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Child Development-Based Instructional Planning in Early Childhood Education: A Literature Review on Principles, Strategies, and Implementation

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ABSTRACT

Developmentally based learning planning is a fundamental component of high-quality early childhood education because young children differ in developmental readiness, interests, abilities, learning experiences, and sociocultural backgrounds. This study aimed to synthesize conceptual and empirical evidence regarding the principles, strategies, and implementation of developmentally based learning planning in early childhood education. A systematic literature review was conducted using the PRISMA 2020 framework. Relevant studies published between 2016 and 2026 were identified through Scopus, Web of Science, ERIC, ScienceDirect, Google Scholar, and SINTA/GARUDA-indexed sources. Following identification, screening, eligibility assessment, and full-text evaluation, 17 articles were included in the final thematic synthesis. The results identified six major principles: developmental appropriateness, holistic development, play-based learning, responsive teacher child interaction, inclusion and diversity, and contextual flexibility. Empirical evidence showed that guided play positively influenced early mathematics ($g = 0.24$), shape knowledge ($g = 0.63$), task switching ($g = 0.40$), and spatial vocabulary ($g = 0.93$). Executive-function interventions improved working memory ($d = 0.46$), inhibitory control ($d = 0.30$), and cognitive flexibility ($d = 0.47$), while teacher professional development improved interaction quality ($g = 0.39$). The review concludes that effective planning should integrate developmental observation, intentional play, responsive interaction, authentic assessment, reflection, and continuous replanning within inclusive and context-sensitive learning environments.

KEYWORDS: Child Development; Early Childhood Education; Learning Planning; Play-Based Learning; Developmentally Appropriate Practice

INTRODUCTION

Early childhood education constitutes a critical developmental context in which educational experiences influence children's cognitive, linguistic, physical, social, emotional, and self-regulatory development. Consequently, learning planning in early childhood education cannot simply replicate subject-oriented or teacher-centered models commonly used at higher levels of education. The National Association for the Education of Young Children (NAEYC, 2020) conceptualizes developmentally appropriate practice as an approach in which educational decisions are informed by three interconnected considerations: knowledge of general patterns of child development, recognition of individual characteristics and differences, and understanding of children's social and cultural contexts. Thus, developmentally based learning planning requires teachers to translate knowledge of child development into objectives, learning experiences, environmental arrangements, interactions, and assessment practices that respond to children's actual developmental needs.

However, evidence indicates that translating developmental principles into classroom planning remains challenging. Pyle and Danniels (2017) found that teachers differ considerably in understanding the relationship

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between play and academic learning, resulting in practices ranging from almost entirely child-directed free play to strongly teacher-directed instruction. Similarly, Mengstie (2023) identified discrepancies between preschool teachers' stated beliefs regarding developmentally appropriate practice and their actual classroom practices, while Taye et al. (2025) showed that teachers' interpretations of developmentally appropriate practice are influenced by professional knowledge, beliefs, institutional expectations, and contextual constraints. These findings suggest that possessing curriculum documents does not automatically ensure that teachers design learning experiences consistent with children's developmental characteristics.

The problem is particularly important because early learning outcomes depend substantially on the quality of everyday pedagogical processes. A meta-analysis by von Suchodoletz et al. (2023), synthesizing 1,044 effect sizes from 185 studies, demonstrated that process-quality indicators were significantly associated with children's academic achievement, behavioral skills, social competence, and reduced social-emotional problems. Earlier evidence from Perlman et al. (2016) likewise indicated that teacher–child interaction quality is positively associated with developmental outcomes, although effect sizes vary across domains. Therefore, effective planning should not merely identify "what activities will be taught" but should anticipate how teachers interact, scaffold, observe, adapt, and respond to children during those activities.

Contemporary scholarship increasingly positions play, guided interaction, developmental assessment, self-regulation, and social-emotional learning as interconnected components of high-quality early childhood pedagogy. Pyle, DeLuca, and Danniels (2017), based on a review of 168 studies, proposed that play-based pedagogy should not be reduced to a binary opposition between free play and formal instruction. Instead, different forms of play may support different developmental and academic purposes. This argument is reinforced by Zosh et al. (2018), who conceptualized play as a spectrum characterized by meaningful, joyful, actively engaging, iterative, and socially interactive experiences. Yogman et al. (2018) similarly emphasized that developmentally appropriate play facilitates language, executive functioning, problem solving, social competence, emotional regulation, and cognitive development.

The concept of guided play has further strengthened the theoretical bridge between child agency and intentional instructional planning. Weisberg et al. (2016) argued that guided play maintains children's autonomy while educators intentionally structure environments and provide scaffolding toward learning goals. Empirically, Skene et al. (2022), reviewing 39 studies and conducting meta-analysis on 17 studies involving 3,893 children, found that guided play produced stronger outcomes than direct instruction in early mathematics, shape knowledge, and task switching, and outperformed free play in spatial vocabulary. Thus, developmentally appropriate planning requires neither unstructured freedom nor rigid instruction, but a carefully designed balance between child initiative and purposeful teacher guidance.

