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Growth and Development Characteristics of Elementary School Students: Implications for Developmentally Appropriate Teaching Strategies

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Abstract: This literature review analyzes the characteristics of growth and development among elementary school students aged 6–12 years and examines their implications for teaching strategies in primary education settings. The school-age period represents a critical phase characterized by relatively stable physical growth and the cognitive transition toward the concrete operational stage, as described by Jean Piaget. Drawing upon primary sources from reputable educational journals and classical developmental psychology theories, this study identifies key patterns in physical, cognitive, social, and emotional development. The findings reveal that many learning difficulties observed in elementary classrooms stem not from low intellectual capacity but from a mismatch between instructional methods and students' developmental readiness. Effective teaching strategies must therefore integrate an understanding of fine motor skill development (particularly during the 8–9-year "golden period"), the need for concrete learning experiences, and attention to nutritional and environmental factors that influence developmental trajectories. The review emphasizes that synergy between teachers and parents is essential for creating a supportive ecosystem that optimizes children's holistic growth. Recommendations are provided for implementing developmentally appropriate practices that align pedagogical approaches with children's biological and psychological stages in both public and Islamic elementary schools.

Keyword : child development; elementary school students; concrete operational stage; developmentally appropriate practice; teaching strategies

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Introduction

Growth and development constitute two interrelated yet distinct processes that fundamentally shape a child's readiness to learn. Growth refers to quantitative changes, primarily in physical dimensions such as height, weight, and motor coordination. Development, by contrast, encompasses qualitative transformations in cognitive, social, emotional, and moral domains (Desmita, 2014; Hurlock, 1997). For educators at the elementary level, a nuanced understanding of these processes is indispensable for designing instruction that is both effective and humane. When teaching methods fail to account for developmental realities, children may experience unnecessary frustration, diminished self-esteem, and academic struggles that are often misattributed to limited intelligence rather than pedagogical mismatch.

The elementary school years (approximately ages 6–12) are marked by relatively stable physical growth compared to the rapid changes of early childhood or adolescence. However, this period features significant refinement in fine motor skills, particularly between ages 8 and 9, often described as a "golden stage" for developing manual dexterity essential for writing, drawing, and manipulating learning tools (Mulyani & Winarni, 2025; Gusneti et al., 2025). Concurrently, children transition into Piaget's concrete operational stage, gaining the ability to think logically about concrete objects and events while still struggling with abstract or hypothetical concepts (Rohmah et al., 2022; Santrock, 2018). This cognitive profile has profound implications for classroom practice: children learn best when concepts are anchored in tangible experiences, visual aids, and hands-on manipulation rather than through prolonged verbal exposition or abstract symbolic instruction.

Despite these well-established developmental principles, a persistent gap exists between curriculum expectations—which frequently emphasize abstract content, standardized testing, and rapid coverage of material—and the actual developmental capacities of students in this age group. Many elementary classrooms continue to rely heavily on lecture-style delivery and rote memorization, approaches that can induce cognitive fatigue and disengagement (Susanto & Wulandari, 2024). Furthermore, variations in nutritional status, environmental stimulation, and access to enriching experiences contribute to individual differences in developmental pace. Children who fall behind in fine motor coordination, attention regulation, or emotional self-management are at risk of being labeled as "slow learners" when the root causes often lie in unmet biological or ecological needs rather than inherent cognitive deficits (Fadlin, 2021; Soetjiningsih & Ranuh, 2015).

Developmental delays or challenges observed in elementary settings—such as difficulty sustaining attention, poor handwriting, limited emotional regulation, or low academic stamina—therefore require careful interpretation. These manifestations are frequently symptoms of deeper mismatches between the child's developmental profile and the instructional environment. Early identification and appropriate intervention, including improved nutrition, structured motor activities, and enriched sensory experiences, can prevent secondary problems such as diminished self-concept and social withdrawal (Aini, 2023).

This article aims to synthesize current understanding of physical, cognitive, and psychosocial development in elementary school students and to articulate practical implications for teaching strategies that are developmentally appropriate. By aligning pedagogical decisions with children's biological and psychological readiness, educators can reduce unnecessary learning barriers, foster intrinsic motivation, and support the holistic growth of every child. The discussion is particularly relevant for teachers in both public elementary schools (SD) and Islamic elementary schools (MI), where the integration of academic goals with character and spiritual development creates additional opportunities—and responsibilities—for responsive, child-centered practice.

