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Inclusive Education for Children with Special Needs in Early Childhood Education: A Literature Review on Teaching Strategies, Teacher Support, and the Learning Environment

Ananda Ramadhani

Universitas Negeri Makassar, Makassar, Indonesia

anandaramadhani017@gmail.com

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ABSTRACT

Inclusive education in early childhood settings is essential for ensuring that children with special needs have equitable opportunities to participate, learn, interact, and develop alongside their peers. However, effective inclusion requires more than physical placement in mainstream classrooms; it depends on appropriate instructional strategies, teacher competence and support, and responsive learning environments. This literature review aimed to synthesize recent conceptual and empirical evidence on inclusive education for children with special needs in early childhood education, with particular emphasis on learning strategies, teacher support, and learning environments. The study employed a systematic literature review approach guided by PRISMA 2020 principles. Eleven peer-reviewed articles published between 2016 and 2026 were selected from Scopus, Web of Science, ERIC, ScienceDirect, Google Scholar, SINTA, and GARUDA and analyzed using thematic narrative synthesis. The results revealed three dominant dimensions. Teacher competence and professional support appeared in 9 of 11 studies (81.8%), inclusive learning-environment factors in 8 studies (72.7%), and adaptive instructional strategies in 6 studies (54.5%). Empirically, embedded instruction demonstrated a strong overall effect on learning outcomes (Tau-U = 0.80), while peer-mediated intervention, scaffolding, individualized instruction, professional development, and environmental adaptation were associated with improved participation, communication, engagement, and social interaction. Conversely, limited teacher knowledge, inadequate training, insufficient resources, and poorly adapted environments remained major barriers. The review concludes that meaningful inclusive early childhood education is achieved through the integration of adaptive pedagogy, professionally supported teachers, and accessible physical, social, and emotional environments.

KEYWORDS: Inclusive Education; Children With Special Needs; Early Childhood Education; Teacher Support; Learning Environment.

INTRODUCTION

Inclusive education has become a central principle in contemporary educational discourse because it affirms the right of every child, including children with special educational needs (SEN), to participate meaningfully in high-quality learning within mainstream educational settings. In early childhood education (ECE), inclusion has particular significance because early learning experiences influence subsequent cognitive, linguistic, socio-emotional, and adaptive development. Inclusion, however, should not be understood merely as the physical placement of children with disabilities in regular classrooms. Meaningful inclusion requires equitable opportunities for participation, interaction, learning, belonging, and developmental progress. Recent evidence indicates that children with disabilities may still demonstrate lower levels of participation, involvement, and peer engagement than typically developing children even when they are

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enrolled in inclusive early childhood settings (Dott & Licandro, 2025). Thus, access to mainstream classrooms does not automatically guarantee authentic educational inclusion.

One of the major challenges lies in teachers' capacity to translate the philosophy of inclusion into developmentally appropriate practices. Research consistently indicates that early childhood teachers generally express positive attitudes toward including children with SEN, yet many remain uncertain about their professional competence, particularly when teaching children with severe disabilities, autism, communication difficulties, or challenging behaviors (Yu & Park, 2020; Yu & Cho, 2022). Similar patterns have been identified in Indonesia. Arini and Kurniawati (2020) emphasize the importance of teachers' attitudes in determining the quality of educational experiences offered to young children with autism, while Rahardjo (2022) reports continuing limitations in teachers' knowledge and understanding of support for children with special needs. More recent evidence similarly indicates that insufficient professional preparation, limited training, and inadequate resources continue to constrain the implementation of inclusive ECE (Faizin et al., 2025).

Current scholarship has progressively shifted from debating whether children with SEN should be educated inclusively toward identifying the conditions under which inclusion becomes educationally meaningful. Contemporary inclusive pedagogy emphasizes differentiated instruction, curriculum adaptation, scaffolding, embedded instruction, play-based learning, peer-mediated approaches, Universal Design for Learning (UDL), assistive technology, and collaborative support. Embedded instruction, for example, has demonstrated substantial effects on the learning outcomes of young children with disabilities because learning targets can be incorporated into naturally occurring classroom routines and activities (Snyder et al., 2023). Likewise, peer-based intervention can enhance social engagement and provide children with SEN with structured opportunities to develop play and interaction skills alongside peers.

UDL has emerged as another important framework because it promotes multiple means of engagement, representation, and expression rather than requiring all children to learn through identical activities. Evidence from inclusive preschool classrooms shows that multisensory materials, flexible learning activities, differentiated levels of complexity, and meaningful problem-solving opportunities can increase children's engagement and learning when implemented collaboratively by general and special educators (Jhuo & Chu, 2026). Tiǵere et al. (2025) similarly position UDL as a promising framework for designing inclusive preschool education for autistic children. Recent studies also highlight play as a critical context for inclusion, particularly when teachers individualize play activities, facilitate peer support, and provide appropriate adult guidance.

