Kalburan, 2025; Kamil et al., 2023). Therefore, policies need to be synergized with a bottom-up approach that provides space for teachers to build learning communities, conduct reflections based on their teaching experiences, and utilize digital technology as a medium for self-development.

Practices in several countries can be used as inspiration. Singapore, for example, emphasizes tiered career paths to motivate teachers. Canada and Australia are developing teacher communities as a means of exchanging best practices. Japan emphasizes voice-based reflection for children. Meanwhile, Kenya demonstrates how the use of social media can serve as an alternative, cost-effective, and accessible CPD platform. The adaptation of these elements in Indonesia enables the development of a professional development model that is contextual, inclusive, and tailored to the needs of teachers and early childhood students.

Relevance to the Indonesian context above shows that learning from different countries can provide a crucial foundation for enhancing the professionalism of ECE teachers in Indonesia. Systemic integration is essential to ensure that every stage of a teacher's development is covered. Various types of professional development for early childhood educators are grouped into five



main categories: formal education, credentialing, in-service training, coaching or consultation, and communities of practice. Career progression from recruitment and induction to CPD and promotion progresses in a consistent and mutually supportive manner. Without such continuity, professional development programs may become disjointed and less effective. Additionally, the child-centered reflection approach used in Japan emphasizes the importance of linking teacher development with students' real-life learning experiences. This practice can strengthen PKB in Indonesia, particularly by enhancing teachers' awareness of the developmental needs of young children.

The use of digital technology, as seen in Kenya, is also relevant to Indonesia's geographical conditions. Affordable and accessible online platforms can help bridge the gaps in 3T areas, making equitable access to professional development more feasible. Furthermore, teacher communities established in Canada and Australia underscore the value of cross-regional and cultural collaboration. Such forums enable teachers to exchange best practices and strengthen their professional identities. Singapore's career incentive policies demonstrate that functional and financial rewards must complement intrinsic motivation to sustain teachers' commitment to professional growth.

Research indicates that effective professional development for teachers, including those in ECE, requires a system that integrates recruitment, preparation, induction, and ongoing growth. Finnish and Singaporean models emphasize high-quality initial preparation and structured career paths, whereas Canadian and Australian models prioritize mentoring and school-based collaboration. Alternatively, Kenya's use of social media offers new opportunities for developing countries with limited resources. In Indonesia, enhancing the professionalism of early childhood educators requires a hybrid approach that combines national policy with teacher-led initiatives. Integrating digital technology, forming teaching communities, and offering career incentives are key strategies for effective, equitable, and impactful CPD.

Indonesia can adopt a hybrid model, merging top-down policies (certification, induction, CPD) with bottom-up initiatives (teacher communities, child-based reflection, digital technology). Systemic integration encompassing recruitment, induction, and PKB modelled on Finland and Singapore, along with child voice-based reflection from Japan and cross-cultural teacher communities, can enrich PKB. Adopting Kenya's use of digital technology can lower costs and increase access and participation, particularly in remote regions. Self-directed initiatives should be strengthened through incentives, mentoring, and formal recognition.

Tabel 5. Implications for Indonesia

Key Issue Identified	Implication for Indonesia
The professionalism of early childhood education teachers as a multidimensional ecosystem	Indonesia needs to develop an integrated, non-fragmented PKB system that covers recruitment, induction, continuous professional development (CPD), and a consistent career pathway.
The need for sustainable, collaborative, and reflective PD (global trend)	PKB must shift from one-way training towards community-based collaborative learning (KKG/PKG), practical reflection, and lifelong learning.
International model variations (ecological, appraisal, digital, special discipline, pre/in-service)	Indonesia can implement a hybrid model that combines coaching, learning communities, digital-based training, and discipline-based approaches (STEM, arts, inclusion).
Effectiveness of coaching and mentoring	Coaching needs to be made a core component of PKB, both for new teachers and senior teachers. Local governments and early childhood education institutions need to prepare a systematic mentoring structure.
Paradigm shift towards inclusivity, multiculturalism, and teacher welfare	The PKB must include topics on inclusion, readiness to work in a multicultural classroom, and support for teachers' social-emotional well-being as indicators of professional competence.

Key Issue Identified	Implication for Indonesia
Digitalisation as an opportunity for equal distribution (Kenya's findings and blended learning practices)	Indonesia needs to expand low-cost digital platforms for early childhood education (ECE) teachers' professional development, especially in 3T areas, and strengthen blended learning models to address access disparities.
The importance of the teacher community as a learning ecosystem (Canada, Australia)	The government needs to strengthen KKG/PKG as a cross-regional professional forum and stimulate collaboration through sharing best practices both online and offline.
Child-based reflection (Japanese practice)	Indonesia can enrich PKB with a reflection approach based on children's learning experiences to enhance teachers' sensitivity to children's developmental needs.
Career and incentives (Singapore model)	The career ladder system for early childhood education teachers needs to be clarified and linked with functional and financial incentives to encourage long-term motivation and professional commitment.
The gap in the implementation of national policies	Certification, induction, and collective labour agreement policies need to be strengthened through data-based monitoring, equitable distribution of budgets, and technical support for regions with low capacity.

CONCLUSION

This research confirms that institutional support, system sustainability, and the provision of reflection spaces are fundamental elements that strengthen the ongoing learning process and promote innovation within the context of modern education and organizations. Capacity-building programs for teachers that are practice-oriented, collaborative, and responsive to technological demands and socio-emotional needs have been proven to have a more sustainable impact compared to conventional approaches. In the Indonesian context, various persistent challenges still emerge, including the gap between theory and practice, limited support for teachers in remote areas, and uneven program quality. Therefore, a hybrid model that integrates national policies with local initiatives is required. The integration of certification, Continuing Professional Development (CPD) policies, professional learning communities, reflective practices, and the utilization of digital technology are key strategies to strengthen the professionalism of early childhood education (ECE) teachers. Based on these findings, three strategic recommendations are proposed for Indonesia: harmonizing policies that integrate national standards with local and educational unit needs; strengthening institutions through consistent mentoring mechanisms, developing professional learning communities, and structured reflective practice systems; and implementing capacity development models that incorporate digital tools and hybrid approaches to improve accessibility and sustainability of implementation. By clarifying these strategic directions, Indonesia has the potential to develop a more responsive, equitable, and sustainable professional development system for early childhood educators, thereby directly impacting the quality and achievement of early childhood education services nationwide.

This research has several methodological limitations that should be acknowledged to maintain scientific transparency. First, the number of articles identified and analyzed in this systematic review is relatively small, so the findings do not fully represent the entire body of relevant research in the field of early childhood education teacher professionalism development. Second, the article selection process may be subject to publication bias, as only studies that have been formally published and are available in accessible academic databases are included, while grey literature or unpublished research might be overlooked. Third, relying mainly on English-language databases could introduce language bias, meaning that high-quality research published in Indonesian or other languages might not be included. Fourth, the findings of this study are based solely on literature synthesis without empirical validation through field data, so the

generalizability of the results should be approached with caution. These limitations open opportunities for further research that incorporates empirical data and broadens the literature scope to develop a more comprehensive and representative understanding.

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