Current research also demonstrates that developmental planning must address self-regulation and social-emotional competence rather than focusing narrowly on academic readiness. Murano et al. (2020) reported small-to-moderate positive effects of preschool social-emotional learning interventions, while Blewitt et al. (2018) found significant improvements in social competence, emotional competence, behavioral self-regulation, and early learning outcomes across curriculum-based SEL interventions. Blewitt et al. (2020) further demonstrated that such curricula can strengthen responsive teacher–child interactions and classroom management. Likewise, Scionti et al. (2020) reported a significant overall effect of cognitive training on preschool executive functions, whereas Pauli-Pott et al. (2020) found improvements in working memory, inhibitory control, and cognitive flexibility following targeted preschool interventions. Savina (2021) therefore argues that self-regulation should be intentionally supported through classroom environments, routines, interactions, and age-appropriate learning tasks.

Another important development concerns reflective planning based on observation and assessment. Developmentally appropriate curricula require educators to continuously observe children and use evidence of emerging interests, abilities, difficulties, and developmental progress to modify subsequent experiences. Wanoa and Johnston (2020) emphasize that formative assessment becomes meaningful when assessment information is explicitly connected to planning for children's further learning. At the teacher level, Egert et al. (2020) demonstrated through meta-analysis that professional development significantly improved teacher–child interactions, particularly when training included feedback, modeling, and self-reflection. Accordingly, planning should be understood as a cyclical process of observation–interpretation–planning–implementation–assessment–reflection, rather than as a static administrative document.

Evidence from Indonesia reflects similar concerns. Lestari et al. (2020) showed that learning planning remains administratively demanding for some early childhood educators, motivating the development of technology-supported planning systems. Kasmiati (2021) demonstrated that planning can integrate multicultural values when learning objectives, content, activities, and assessment are deliberately aligned, while Nadlifah et al. (2022) emphasized the importance of intentionally stimulating children's social-emotional development through contextually appropriate learning. More recent Indonesian reviews also indicate that structured play-based learning contributes to problem solving, logical thinking, and symbolic thinking (Nafisah et al., 2026), while Universal Design for Learning offers possibilities for responding systematically to diversity in early childhood classrooms (Haris et al., 2025).

Despite these advances, the literature remains fragmented. Existing studies frequently examine individual components such as play-based learning, guided play, executive function, social-emotional learning, assessment, teacher–child interaction, inclusive practices, or technological planning without synthesizing them into an integrated framework for developmentally based learning planning. Reviews by Pyle et al. (2017), Yee et al. (2022), and Skene et al. (2022) concentrate primarily on play pedagogy, whereas studies by Blewitt et al. (2018), Murano et al. (2020), and Scionti et al. (2020) focus on particular developmental outcomes. Similarly, Indonesian studies tend to investigate specific planning applications or particular developmental domains rather than systematically mapping the principles, strategies, and implementation mechanisms that connect developmental theory with everyday instructional planning.

A second gap concerns the persistent theory–practice divide. Although contemporary frameworks advocate child-centered, culturally responsive, inclusive, play-based, and assessment-informed learning, empirical evidence shows variation between teachers' beliefs and enacted practices. Furthermore, the dominance of evidence from Western ECEC systems limits direct generalization to culturally diverse settings such as Indonesia. Von Suchodoletz et al. (2023) explicitly noted that much of the international evidence on ECEC quality is concentrated in the United States and other established ECEC systems. Therefore, a synthesis capable of connecting international developmental principles with context-sensitive implementation is necessary.

Accordingly, this literature review aims to critically synthesize recent conceptual and empirical evidence concerning developmentally based learning planning in early childhood education, with particular attention to principles, pedagogical strategies, assessment-informed planning, and implementation practices. The review specifically examines how knowledge of developmental stages, individual differences, cultural contexts, play, teacher scaffolding, social-emotional development, self-regulation, inclusion, and authentic assessment can be translated into coherent learning plans.

The novelty of this review lies in its integrated analytical perspective. Rather than treating developmental appropriateness, play-based pedagogy, assessment, teacher interaction, and inclusion as separate topics, the study positions them as mutually dependent components of a single planning cycle. Developmentally based planning is therefore conceptualized as a dynamic, responsive, evidence-informed, play-oriented, inclusive, and context-sensitive pedagogical process in which learning objectives, experiences, environments, teacher roles, and assessment are continuously adjusted according to children's developmental trajectories.