Teacher competence remains equally central. Systematic evidence demonstrates that professional development can strengthen teachers' knowledge, attitudes, confidence, and instructional skills for inclusive education (Tristani & Bassett-Gunter, 2020). Petersson Bloom (2021) further showed that structured professional development can strengthen preschool professionals' awareness of inclusive practices for autistic children. A recent systematic review identifies differentiation and curriculum adaptation, collaboration, disability-related knowledge, inclusive values, educational technology, reflective practice, and psychological readiness as core competencies required of inclusive early childhood educators (Suprihatiningrum et al., 2025). In Indonesia, teacher training, mentoring, contextual learning, and professional collaboration have likewise been identified as mechanisms for strengthening inclusive PAUD practices (Purnamasari et al., 2024; Faizin et al., 2025).

Beyond instructional techniques, contemporary research increasingly conceptualizes inclusion as an ecological phenomenon. Supportive teacher–child relationships contribute to children's security, engagement, and participation (Sanches-Ferreira et al., 2022), whereas collaboration among teachers, specialists, and families creates continuity between educational and developmental support systems. Home–preschool collaboration is particularly important because the educational needs of children with SEN cannot be addressed exclusively inside the classroom. Effective collaboration with parents can improve understanding of children's characteristics, learning priorities, and appropriate interventions, although differences in expectations, professional knowledge, and resources may complicate this partnership (Sari, 2020). Physical and sensory characteristics of learning environments are also receiving increasing attention; Aminpour et al. (2026), for example, demonstrate the importance of aligning inclusive pedagogy with spatial design in neurodiversity-friendly preschool environments.

Despite these advances, the literature remains fragmented. Many studies investigate teacher attitudes, competencies, pedagogical interventions, family collaboration, peer interaction, or environmental accessibility

independently rather than examining their interrelationships as components of one inclusive educational ecosystem. Furthermore, teacher acceptance of inclusion does not necessarily correspond to instructional readiness (Yu & Cho, 2022), and physical inclusion does not necessarily produce equivalent social participation (Dott & Licandro, 2025). Children with autism and other developmental disabilities may remain less socially engaged with peers despite attending inclusive classrooms (Drye et al., 2024). Studies from developing and resource-constrained contexts also identify shortages of specialist support, teacher preparation, and materials as persistent obstacles (Kim et al., 2026).

A further gap concerns the limited integration of evidence from international research with the realities of Indonesian early childhood education. Indonesian reviews have identified challenges concerning teacher competence, policy implementation, access, and resources (Nadifa et al., 2024; Faizin et al., 2025), but a synthesis simultaneously examining learning strategies, teacher support, and learning environments remains particularly valuable. This integration is important because inclusive education is increasingly understood not as a single instructional method but as the interaction between pedagogical adaptation, professional capacity, relationships, resources, classroom organization, and institutional culture.

Accordingly, this literature review aims to critically synthesize recent empirical and conceptual evidence concerning inclusive education for children with special needs in early childhood education, with particular emphasis on (1) inclusive learning strategies, (2) teacher competence and support systems, and (3) physical, social, and pedagogical learning environments. The novelty of this review lies in integrating these three dimensions into a unified analytical framework rather than discussing them as isolated determinants. It also bridges international evidence with findings from the Indonesian ECE context and interprets inclusion beyond access by emphasizing participation, engagement, belonging, and developmental responsiveness.

Overall, the literature demonstrates that successful inclusive early childhood education depends on more than placing children with SEN in mainstream classrooms. Its quality emerges from the interaction of responsive pedagogy, professionally supported teachers, meaningful peer and family relationships, and accessible learning environments. Consequently, synthesizing these interconnected dimensions is essential for identifying evidence-based practices, persistent barriers, and strategic directions capable of transforming inclusive ECE from a policy commitment into meaningful participation and learning for every child.

METHOD

This study employed a systematic literature review approach to synthesize empirical and conceptual evidence concerning inclusive education for children with special needs in early childhood education, with particular attention to instructional strategies, teacher support, and learning environments. A literature review was selected because it enables researchers to identify patterns, consolidate fragmented findings, evaluate developments in a field, and generate conceptual interpretations from existing research (Snyder, 2019). To enhance methodological transparency and reproducibility, the review process was informed by systematic review procedures proposed by Xiao and Watson (2019) and the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA 2020) framework developed by Page et al. (2021). PRISMA emphasizes transparent reporting of identification, screening, eligibility assessment, and final study inclusion.