Methodology

This study employed a qualitative literature review design focused on the growth and development characteristics of children aged 6–12 years and their educational implications. Data were collected through systematic documentation and analysis of primary sources, including peer-reviewed journal articles, authoritative textbooks in developmental psychology, and relevant policy documents related to elementary education in Indonesia. Sources were selected based on relevance to physical, cognitive,

social, and emotional development during the school-age period, with priority given to publications from 2018 onward that address contemporary challenges in primary education settings, supplemented by seminal theoretical works (e.g., Piagetian theory and classic developmental frameworks).

Analysis proceeded through a descriptive-analytical approach. Key themes were identified across sources, including patterns of physical and fine motor development, characteristics of concrete operational thinking, factors contributing to developmental variation or delay, and evidence-based pedagogical responses. Relationships between biological readiness and instructional design were examined to generate practical recommendations for teachers. The review emphasizes synthesis and implication rather than statistical meta-analysis, aiming to bridge theoretical knowledge with classroom application in both public and faith-based elementary school contexts.

Result and Discussion

Result

1. Physical Growth and Fine Motor Development

Physical growth during the elementary years proceeds at a steadier pace than in early childhood, providing a relatively stable platform for learning. However, significant qualitative advances occur in motor coordination, particularly in fine motor skills between ages 8 and 9. During this period, children typically gain precision in handwriting, drawing, cutting, and manipulating small objects—skills directly tied to academic tasks such as writing narratives, completing worksheets, and using mathematical manipulatives (Mulyani & Winarni, 2025). Physical activity and motor engagement are, moreover, closely linked to cognitive development and learning outcomes, underscoring the value of movement-rich classrooms for school-age children (Ruiyat, 2025). Schools that allocate intentional time for fine motor enrichment through drawing, crafts, and structured play activities report improvements not only in motor proficiency but also in concentration, creativity, and task persistence.

Nevertheless, a subset of students exhibits delays in fine motor development that can impede academic participation. These delays may stem from insufficient prior stimulation, nutritional deficiencies affecting neuromuscular maturation, or limited opportunities for practice at home. When such children are expected to produce neat handwriting or complete intricate written tasks without adequate support, they often experience repeated failure, leading to frustration and avoidance behaviors. The literature consistently indicates that motor skill difficulties should be addressed through targeted, playful interventions rather than punitive measures or increased academic pressure (Gusneti et al., 2025). Providing varied materials—such as playdough, pegboards, and textured tracing activities—can simultaneously build fine motor control and maintain children's engagement and positive self-perception.

2. Cognitive Development and the Concrete Operational Stage

According to Piaget's theory of cognitive development, children aged approximately 7–11 years operate within the concrete operational stage. They demonstrate logical thinking when working with tangible objects and real-world situations but continue to struggle with abstract, hypothetical, or purely verbal propositions (Rohmah et al., 2022; Santrock, 2018). This stage is characterized by the emergence of conservation, classification, seriation, and reversibility—mental operations that enable children to understand mathematical concepts

such as number, measurement, and basic geometry when these are presented through concrete materials.

A critical implication for teaching is that abstract instruction—delivered primarily through lengthy verbal explanations or decontextualized symbols—frequently exceeds students' current operational capacity. When teachers rely predominantly on chalk-and-talk methods or expect rapid mastery of abstract rules without manipulative support, many children experience cognitive overload. The resulting fatigue and disengagement are often misinterpreted as laziness or low ability. Research on developmentally appropriate practice underscores that effective instruction at this stage bridges new concepts to children's existing concrete experiences through the use of real objects, diagrams, models, educational games, and hands-on experiments (Susanto & Wulandari, 2024). Scaffolding techniques—in which teachers provide structured, temporary support that is gradually withdrawn as competence grows—have likewise been shown to strengthen foundational skills such as numeracy in young learners (Rohani et al., 2025). For example, teaching multiplication through grouping physical counters or exploring volume by filling and comparing containers yields deeper understanding and retention than presenting formulas in isolation.

3. Factors Contributing to Developmental Challenges

Individual differences in developmental pace arise from the dynamic interplay of genetic, nutritional, environmental, and experiential factors. Inadequate nutritional intake—particularly deficiencies in iron, iodine, and essential fatty acids—can impair attention, memory, and overall cognitive stamina (Soetjiningsih & Ranuh, 2015). Similarly, limited access to stimulating home environments, excessive screen time replacing active play, and insufficient sleep compromise both physical vitality and emotional regulation. Children entering school with these cumulative disadvantages often display lower academic stamina, difficulty following multi-step instructions, and heightened emotional reactivity—behaviors that, without proper contextual understanding, may be attributed to character flaws or intellectual limitations (Fadlin, 2021).