In summary, contemporary evidence demonstrates that effective early childhood learning planning should move beyond administrative lesson preparation toward an adaptive pedagogical system grounded in knowledge of child development. Developmentally appropriate planning requires meaningful play, intentional scaffolding, responsive teacher–child interaction, opportunities for autonomy and self-regulation, inclusive learning environments, culturally relevant experiences, and continuous formative assessment. The remaining challenge is to integrate these principles into a coherent framework that educators can realistically implement. This literature review therefore provides a conceptual and empirical synthesis intended to clarify how developmentally based learning planning can bridge developmental theory, pedagogical strategy, and everyday practice in early childhood education.

METHOD

This study employed a systematic literature review approach to synthesize conceptual and empirical evidence concerning developmentally based learning planning in early childhood education, particularly its principles, instructional strategies, and implementation. A systematic approach was selected because it

enables researchers to identify, evaluate, organize, and synthesize fragmented evidence through transparent and reproducible procedures rather than relying on unsystematic narrative selection (Snyder, 2019; Xiao & Watson, 2019). The review process was structured according to the Preferred Reporting Items for Systematic Reviews and Meta-Analyses (PRISMA) 2020 framework proposed by Page et al. (2021), which emphasizes transparent reporting of study identification, screening, eligibility assessment, and final inclusion.

Literature searches covered publications from 2016 to 2026 to represent contemporary theoretical developments and empirical evidence within the previous ten years. Searches were conducted across Scopus, Web of Science, ERIC, ScienceDirect, Google Scholar, and Indonesian SINTA/GARUDA-indexed sources. Multiple databases were employed because search platforms differ in coverage, precision, retrieval capability, and reproducibility; consequently, reliance on a single search system may produce incomplete evidence identification (Gusenbauer & Haddaway, 2020). Google Scholar was used primarily as a supplementary source rather than the sole principal database. Search procedures were documented following the transparency principles emphasized by Rethlefsen et al. (2021) in PRISMA-S.

The search strategy combined Boolean operators and keywords such as “developmentally appropriate practice,” “child development,” “learning planning,” “lesson planning,” “early childhood education,” “preschool,” “play-based learning,” “guided play,” “developmental assessment,” “teacher-child interaction,” “instructional strategy,” and “early childhood curriculum.” Equivalent Indonesian terms, including perencanaan pembelajaran, perkembangan anak, pembelajaran berbasis bermain, and pendidikan anak usia dini, were also applied. The eligibility framework followed the principle that review questions, search terms, and inclusion criteria should be explicitly aligned to minimize arbitrary selection (Peters et al., 2020).

Articles were included when they: (1) were published between 2016 and 2026; (2) were peer-reviewed journal articles indexed in Scopus, Web of Science, SINTA, or comparable scholarly databases; (3) addressed early childhood education; (4) discussed developmental principles, learning planning, pedagogical strategies, play, assessment, teacher–child interaction, or implementation; (5) contained conceptual or empirical evidence; and (6) were available in English or Indonesian. Editorials, theses, conference abstracts, duplicated publications, non-scholarly sources, studies outside early childhood education, and papers without sufficient methodological information were excluded.

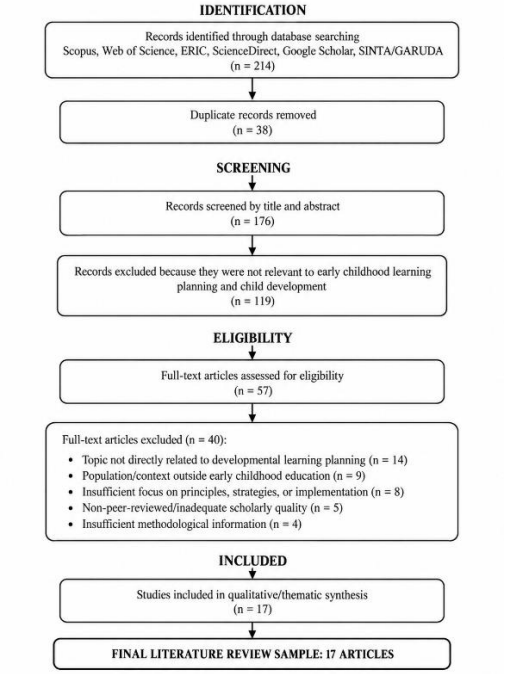

Figure 1. Prisma 2020 Flow Diagram of study selection

Study selection followed four PRISMA stages: identification, screening, eligibility, and inclusion. Titles and abstracts were screened first, followed by full-text examination against predetermined inclusion criteria. Methodological quality was considered using principles compatible with the Mixed Methods Appraisal Tool (MMAT), which permits appraisal across qualitative, quantitative, and mixed-method research designs (Hong et al., 2018).

Data from the 17 eligible articles were extracted into a synthesis matrix containing authors, year, country, study design, participants, developmental focus, planning principles, instructional strategies, implementation characteristics, and principal findings. The findings were subsequently analyzed through thematic synthesis, involving familiarization, coding, category development, theme construction, comparison, and interpretation. Consistent with Braun and Clarke (2021), themes were developed analytically rather than being treated merely as descriptive labels. Three overarching analytical dimensions guided the synthesis: (1) principles of developmentally based planning, (2) pedagogical and instructional strategies, and (3) implementation in early childhood educational settings. This procedure enabled conceptual theories and empirical findings to be integrated into a coherent explanatory framework.