The literature search focused on peer-reviewed studies published within the last ten years. Electronic searches were conducted through major scholarly databases and indexing services, including Scopus, Web of Science, ERIC, ScienceDirect, Google Scholar, and Indonesian scholarly databases such as SINTA and GARUDA. Database diversification was intended to incorporate both international and Indonesian perspectives on inclusive early childhood education. Systematic searching across multiple information sources is recommended to minimize retrieval bias and improve the comprehensiveness of evidence synthesis (Aromataris & Munn, 2020; Page et al., 2021). Search terms were developed using combinations of Boolean operators, including “inclusive early childhood education,” “children with special educational needs,” “children with disabilities,” “inclusive teaching strategies,” “teacher support,” “teacher competence,” “learning environment,” “inclusive preschool,” and “early childhood special education.”

Studies were considered eligible when they: (1) were published in peer-reviewed journals between 2016 and 2026; (2) addressed children with disabilities or special educational needs in preschool, kindergarten, or other early childhood settings; (3) investigated at least one of the three major review dimensions—learning

strategies, teacher support, or learning environments; (4) presented empirical findings or substantial conceptual analyses; and (5) were available in English or Indonesian. Studies focusing exclusively on primary, secondary, or higher education, non-peer-reviewed publications, conference abstracts without complete data, duplicate records, and articles with insufficient methodological information were excluded. Establishing explicit eligibility criteria before synthesis improves consistency and limits subjective study selection (Xiao & Watson, 2019; Snyder, 2019).

Following identification and screening, 11 articles met all eligibility criteria and constituted the final objects of analysis. Each article was reviewed using a structured extraction matrix containing authorship, publication year, country, research design, participant characteristics, disability or special-needs category, instructional strategy, form of teacher support, learning-environment characteristics, and major findings. Methodological quality was considered in relation to clarity of research objectives, appropriateness of design, participant description, data collection procedures, analytical rigor, and consistency between evidence and conclusions, consistent with principles of critical appraisal in evidence synthesis (Aromataris & Munn, 2020).

The extracted evidence was subsequently analyzed through thematic narrative synthesis. Findings were compared, coded, and clustered into three predetermined analytical domains: (1) inclusive learning strategies, (2) teacher competence and support, and (3) physical, social, and pedagogical learning environments. Within these domains, recurring patterns, differences, implementation barriers, enabling factors, and reported educational outcomes were identified. Narrative synthesis was considered appropriate because the selected studies differed in research design, participant characteristics, interventions, and outcome measures, making statistical meta-analysis inappropriate. Contemporary reviews of inclusive education similarly demonstrate the value of synthesizing differentiated instruction, scaffolding, collaborative support, professional capacity, and environmental factors as interconnected components of effective inclusive practice (Tristani & Bassett-Gunter, 2020; Petersson Bloom, 2021; Bakhytzhamal et al., 2026). The final synthesis therefore emphasized not only individual findings but also the relationships among pedagogy, teacher support, and environmental conditions in constructing meaningful and sustainable inclusive early childhood education.