Social and emotional dimensions further mediate learning readiness. Students who experience chronic criticism, comparison with peers, or fear of failure frequently develop defensive patterns such as task avoidance, perfectionism, or social withdrawal. These responses are protective mechanisms rather than indicators of low motivation. Creating psychologically safe classrooms—where effort is recognized, mistakes are treated as learning opportunities, and diverse paces are respected—has been shown to restore engagement and self-efficacy (Aini, 2023). Teacher attitudes matter here as well: genuine appreciation and encouragement of students strengthen motivation and the teacher–student relationship that underpins learning (Khaerunnisa et al., 2024). Inclusive practices that celebrate incremental progress and provide multiple pathways to demonstrate understanding are therefore not merely supportive but essential for equitable learning outcomes.

Discussion

1. Implications for Developmentally Appropriate Teaching Strategies

The synthesis of developmental research points toward several evidence-based shifts in instructional practice. First, teachers should prioritize concrete, experiential learning as the primary vehicle for introducing new concepts, especially in mathematics, science, and language arts. Manipulatives, visual representations, and real-life problem contexts help children construct understanding rather than merely memorize procedures. Structured reading strategies suited to the concrete operational stage, such as the SQ3R method, can likewise improve reading comprehension among elementary students (Putri et al., 2025). Second, fine motor development must be intentionally

supported through daily opportunities for drawing, crafting, and precise manipulation, integrated across subject areas rather than treated as isolated "art time." Third, assessment practices should move beyond narrow paper-and-pencil tests to include observation of how children engage with concrete tasks, collaborate with peers, and apply concepts in novel situations.

Developmentally appropriate pedagogy must also be responsive to the cultural and social diversity of elementary classrooms. Multicultural and inclusive approaches that build harmony amid diversity help ensure that every child, regardless of background, can participate meaningfully and feel valued (Jajat & Somantri, 2025). For teachers in both public elementary schools (SD) and Islamic elementary schools (MI), these principles hold particular relevance. In MI settings, the integration of Islamic values—such as patience (*sabr*), diligence, and respect for knowledge—can naturally reinforce growth-mindset messages and emotional resilience when framed within developmentally appropriate activities. The increasing use of digital management and learning systems in Islamic primary education also offers new avenues for organizing developmentally responsive instruction and family communication (Supriatna, 2025). Character education and religious instruction become more impactful when delivered through stories, role-play, and hands-on projects rather than didactic lectures alone. Across both school types, the core message remains consistent: effective teaching begins with the child's current developmental reality and scaffolds new learning from that foundation.

2. The Essential Role of Teacher–Parent Synergy

No school-based intervention can fully compensate for the absence of supportive conditions at home. Parents play a decisive role in providing adequate nutrition, consistent sleep routines, opportunities for active play, and emotionally responsive interactions. When teachers and parents establish regular communication—through meetings, shared observation notes, or simple progress portfolios—developmental concerns can be identified earlier and addressed collaboratively. Such partnerships also help align expectations: parents come to understand why hands-on learning and play are not "wasted time" but essential for brain development, while teachers gain insight into the child's home context that may explain classroom behaviors. Ultimately, the most powerful protective factor for children's healthy development is a coherent ecosystem in which family and school work in concert rather than at cross-purposes (Desmita, 2014).

Conclution

The growth and development of elementary school students form an integrated whole in which physical, cognitive, social, and emotional dimensions continually influence one another. This review demonstrates that many observed learning difficulties and behavioral challenges in primary classrooms originate from a mismatch between conventional teaching practices and children's developmental characteristics—particularly their need for concrete experiences, fine motor support, and emotionally safe environments—rather than from deficits in intelligence. When educators design instruction that respects the concrete operational stage, provides intentional motor enrichment, addresses nutritional and environmental influences, and fosters genuine partnership with families, children are far more likely to thrive academically, socially, and emotionally.

For both public elementary schools and Islamic elementary schools, the path forward requires a deliberate shift from content-centered, one-size-fits-all approaches

toward developmentally appropriate, child-responsive pedagogy. This shift is not merely a technical adjustment but a philosophical reorientation that places the child's holistic well-being at the center of educational decision-making. Future efforts should focus on sustained professional development for teachers in observing developmental milestones, implementing concrete learning experiences, and building effective family engagement strategies. Only through such comprehensive attention to children's developmental realities can elementary education fulfill its promise of nurturing capable, confident, and well-rounded individuals ready for the challenges of subsequent learning stages.

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