RESEARCH RESULTS AND DISCUSSION

Research Results

The systematic review identified 17 eligible articles addressing developmentally based learning planning in early childhood education from conceptual, empirical, systematic-review, and meta-analytic perspectives. The selected literature covered developmentally appropriate practice (DAP), play-based and guided learning, teacher–child interaction, social-emotional learning, executive functions, inclusive education, professional development, and contextualized instructional planning. Collectively, the evidence indicates that developmentally appropriate learning planning is not limited to preparing lesson objectives and activities; rather, it is a multidimensional process involving knowledge of children's developmental characteristics, individual differences, play, teacher scaffolding, interaction quality, assessment, inclusion, and contextual responsiveness.

Characteristics of the Reviewed Studies

The 17 studies represented diverse methodological approaches. Systematic reviews and meta-analyses constituted a substantial proportion of the evidence base, particularly studies investigating play-based learning, guided play, social-emotional learning (SEL), executive functions, teacher professional development, and teacher–child interaction. Qualitative and descriptive studies contributed evidence regarding teachers' beliefs, planning practices, implementation constraints, multicultural learning, and developmentally appropriate practice.

Table 1. Synthesis of the 17 Reviewed Articles

Authors & Year	Focus/Design	Main Conceptual or Empirical Findings	Implication for Developmentally Based Planning
Perlman et al. (2016)	Systematic review and meta-analysis of teacher–child interaction	Higher-quality staff–child interactions were positively associated with child developmental outcomes, although associations were generally small and heterogeneous.	Planning should explicitly include emotionally supportive, organizational, and instructional interactions rather than only learning content.
Pyle et al. (2017)	Scoping review; 168 studies	Play-based pedagogy supported both developmental and academic learning, but considerable variation existed in how teachers conceptualized and implemented play.	Teachers need to plan a continuum from child-directed play to more intentionally supported learning experiences.
Zosh et al. (2018)	Conceptual review	Play was conceptualized as a spectrum ranging from free play to guided play and games rather than as a single instructional form.	Planning should preserve child agency while varying adult guidance according to developmental and learning goals.
Yogman et al. (2018)	Clinical/ conceptual review	Play supports cognitive, language, social-emotional, executive-function, and self-regulatory development.	Play should be treated as a central developmental mechanism, not as an optional activity following formal instruction.
Blewitt et al. (2018)	Systematic review and meta-analysis; 79 studies	Curriculum-based SEL interventions produced improvements in social competence, emotional competence, behavioral self-regulation, and early learning outcomes.	Social-emotional objectives should be embedded in daily lesson planning alongside cognitive and language outcomes.

Egert et al. (2020)	Meta-analysis; 15 studies/18 treatments	Professional development significantly improved teacher–child interaction quality, with an overall effect of g = 0.39. Emotional support, classroom organization, and instructional support all improved.	Effective implementation requires teacher training, feedback, modeling, coaching, and reflective practice.
Blewitt et al. (2020)	Systematic review; 15 studies	Curriculum-based SEL programs tended to strengthen responsive teacher–child interactions and classroom management.	Developmentally based plans should specify how teachers will respond, scaffold, model emotions, and organize social interaction.
Scionti et al. (2020)	Systematic review and meta-analysis	Cognitive interventions produced significant improvements in several components of preschool executive function.	Planning should provide repeated opportunities for inhibitory control, working memory, flexible thinking, and problem solving.
Murano et al. (2020)	Meta-analysis; 48 studies, 15,498 children	Universal SEL interventions improved social-emotional skills (g = .34) and reduced problem behavior (g = .32); targeted interventions showed larger effects (g = .44–.50).	Plans should differentiate universal developmental stimulation from targeted support for children with additional needs.
Pauli-Pott et al. (2021)	Meta-analysis of 35 RCTs	Interventions improved working memory (d = .46), inhibitory control (d = .30), and cognitive flexibility (d = .47).	Developmental planning should include progressively challenging tasks matched to children's executive-function capacities.
Kasmiati (2021)	Descriptive qualitative study, Indonesia	Multicultural values could be integrated into weekly and daily early childhood lesson plans through explicit alignment of learning materials and activities.	Planning needs to incorporate children's cultural backgrounds and contextual values.
Skene et al. (2022)	Systematic review; 39 studies; meta-analysis of 17 studies, N = 3,893	Guided play outperformed direct instruction for early mathematics (g = .24), shape knowledge (g = .63), and task switching (g = .40), and exceeded free play for spatial vocabulary (g = .93).	Intentional adult guidance combined with child choice is an important strategy for developmentally responsive instruction.
Mengstie (2023)	Qualitative study of preschool teachers	Teachers expressed positive beliefs about DAP but did not consistently apply them because of large classes, inadequate resources, limited parental support, and administrative constraints.	Developmental planning must consider feasibility, teacher capacity, available resources, and classroom conditions.
von Suchodoletz et al. (2023)	Meta-analysis of ECEC quality and child outcomes	Process quality was significantly associated with children's academic achievement, social competence, behavioral outcomes, and social-emotional adjustment.	High-quality implementation processes are as important as curriculum content or written planning documents.
Taye et al. (2025)	Systematic review; 14 studies	Teachers supported DAP by creating safe environments, differentiating learning experiences, collaborating with families, and responding to children's interests and needs.	Planning should be individualized, family-connected, context-sensitive, and responsive to children's developmental variability.
Haris et al. (2025)	Systematic literature review on UDL in ECE	Universal Design for Learning supports participation of diverse learners through flexible representation, engagement, and expression.	Developmental planning should provide multiple pathways for accessing activities and demonstrating learning.