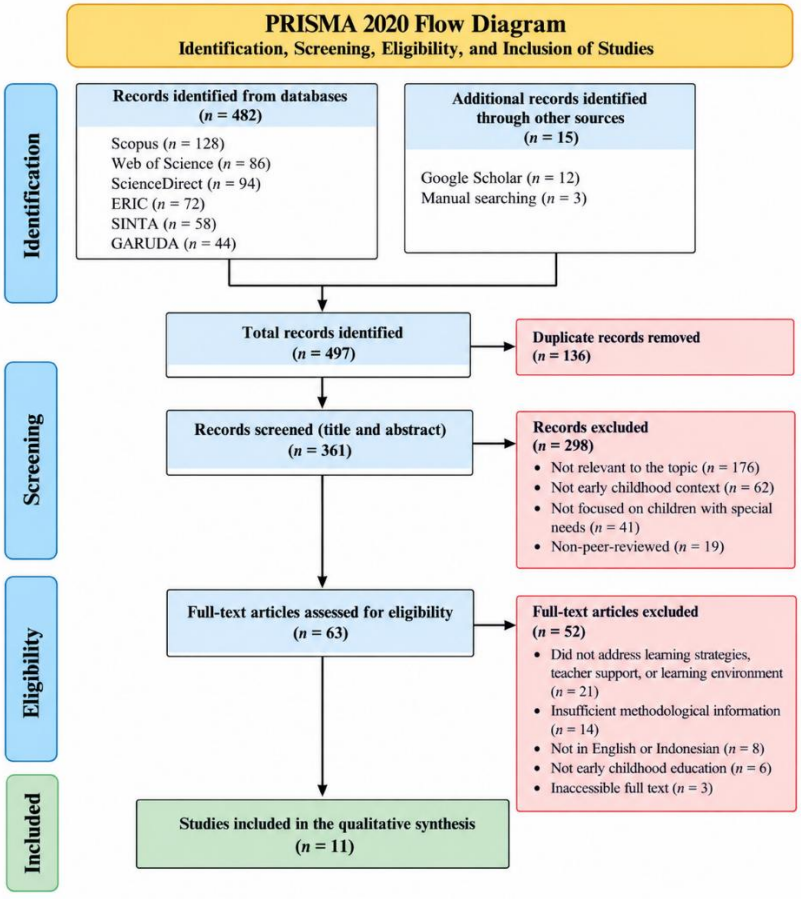


Figure 1. Prisma 2020 Flow Diagram of study selection

RESEARCH RESULTS AND DISCUSSION

Research Results

The systematic synthesis of the 11 selected articles revealed that inclusive education for children with special needs in early childhood settings is shaped by the dynamic interaction of three major dimensions: inclusive learning strategies, teacher competence and support, and inclusive learning environments. Although the methodological characteristics of the studies varied from empirical qualitative and quantitative investigations to systematic reviews and meta-analyses the findings demonstrated a relatively consistent pattern. Effective inclusion did not depend on a single instructional technique but rather on the integration of individualized pedagogy, professionally prepared teachers, responsive social relationships, and accessible physical and organizational environments.

Characteristics of the Reviewed Studies

The 11 articles included in the final synthesis were published between 2019 and 2025 and represented international as well as Indonesian contexts. The studies employed diverse methodological approaches, including systematic reviews, meta-analysis, qualitative case studies, questionnaire-based investigations, mixed methods, and scoping reviews. This methodological diversity allowed the present review to capture both measurable intervention outcomes and contextual factors associated with inclusive early childhood education.

Table 1. Characteristics and Major Findings of the 11 Reviewed Studies

Authors/Year	Context/Design	Main Focus	Principal Findings
Gunning et al. (2019)	Systematic review; 31 studies	Peer-mediated interventions for preschool children with autism	Peer-mediated approaches generally supported social interaction, communication, play, and engagement of preschool children with autism in inclusive environments.
Petersson Bloom (2021)	Mixed-method professional-development intervention	Preschool professionals' understanding of autism	Professional development increased autism awareness and contributed to changes in professional practice, particularly environmental adaptation and prevention of challenging situations.
Yu and Cho (2022)	Literature review; 16 studies	Preservice ECE teachers' attitudes and preparedness for inclusion	Preservice teachers generally demonstrated favorable attitudes toward inclusion but reported uncertainty regarding their competence to educate children with severe disabilities or challenging behavior.
Sanches-Ferreira et al. (2022)	Survey; 89 Portuguese preschool teachers	Teacher-child interaction strategies	Teachers rated inclusive interaction strategies as highly desirable, but consistently rated their feasibility lower. Lack of knowledge was a major explanation for the implementation gap.
Xu et al. (2022)	Instrument-development/validation study across multiple regions of China	Participation of children with special needs	Participation was multidimensional and involved learning participation, daily-life participation, teacher support, and parental attitudes; the developed instrument achieved strong reliability.
Snyder et al. (2023)	Systematic review and meta-analysis; 10 single-case studies, 21 participants	Embedded instruction	Embedded instruction produced a mean treatment effect of Tau-U = 0.80, indicating a strong effect on learning outcomes of young children with disabilities.
Tamblyn et al. (2023)	Systematic scoping review; 20 studies	Physical and sensory ECEC environments	Environmental quality, classroom conditions, outdoor environments, materials, sensory conditions, and classroom organization were associated with children's social-emotional outcomes.
Jusni et al. (2023)	Qualitative study, Yogyakarta; ECE manager and teachers (N = 5)	Inclusive ECE practices in Indonesia	Distributed leadership, diversity-supportive organizational culture, professional learning, collaboration, and inclusive pedagogy emerged as interconnected elements of successful inclusion.

Nadifa et al. (2024)	Systematic literature review; 24 studies	Inclusive preschool education in Indonesia	Major challenges included access, quality variation, policy support, infrastructure, and teacher competence; teacher training, individualized curricula, collaboration, and infrastructure adaptation were identified as priorities.
Maulidah and Mufalakhah (2024)	Qualitative case study, Yogyakarta	Instructional modification for a child with autism	Flexible and individualized modification of learning activities combined with intensive assistance increased engagement and supported academic and social development.
Faizin et al. (2025)	Systematic review; 16 articles	ECE teacher competence for inclusive education	Positive teacher attitudes were not always accompanied by adequate professional readiness. Continuous training, mentoring, parent collaboration, and specialist support strengthened inclusive practices.

The studies represented multiple dimensions of inclusive education rather than mutually exclusive themes. Based on thematic coding, teacher competence and support appeared in 9 of the 11 studies (81.8%), learning-environment factors in 8 studies (72.7%), and explicit adaptive or inclusive instructional strategies in 6 studies (54.5%). These percentages therefore indicate thematic prominence rather than independent categories.

Inclusive Learning Strategies

The first major finding concerned the importance of adapting instruction to individual children's developmental profiles rather than expecting children with special needs to conform to a uniform classroom curriculum. Across the reviewed studies, effective instructional practices included embedded instruction, individualized modification, peer-mediated learning, scaffolding, structured play, differentiated activities, and responsive teacher assistance. Among the strongest quantitative findings was the systematic review and meta-analysis of embedded instruction by Snyder et al. (2023). Ten single-case experimental studies involving 21 participants met the required methodological standards. Across these studies, embedded instruction generated an overall mean treatment effect of 0.80 (Tau-U) on children's learning outcomes. The findings also indicated evidence of skill maintenance and preliminary evidence of generalization across individuals, settings, or materials. Importantly, embedded instruction could be delivered by naturally occurring intervention agents, including classroom teachers and assistant teachers, within ordinary preschool routines. This suggests that effective special-needs intervention does not always require separating children from their peers or interrupting natural classroom activities. Peer-mediated approaches constituted a second important strategy. Gunning et al. (2019), through a systematic review of 31 articles focusing on preschool children with autism, demonstrated that peers can function as meaningful intervention partners in inclusive learning environments. Peer-mediated intervention provides opportunities for children with autism to practice communication, reciprocal interaction, play, and other social skills in naturally occurring contexts rather than relying exclusively on adult-directed interventions. At the Indonesian level, Maulidah and Mufalakhah (2024) found that flexible instructional modification for a child with autism including adapting classroom activities and providing intensive assistance supported engagement and developmental participation. Their qualitative case study reinforces the idea that curriculum adaptation should not reduce expectations for children with special needs; rather, it should modify the route through which children access meaningful learning experiences. Taken together, these findings demonstrate that instructional flexibility is a central characteristic of inclusive pedagogy. The evidence supports moving away from standardized, one-size-fits-all instruction toward teaching that recognizes individual differences in communication, attention, sensory processing, learning speed, behavioral regulation, and social participation.

Teacher Competence and Professional Support

Teacher competence emerged as the most frequently represented theme in the synthesis. Nine of the 11 reviewed studies directly or indirectly indicated that successful inclusion depends strongly on teachers' knowledge, attitudes, confidence, professional preparation, and access to collaborative support. Yu and Cho (2022), reviewing 16 studies on early childhood preservice teachers, found consistently positive attitudes

toward inclusion. However, favorable attitudes did not automatically correspond with perceived readiness. Teachers frequently reported uncertainty about educating children with severe disabilities and managing challenging behavior. This distinction between acceptance of inclusion and capacity to implement inclusion is particularly important because inclusive policy can be formally supported by teachers while classroom practices remain inadequately differentiated. Empirical evidence from Sanches-Ferreira et al. (2022) strengthens this interpretation. Among 89 Portuguese preschool teachers, strategies related to emotionally responsive interaction, classroom management, responsiveness to children's perspectives, and scaffolding were rated more highly for desirability than feasibility. This discrepancy occurred both at the whole-group and individual-child levels, with lack of knowledge reported as an important reason why theoretically desirable strategies were difficult to implement. Professional development appears capable of reducing this implementation gap. Petersson Bloom (2021) reported that a professional-development program based on a Lesson Study model increased preschool professionals' awareness of autism and was associated with changes in practice. Changes were especially evident in modifications to the learning environment and strategies designed to prevent difficult situations. Evidence from Indonesia follows a similar pattern. Faizin et al. (2025), synthesizing 16 articles, found that although many PAUD teachers displayed positive attitudes toward inclusive education, professional preparedness remained insufficient. Limited relevant training and resources constituted major barriers. Community-based professional training, workshops, mentoring, and collaboration with parents, psychologists, and therapists were identified as mechanisms for strengthening inclusive teaching capacity. The evidence therefore indicates that professional competence should not be conceptualized solely as individual teacher knowledge. Inclusive competence is better understood as a support system involving continuing professional development, mentoring, specialist consultation, collaboration among educators, parent partnerships, and institutional leadership.