Evidence concerning teacher–child interaction consistently indicated that planning quality cannot be separated from interaction quality. Perlman et al. (2016) found positive, although generally modest, associations between CLASS-based interaction quality and children's outcomes, while Egert et al. (2020) demonstrated that professional-development interventions improved overall interaction quality by approximately g = 0.39. The latter

study reported effects across emotional support (g = 0.35), classroom organization (g = 0.30), and instructional support (g = 0.43), suggesting that developmentally based plans should anticipate not only activities but also the form of adult–child interaction occurring during implementation.

Developmental Principles Identified in the Literature

The thematic analysis produced six major developmental planning principles. First, learning should correspond to children's developmental characteristics rather than relying primarily on chronological curriculum targets. Second, children should remain active participants in learning. Third, learning experiences should integrate cognitive, linguistic, social, emotional, physical, and executive-function development. Fourth, instruction should accommodate individual and cultural diversity. Fifth, observation and assessment should guide subsequent planning. Sixth, implementation should be sufficiently flexible to allow teachers to modify activities according to children's responses.

The strong emphasis on play emerged consistently across the selected literature. Pyle et al. (2017), in their review of 168 studies, demonstrated that play may support developmental as well as academic outcomes but noted substantial conceptual differences in play-based pedagogy. Zosh et al. (2018) consequently proposed understanding play as a continuum, extending from free play to guided play and games with purposeful adult involvement. This conceptualization indicates that developmentally based planning should not position play and teacher instruction as mutually exclusive alternatives.

This interpretation was strongly supported by quantitative evidence from Skene et al. (2022). Their review identified 39 studies, while 17 studies involving 3,893 children were included in meta-analysis. Guided play showed significantly greater effects than direct instruction on early mathematics ($g = 0.24$, $p < .001$), shape knowledge ($g = 0.63$, $p = .007$), and task switching ($g = 0.40$). Guided play also exceeded free play in spatial vocabulary ($g = 0.93$). However, significant differences were not consistently found across literacy and socio-emotional outcomes, indicating that guided play should be matched to the developmental objective rather than assumed to be universally superior for every outcome.

Table 2. Major Principles of Developmentally Based Learning Planning

Developmental Principle	Evidence Across Studies	Planning Interpretation
Developmental appropriateness	Mengstie (2023); Taye et al. (2025)	Activities should reflect children's developmental level, interests, abilities, and individual needs.
Holistic development	Yogman et al. (2018); Murano et al. (2020); Scionti et al. (2020)	Plans should simultaneously address cognitive, social-emotional, language, physical, and self-regulatory domains.
Play-based learning	Pyle et al. (2017); Zosh et al. (2018); Skene et al. (2022); Nafisah et al. (2026)	Play should function as a principal learning medium, with varying levels of teacher guidance.
Responsive interaction	Perlman et al. (2016); Egert et al. (2020); Blewitt et al. (2020)	Teachers should intentionally plan questioning, feedback, emotional support, modeling, and scaffolding.
Diversity and inclusion	Kasmiati (2021); Haris et al. (2025)	Learning should allow cultural, developmental, ability-based, and experiential differences.
Contextual flexibility	Mengstie (2023); Taye et al. (2025)	Written plans should be adaptable to children's responses, resources, family conditions, and classroom realities.

Learning Strategies Identified in the Review

Four dominant instructional strategies emerged from the analysis: play-based learning, guided play and scaffolding, integrated social-emotional and cognitive stimulation, and differentiated/inclusive learning.

Play-based approaches were the most frequently represented strategy. The evidence suggests that effective play-based learning involves more than providing toys or allowing unrestricted free time. Instead, effective developmental planning establishes learning intentions, selects meaningful materials, organizes the physical and social environment, and determines appropriate levels of adult intervention.