Inclusive Learning Environment

The third major theme concerned the physical, sensory, social, emotional, and organizational characteristics of the learning environment. Across the reviewed literature, learning environments influenced whether children could participate actively, communicate with peers, regulate their behavior, feel secure, and access classroom activities. Tamblyn et al. (2023) screened 8,378 records, assessed 589 full-text studies, and included 20 studies in their systematic scoping review of physical and sensory ECEC environments. The synthesis showed that environmental quality, classroom characteristics, outdoor environments, and related contextual factors were associated with children's social-emotional competence. Conversely, inappropriate classroom materials, environmental conditions, classroom chaos, and certain sensory characteristics were associated with less favorable social-emotional outcomes. However, the inclusive environment extends beyond physical accessibility. Sanches-Ferreira et al. (2022) demonstrated that emotionally responsive interactions, classroom management, sensitivity to children's perspectives, and instructional scaffolding are core characteristics of high-quality inclusive classrooms. Positive teacher-child relationships provide children with psychological security and facilitate engagement in classroom activities. For children with disabilities, these supportive interactions may be particularly important because additional assistance can be necessary for maintaining active participation. Xu et al. (2022) similarly conceptualized inclusion in terms of participation rather than placement alone. Their instrument for examining the participation of children with special needs incorporated four interconnected dimensions: learning participation, life participation, teacher support, and parental attitudes. The total instrument obtained a Cronbach's alpha coefficient of 0.950, while coefficients for individual dimensions ranged from 0.916 to 0.981, indicating strong internal consistency. This empirical structure reinforces the proposition that meaningful inclusion requires engagement across educational and social domains.

Evidence from the Indonesian Context

The Indonesian studies showed substantial consistency with international findings but also revealed important contextual challenges. Jusni et al. (2023), examining an inclusive early childhood setting in Yogyakarta, identified three interconnected elements: leadership, organizational culture, and inclusive pedagogy. The study involved one ECE manager and four teachers and found that distributed leadership, positive attitudes toward diversity, continuous professional learning, reflective practice, collaboration, and adaptive play-and-learning activities contributed to an inclusive institutional culture. Nadifa et al. (2024), through a systematic review of 24 studies published between 2020 and 2024, nevertheless demonstrated that implementation gaps remain across

Indonesian inclusive preschool education. Limited access, variation in educational quality, inadequate policy support, infrastructure limitations, and uneven teacher capacity were recurrent barriers. Their synthesis emphasized teacher training, curriculum development according to children's individual needs, infrastructure adaptation, cross-sector collaboration, parental involvement, and stronger institutional support. Thus, the Indonesian evidence suggests that inclusion cannot be achieved solely through classroom-level teacher commitment. It requires simultaneous improvements in professional capacity, institutional leadership, infrastructure, collaboration, policy implementation, and organizational culture.

Thematic Synthesis

Table 2. Cross-Study Synthesis of the Major Dimensions of Inclusive ECE

Dimension	Studies Coded*	Main Practices/Factors	Empirical/Conceptual Outcomes
Inclusive learning strategies	6/11 (54.5%)	Embedded instruction, peer-mediated intervention, individualized activities, scaffolding, instructional modification, play-based/adaptive learning	Improved learning acquisition, engagement, social communication, interaction, participation, and skill maintenance
Teacher competence and support	9/11 (81.8%)	Professional development, mentoring, autism/SEN knowledge, collaboration, reflective practice, specialist and parent support	Improved teacher awareness, confidence, environmental adaptation, classroom responsiveness, and implementation capacity
Inclusive learning environment	8/11 (72.7%)	Accessible physical setting, appropriate sensory conditions, positive classroom climate, teacher-child relationships, peer interaction, organizational culture	Greater engagement, emotional security, participation, social-emotional competence, and sense of belonging
Cross-dimensional integration	Recurrent across the synthesis	Combination of adaptive pedagogy + competent teachers + supportive environment	More meaningful inclusion than physical placement alone

**The categories overlap because an individual study could contribute evidence to more than one analytical dimension.*

Integrated Conceptual-Empirical Findings

The synthesis led to an integrative finding: meaningful inclusive ECE is produced by the interaction between pedagogy, human support, and environmental accessibility rather than by any single component independently. The three dimensions identified in this review can therefore be represented conceptually as:

Inclusive Learning Strategies → Active Learning and Skill Development
Teacher Competence and Support → Responsive and Sustainable Implementation
Inclusive Learning Environment → Participation, Interaction, Security, and Belonging
Integration of the Three Dimensions → Meaningful Inclusive Early Childhood Education

The empirical evidence further suggests a progression from access to participation, and from participation to developmental outcomes. Merely admitting children with special needs to mainstream preschool settings constitutes only the initial condition of inclusion. Children must also be provided with instructional access through differentiated strategies, social access through peer and teacher interaction, emotional access through safe and responsive relationships, and environmental access through appropriate physical and sensory conditions.

This distinction is critical because the reviewed literature repeatedly demonstrates a gap between inclusive ideals and implementation capacity. Teachers may value inclusive education while lacking the knowledge and resources needed to implement it effectively (Yu & Cho, 2022; Sanches-Ferreira et al., 2022). Similarly, an inclusive classroom may provide physical access without guaranteeing meaningful participation. Professional development and systematic support therefore operate as mediating mechanisms that transform inclusive policy into instructional practice.

Summary of the Results

Overall, the analysis of the 11 studies confirms that effective inclusive early childhood education is multidimensional. First, adaptive learning strategies such as embedded instruction, peer-mediated intervention, individualized modification, scaffolding, and flexible play-based learning enable children with

special needs to access learning according to their developmental characteristics. The particularly strong effect reported for embedded instruction (Tau-U = 0.80) provides empirical support for integrating individualized learning objectives into naturally occurring preschool activities. Second, teacher competence represents a central enabling condition. Positive attitudes toward inclusion are important but insufficient unless accompanied by specific knowledge, instructional skill, confidence, professional development, mentoring, and collaboration. Third, the learning environment operates simultaneously at physical, sensory, social, emotional, and organizational levels. Effective inclusion requires classrooms that are accessible and predictable while also providing supportive teacher-child relationships, peer interaction, psychological security, and an institutional culture that respects diversity. The central result of this review is therefore that the quality of inclusive PAUD/ECE can be understood through an integrated framework consisting of adaptive pedagogy, empowered teachers, and supportive learning environments. These components are mutually reinforcing: adaptive strategies become more effective when teachers possess adequate competencies; teacher competence becomes actionable when schools provide professional and organizational support; and accessible environments become educationally meaningful when children are actively engaged in appropriately differentiated learning and social interaction.

Discussion

The findings of this review indicate that effective inclusive education for children with special needs in early childhood settings is not determined by school placement alone, but by the quality of interaction among adaptive learning strategies, teacher competence and professional support, and inclusive learning environments. This multidimensional pattern is consistent with contemporary perspectives on inclusion that shift attention from mere physical access toward participation, engagement, belonging, and meaningful developmental outcomes. Xu et al. (2022), for example, conceptualized participation in preschool inclusion through four interconnected dimensions learning participation, life participation, teacher support, and parental attitudes suggesting that inclusion must be evaluated through children's actual involvement in educational and social activities rather than enrollment status alone.

The first major finding concerns the role of adaptive and individualized learning strategies. The reviewed studies demonstrate that children with special needs benefit when learning objectives are embedded into naturally occurring classroom activities, adjusted according to individual developmental profiles, and supported through peer interaction and scaffolding. This interpretation is strongly supported by Snyder et al. (2023), whose systematic review and meta-analysis reported a mean treatment effect of Tau-U = 0.80 for embedded instruction among young children with disabilities. Their findings further indicated that skills acquired through embedded instruction could be maintained over time and, in some cases, generalized to new settings, people, or materials. Such evidence supports a pedagogical shift from segregated remedial instruction toward flexible learning opportunities embedded within ordinary preschool routines.

This pattern is also consistent with broader intervention evidence. Fang et al. (2023) found that early childhood interventions conducted in educational settings produced promising effects on social-communication skills (d = 1.22) and language development (d = 0.55) among children with autism and other developmental disabilities, although substantial heterogeneity was noted across studies. These findings suggest that inclusive instructional strategies can produce meaningful developmental outcomes, but their effectiveness depends on diagnosis, context, intervention design, and implementation quality. Similarly, the broader autism intervention literature emphasizes that intervention effects vary considerably according to outcome domain and study quality, reinforcing the importance of selecting developmentally appropriate and evidence-informed practices rather than assuming that one approach will benefit all children equally.