Guided play appeared particularly valuable because it combines child agency with teacher intentionality. Teachers establish an environment or challenge related to a learning goal, while children retain meaningful choices concerning exploration and action. Adult intervention may involve prompts, open-ended

questions, modeling, feedback, or environmental modification. This model reflects the conceptual spectrum proposed by Zosh et al. (2018) and is supported empirically by Skene et al. (2022). A second strong pattern involved deliberate support for social-emotional development and self-regulation. Murano et al. (2020) synthesized 48 studies involving 15,498 preschool children and found that universal SEL interventions produced an overall effect of approximately g = 0.35, whereas targeted programs produced a larger overall effect of g = 0.48. These findings indicate that social-emotional outcomes should be translated into explicit learning opportunities rather than assumed to emerge automatically from classroom participation.

Executive-function evidence demonstrated a similar pattern. Pauli-Pott et al. (2021) synthesized 35 randomized controlled trials and observed positive intervention effects on working memory (d = .46, 95% CI [0.30, 0.61]), inhibitory control (d = 0.30, 95% CI [0.21, 0.38]), and cognitive flexibility (d = 0.47, 95% CI [0.28, .66]). Accordingly, developmentally appropriate plans should incorporate games involving rule switching, remembering instructions, waiting for turns, solving problems, and adapting strategies.

Table 3. Synthesis of Developmentally Appropriate Learning Strategies

Strategy	Teacher's Role	Child's Role	Expected Developmental Outcomes
Free and exploratory play	Arrange safe environment and materials; observe	Explore, choose, manipulate, imagine	Creativity, autonomy, social interaction
Guided play	Establish learning goals, scaffold, question, model	Make choices and actively investigate	Mathematics, language, problem solving, executive function
Project/inquiry experiences	Facilitate questions and investigations	Observe, test, discuss, construct meaning	Higher-order thinking and curiosity
Social-emotional learning	Model emotions, facilitate dialogue and cooperation	Recognize emotions, communicate, cooperate	Self-regulation, empathy, social competence
Executive-function activities	Provide rules, sequential challenges, and progressively complex tasks	Remember, inhibit, switch, solve problems	Working memory, inhibition, flexibility
Differentiated learning	Adjust materials, difficulty, time, and support	Participate according to developmental readiness	More equitable participation
Inclusive/UDL-oriented learning	Provide multiple means of engagement, representation, and expression	Select suitable access and response modes	Accessibility, participation, independence
Culturally responsive learning	Integrate family and cultural experiences	Connect learning with lived experience	Identity, tolerance, meaningful learning

Implementation of Developmentally Based Planning

The implementation findings revealed that an effective developmentally based lesson plan operates as an iterative cycle rather than a fixed instructional script. Across the reviewed evidence, the most consistent pattern involved: identifying developmental needs → defining integrated developmental goals → selecting meaningful play and learning experiences → organizing the environment and materials → implementing responsive teacher scaffolding → observing children's participation → documenting developmental evidence → adapting subsequent planning.

Indonesian evidence reinforced the need for contextualization. Kasmiati (2021) found that multicultural values could be deliberately embedded in weekly and daily learning plans, demonstrating that cultural development can be operationalized through learning objectives, content, activities, and classroom practices rather than remaining an abstract curriculum principle. Likewise, the Indonesian review by Nafisah et al. (2026) found that structured play-based approaches supported problem solving, logical thinking, and symbolic thinking, with educators and appropriate play materials functioning as important implementation factors.

The synthesis nevertheless identified an important implementation gap. Mengstie (2023) reported that preschool teachers generally expressed positive beliefs toward developmentally appropriate practice, yet classroom implementation did not consistently reflect those beliefs. Major constraints included shortages of resources, large class sizes, inadequate parental support, and administrative difficulties. Similarly, the review by Taye et al. (2025) emphasized that successful implementation depends on teachers' knowledge,

professional development, school culture, available resources, collaboration with families, and the capacity to provide learning experiences adapted to individual children.

Table 4. Implementation Framework Derived from the 17 Studies

Planning Stage	Core Activity	Developmental Basis	Expected Output
Developmental identification	Observe developmental achievements, needs, interests, and differences	Individual developmental variation	Child-development profile
Goal formulation	Establish integrated developmental outcomes	Holistic development	Cognitive, language, physical, social-emotional, and self-regulation goals
Activity selection	Select play, guided exploration, projects, stories, movement, and social interaction	Active and meaningful learning	Developmentally appropriate experiences
Environmental design	Arrange learning centers, play materials, accessibility, and social grouping	Environment as a developmental stimulus	Safe, flexible, inclusive classroom
Differentiation	Adapt task complexity, materials, support, and response modes	Individual differences and inclusion	Equitable participation
Responsive implementation	Scaffold, model, question, encourage, and provide feedback	Social interaction and guided participation	Active child engagement
Authentic assessment	Observe, document, collect work samples, and record developmental progress	Assessment for learning	Evidence of individual progress
Reflection and replanning	Interpret assessment information and revise subsequent activities	Development as a dynamic process	Responsive next-cycle lesson plan