The second major finding is that teacher competence acts as a critical mechanism connecting inclusive policy with classroom practice. The reviewed literature consistently shows that teachers may hold positive attitudes toward inclusion while simultaneously feeling insufficiently prepared to teach children with complex disabilities. Yu and Cho (2022), based on 16 studies, found that preservice early childhood teachers generally supported inclusion but expressed uncertainty when working with severe disabilities and challenging behavior. This gap between ideological acceptance and practical readiness is especially important in early childhood settings, where teachers must respond simultaneously to communication, behavioral, sensory, emotional, and developmental diversity.

The results reported by Sanches-Ferreira et al. (2022) further demonstrate this problem. Among 89 preschool teachers, strategies related to emotionally supportive interactions, classroom management, responsiveness to children's perspectives, and scaffolding were viewed as highly desirable, yet their perceived feasibility was lower. Limited professional knowledge was identified as an important explanation for this discrepancy. Thus, strengthening inclusion requires more than encouraging positive attitudes; it requires sustained professional learning that develops actionable pedagogical competence.

Evidence from professional development studies confirms this interpretation. Petersson Bloom (2021) found that collaborative professional development using a Lesson Study model significantly increased preschool professionals' competence regarding autism, learning-environment adjustments, and prevention of challenging situations. In the Indonesian context, Faizin et al. (2025), based on a systematic synthesis of 16 studies, similarly concluded that continuous training, mentoring, workshops, collaboration with parents, and support from psychologists and therapists can strengthen PAUD teachers' competence in inclusive classrooms. These findings indicate that teacher competence should be understood as both an individual and organizational capacity.

The third major theme concerns the learning environment. The evidence demonstrates that inclusive environments involve physical, sensory, emotional, social, and organizational dimensions. Tamblyn et al. (2023), after screening 8,378 studies and including 20 studies in their scoping review, reported that classroom quality, physical conditions, outdoor environments, sensory features, and environmental organization were associated with preschool children's social-emotional outcomes. Conversely, classroom chaos and inappropriate environmental conditions were related to less favorable outcomes. Consequently, environmental accessibility should not be reduced to ramps, furniture, or spatial access; it also concerns predictability, sensory comfort, emotional security, communication opportunities, and the organization of peer interaction.

This broader conception is particularly relevant to Indonesia. Jusni et al. (2023) found that inclusive early childhood practice in Yogyakarta was supported by distributed leadership, organizational culture, professional learning, collaboration, and adaptive pedagogy. However, Nadifa et al. (2024), reviewing 24 Indonesian studies, identified persistent barriers involving limited access, uneven educational quality, inadequate infrastructure, policy support, and teacher competence. These contextual findings demonstrate that inclusive PAUD cannot be sustained solely through individual teacher effort; institutional commitment and systemic support are equally essential.

Overall, the present review supports an integrated interpretation in which adaptive pedagogy provides access to learning, competent and supported teachers translate inclusion into practice, and responsive environments enable participation and belonging. These dimensions are mutually reinforcing. Inclusive education is therefore most effective when it moves beyond physical placement toward an ecological model that aligns pedagogy, professional capacity, family collaboration, peer relationships, institutional culture, and environmental accessibility. This integrated perspective constitutes an important implication for Indonesian PAUD, where future policy and practice should prioritize not merely increasing the number of inclusive institutions, but improving the quality of children's actual participation and developmental experiences.

CONCLUSION

This literature review concludes that effective inclusive education for children with special needs in early childhood settings depends on the integration of adaptive learning strategies, competent and well-supported teachers, and inclusive learning environments. The synthesis of 11 selected studies showed that teacher competence and professional support constituted the most frequently identified dimension, appearing in 9 studies (81.8%), followed by learning-environment factors in 8 studies (72.7%) and adaptive instructional strategies in 6 studies (54.5%). These findings confirm that inclusion cannot be reduced to the physical placement of children with special needs in mainstream classrooms.

Empirically, embedded instruction demonstrated a strong overall treatment effect (Tau-U = 0.80), indicating that individualized learning objectives integrated into natural classroom routines can substantially improve developmental and learning outcomes. Evidence also showed that peer-mediated intervention, instructional modification, scaffolding, teacher professional development, and collaborative support improve

children's participation, communication, engagement, and social interaction. In contrast, limited teacher knowledge, inadequate professional preparation, insufficient infrastructure, and poorly organized physical or sensory environments remain important barriers.

Conceptually, this review supports an integrated framework in which adaptive pedagogy facilitates access to learning, teacher competence enables effective implementation, and supportive environments promote participation, security, and belonging. Therefore, meaningful inclusion in early childhood education should be evaluated through children's actual engagement and developmental participation rather than enrollment alone.

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