Overall Empirical Synthesis

Across the 17 studies, four overarching patterns were identified. First, child-centeredness alone is insufficient unless it is accompanied by intentional pedagogical planning. Purely teacher-directed instruction can restrict autonomy, whereas completely unguided activities may not consistently produce targeted learning outcomes. The stronger model emerging from the literature combines children's active choice with purposeful adult scaffolding. Second, the results demonstrate that developmental outcomes are multidimensional and interdependent. Social-emotional interventions influence behavior and classroom participation, executive-function activities strengthen self-regulation and problem solving, and high-quality teacher–child interaction supports academic and social development. Murano et al. (2020), Pauli-Pott et al. (2021), and Skene et al. (2022) provide quantitative evidence that planned developmental interventions can generate small-to-moderate and, in selected domains, relatively substantial effects. Third, process quality emerged as a central mechanism connecting planning with developmental outcomes. Von Suchodoletz et al. (2023) reported associations between ECEC process quality and academic, behavioral, social, and emotional outcomes, reinforcing the view that a technically complete written lesson plan has limited developmental value when interactions and implementation are weak. Fourth, implementation depends heavily on teacher capacity and contextual resources. Professional development, coaching, reflection, classroom resources, manageable learning environments, institutional support, and family collaboration repeatedly emerged as enabling factors. Conversely, resource limitations, large classes, weak administrative support, and discrepancies between teacher beliefs and classroom practices constituted barriers.

Summary of Findings

Overall, the review demonstrates that developmentally based learning planning in early childhood education can be represented through the following integrated framework: Child Development Characteristics → Developmental Assessment → Integrated Learning Objectives → Play-Based and Guided Experiences → Responsive Teacher–Child Interaction → Inclusive and Contextual Adaptation → Authentic Assessment → Reflection and Replanning.

The synthesis therefore indicates that effective planning is not a linear preparation of learning content but a continuous developmental decision-making cycle. The most consistent evidence across the reviewed

studies supports learning plans that are child-centered yet intentional, play-oriented yet goal-directed, holistic rather than exclusively academic, inclusive of developmental diversity, culturally responsive, interaction-rich, and continuously adjusted using authentic assessment evidence. In practical terms, developmentally based planning becomes effective when the written curriculum, classroom environment, teacher behavior, children's active participation, and assessment process operate as an integrated pedagogical system.

Discussion

The findings of this review demonstrate that developmentally based learning planning in early childhood education should be understood as an adaptive pedagogical process rather than merely as the preparation of administrative lesson documents. Across the reviewed studies, effective planning consistently connected children's developmental characteristics, learning objectives, play experiences, teacher–child interaction, assessment, inclusion, and contextual adaptation. This interpretation is consistent with contemporary developmentally appropriate practice, which emphasizes age-related developmental patterns, individual variation, and sociocultural context as interconnected foundations for pedagogical decision-making (Mengstie, 2023; Taye et al., 2025). Similarly, Pyle et al. (2017), Zosh et al. (2018), Yogman et al. (2018), and Weisberg et al. (2016) position active engagement and play as central mechanisms through which young children construct knowledge. Thus, developmental planning should not begin exclusively with curriculum content but with systematic understanding of how individual children develop, interact, explore, and respond to learning experiences.

A major finding concerns the central role of play-based and guided learning. The reviewed evidence suggests that developmentally appropriate practice cannot be represented by an opposition between unrestricted play and formal teacher-directed instruction. Rather, effective pedagogy exists along a continuum of adult guidance and child agency. Pyle et al. (2017) found considerable variation in teachers' conceptualizations of play-based pedagogy, while Zosh et al. (2018) conceptualized playful learning as involving active, meaningful, socially interactive, iterative, and engaging experiences. This perspective is strengthened by Skene et al. (2022), whose meta-analysis showed that guided play produced better outcomes than direct instruction for early mathematics ($g = .24$), shape knowledge ($g = .63$), and task switching ($g = .40$), while outperforming free play for spatial vocabulary ($g = .93$). Recent Indonesian evidence similarly indicates that structured play contributes to problem solving, logical thinking, symbolic thinking, language, creativity, and holistic development (Khoirotin et al., 2025; Latifah et al., 2025; Nafisah et al., 2026; Setyowati et al., 2025). Consequently, learning planning should deliberately identify when children require autonomy, environmental stimulation, teacher questioning, modeling, or scaffolding rather than prescribing one pedagogical mode for all situations.

The results also highlight the importance of process quality and teacher–child interaction. A technically complete lesson plan does not automatically generate developmental benefits if classroom implementation is characterized by weak emotional support, limited dialogue, or insufficient cognitive stimulation. Ulferts et al. (2019) showed that higher ECEC process quality was longitudinally associated with language, literacy, and mathematics outcomes, while von Suchodoletz et al. (2023) reported significant associations between ECEC quality and literacy, mathematics, behavioral skills, social competence, and reduced social-emotional difficulties. A more recent CLASS-based meta-analysis involving 67,919 participants similarly found positive relationships between teacher–child interaction and language, mathematics, literacy, social development, and self-regulation. Egert et al. (2020) further demonstrated that professional development improved teacher–child interaction quality ($g = .39$), including emotional support, classroom organization, and instructional support. These findings reinforce research by Perlman et al. (2016), Blewitt et al. (2020), Pianta et al., and Hamre et al. that responsive interaction functions as a mechanism through which written planning becomes developmental experience.

Another important result is that developmentally based planning must address children's social-emotional development and executive functioning alongside academic readiness. Blewitt et al. (2018) reported that preschool SEL interventions significantly improved social competence, emotional competence, behavioral self-regulation, and early learning. Murano et al. (2020), analyzing 48 studies involving 15,498 children, similarly found positive effects of universal interventions on social-emotional competence ($g = 0.34$) and behavior problems ($g = 0.32$), with stronger effects for targeted interventions. These findings are consistent with Scionti et al. (2020), Pauli-Pott et al. (2021), and Savina (2021), who emphasize the developmental importance of working memory, inhibitory control, cognitive flexibility, and self-regulation. Pauli-Pott et al.

identified effects of d = 0.46 for working memory, d = 0.30 for inhibitory control, and d = 0.47 for cognitive flexibility. Therefore, lesson plans should intentionally incorporate turn-taking, remembering rules, emotion labeling, collaborative problem solving, delayed gratification, and flexible thinking rather than assuming these competencies will emerge spontaneously.

The synthesis additionally indicates that inclusive and culturally responsive planning is essential because developmental trajectories are not uniform. Children differ in language, ability, family experience, culture, interests, and opportunities for participation. Haris et al. (2025) and Jarar and Kurniawati (2025) show that Universal Design for Learning can support accessibility, autonomy, competence, and participation through flexible learning environments. Broader evidence from Almeqdad et al. (2023) and Zhang et al. (2024) similarly supports the potential of UDL while warning that its implementation requires stronger theoretical alignment, teacher preparation, and consistent application. Culturally responsive early childhood education also requires learning experiences to connect children's identities, families, languages, and community experiences with classroom activities (Thirumurthy & Brown, 2021; Kasmiati, 2021). Family engagement is particularly relevant because children's developmental experiences extend beyond school settings, as also indicated by Gross et al. (2020) and related ECEC family-engagement research.

Finally, the review reveals a persistent theory practice gap. Teachers may value child-centered and developmentally appropriate pedagogy while being unable to enact it consistently because of large class sizes, limited resources, insufficient professional development, administrative requirements, or weak family support (Mengstie, 2023; Taye et al., 2025). This suggests that improving planning cannot be achieved simply by prescribing more detailed lesson formats. Instead, institutions need to strengthen teachers' developmental knowledge, observational competence, reflective practice, pedagogical autonomy, professional learning, and access to appropriate materials.

Overall, the evidence supports a cyclical model of developmental observation → goal formulation → play-based and guided experiences → responsive interaction → authentic assessment → reflection and replanning. The principal contribution of this review is therefore to position developmentally based planning as an integrated system in which curriculum, play, assessment, interaction, inclusion, culture, and teacher professional competence operate together. Such a framework offers a stronger conceptual and empirical basis for designing early childhood education that is not only curriculum-aligned but genuinely responsive to the developmental realities of young children.

CONCLUSION

This literature review concludes that developmentally based learning planning in early childhood education should be understood as an integrated, responsive, and cyclical pedagogical process rather than merely as the preparation of administrative lesson documents. Based on the synthesis of 17 selected articles, effective planning consistently incorporated six major principles: developmental appropriateness, holistic development, play-based learning, responsive teacher–child interaction, inclusion and diversity, and contextual flexibility. Empirically, the reviewed evidence demonstrated that guided play produced positive effects on early mathematics (g = 0.24), shape knowledge (g = 0.63), task switching (g = 0.40), and spatial vocabulary (g = 0.93). Social-emotional learning interventions also improved children's competence and behavior, while executive-function interventions generated effects on working memory (d = 0.46), inhibitory control (d = 0.30), and cognitive flexibility (d = 0.47). Professional development further improved teacher–child interaction quality (g = 0.39).

Conceptually, these findings indicate that effective learning planning requires a continuous sequence of developmental observation, goal formulation, play-based and guided experiences, responsive interaction, authentic assessment, reflection, and replanning. The review also identified implementation barriers, including limited resources, large class sizes, insufficient professional development, and weak family support. Therefore, high-quality early childhood learning planning should be child-centered yet intentional, developmentally responsive, inclusive, culturally relevant, assessment-informed, and s

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