

Research Article

Teaching strategies in preschool and primary education: insights from international research

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Abstract. This study provides a comprehensive synthesis of internationally recognized evidence on effective teaching strategies in preschool and primary education. The primary objective is to identify the psychological, pedagogical, and social determinants of successful learning during early childhood and to critically examine the theoretical and empirical foundations of play-based, differentiated, learner-centered, and collaborative instructional approaches. The analysis integrates influential educational frameworks, including Hattie's *Visible Learning* model, UNESCO and OECD policy reports, Hirsh-Pasek and Golinkoff's play-based learning paradigm, Marzano's evidence-based instructional framework, the school engagement model proposed by Fredricks, Blumenfeld, and Paris, and neurodevelopmental research conducted by the Harvard Center on the Developing Child. Comparative analysis demonstrates that emotional security, active learner engagement, positive classroom climate, and high-quality teacher-student interactions constitute the principal determinants of children's cognitive, social, and academic development. The study concludes by presenting evidence-informed recommendations for strengthening pedagogical practice and improving educational quality in preschool and primary education.

Keywords: early childhood education, primary education, instructional strategies, play-based learning, learner-centered education.

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Research Methodology

This study adopts a qualitative research design based on a systematic literature review and comparative analytical methodology. The research aims to synthesize international empirical evidence on contemporary teaching strategies implemented in preschool and primary education and to identify the pedagogical mechanisms through which these approaches influence children's learning outcomes. To achieve this objective, peer-reviewed journal articles, international policy reports, meta-analyses, theoretical studies, and evidence-based educational frameworks published by internationally recognized organizations and leading scholars were critically reviewed and comparatively analyzed. The methodological approach emphasizes conceptual synthesis rather than statistical aggregation, allowing the integration of findings from diverse educational contexts while identifying common pedagogical principles associated with effective early childhood teaching and learning.

Problem Statement

Within contemporary education systems, preschool and primary education are widely recognized as the foundational stages of children's cognitive, emotional, social, and personal development. The instructional strategies implemented during these early years establish the basis for subsequent academic achievement, school engagement, lifelong learning competencies, and intrinsic motivation. A growing body of international research demonstrates that experiences during early childhood exert long-lasting effects on learners' educational trajectories and overall well-being (Hattie, 2009; OECD, 2017; UNESCO, 2022).

Despite these well-established findings, recent empirical evidence indicates a persistent mismatch between the instructional approaches employed in many preschool and primary classrooms and children's developmental needs. In educational environments where teacher-centered, content-transmission models continue to dominate, opportunities for active participation, creative thinking, autonomy, and emotional well-being are frequently limited. Such pedagogical practices have been associated with reduced academic motivation, lower levels of school engagement, increased behavioral difficulties, and predominantly surface-level learning outcomes (Fredricks et al., 2004; Marzano, 2007; Schleicher, 2018).

In contrast, contemporary international research consistently demonstrates the effectiveness of play-based learning, learner-centered pedagogy, differentiated instruction, positive behavior support, collaborative learning, and social-emotional learning in fostering holistic child development. These approaches enhance not only academic performance but also executive functioning, creativity, communication skills, self-regulation, resilience, and socio-emotional competence during early childhood (Hirsh-Pasek & Golinkoff, 2009; Harvard Center on the Developing Child, 2016; Buldu & Buldu, 2025; O'Keeffe et al., 2026).

Although these instructional models have been extensively investigated individually, comparatively few studies have synthesized their collective contribution to emotional security, school engagement, academic achievement, and positive classroom climate within a unified conceptual framework. Moreover, limited attention has been devoted to examining how internationally validated pedagogical models can inform educational practice in different national contexts, particularly in developing education systems. These theoretical and practical gaps underscore the significance and timeliness of the present investigation.

Accordingly, the central research problem addressed in this article is formulated as follows:

What are the pedagogical mechanisms through which instructional strategies implemented in preschool and primary education influence children's academic achievement, school engagement, and the development of positive learning environments?

Introduction

Educational quality has become one of the principal determinants of intellectual, social, and economic development in contemporary societies. Within this broader educational landscape, preschool and primary education occupy a particularly critical position, as these stages provide the foundations for children's cognitive growth, socio-emotional competence, behavioral regulation, and lifelong learning dispositions. The quality of educational experiences during early childhood substantially influences subsequent academic success, adaptability, creativity, and participation in society (OECD, 2017; UNESCO, 2022).

As Fatma Bünyatova, founder of the *Idrak School* and developer of the *Idrak* pedagogical model, argues, instructional strategies constitute the educational framework through which desired learning outcomes are systematically achieved (Bünyatova, 2008). From a contemporary pedagogical perspective, effective instructional strategies extend far beyond the transmission of knowledge; they create learning environments that actively promote children's intellectual, emotional, social, and creative development.

International evidence consistently demonstrates that the selection of appropriate teaching strategies during early childhood significantly improves not only academic achievement but also children's creativity, critical thinking, problem-solving ability, communication skills, self-regulation, and independent learning. Over the past two decades, extensive empirical research has confirmed the educational value of play-based learning, differentiated instruction, collaborative learning, inquiry-based pedagogy, formative assessment, and emotionally supportive classroom environments in preschool and primary education (Hattie, 2009; Marzano, 2007; Hirsh-Pasek & Golinkoff, 2009; Buldu & Buldu, 2025).

Among the most influential international contributions are the OECD *Starting Strong* reports, UNESCO's global reviews of early childhood education, and the neurodevelopmental research conducted by the Harvard Center on the Developing Child. Collectively, these studies demonstrate that early childhood education should be conceptualized not merely as a process of academic knowledge acquisition but as a comprehensive developmental system that simultaneously supports cognitive, emotional, linguistic, social, and behavioral development. They further emphasize that emotionally secure learning environments, responsive teacher-child interactions, and developmentally appropriate pedagogies constitute essential prerequisites for children's long-term educational success (Harvard Center on the Developing Child, 2016; OECD, 2017; UNESCO, 2022).

Nevertheless, in many educational systems, particularly those undergoing educational reform, teacher-centered, memory-oriented, and highly standardized instructional practices continue to predominate. Such approaches frequently constrain children's natural curiosity, intrinsic motivation, creativity, and active engagement in learning. Consequently, educational outcomes may become limited to short-term knowledge acquisition rather than the development of higher-order thinking, problem-solving abilities, and lifelong learning competencies (Schleicher, 2018; Mikayilli, 2025).

Recent research has increasingly advocated for learner-centered educational models that position children as active constructors of knowledge rather than passive recipients of information. Evidence suggests that classrooms characterized by active participation, meaningful interaction, collaborative inquiry, differentiated support, and playful learning are associated with significantly higher levels of academic achievement, school engagement, and socio-emotional well-being (Fredricks et al., 2004; Ring, 2025; Buldu & Buldu, 2025; O'Keeffe et al., 2026).

Against this background, the present study aims to critically synthesize international evidence regarding instructional strategies employed in preschool and primary education, identify their pedagogical strengths and limitations, and develop evidence-informed recommendations for educational practice. Through a comparative analysis of international research findings, the study also examines the complex interaction between psychological, pedagogical, and social factors that shape effective teaching and learning during early childhood, thereby contributing to the advancement of evidence-based educational policy and classroom practice.

Discussion

The synthesis of international research demonstrates that the effectiveness of instructional strategies in preschool and primary education is fundamentally determined by children's level of engagement, the quality of the learning environment, teachers' pedagogical competence, and the provision of emotionally secure classroom settings. Contemporary educational research consistently argues that teaching should not be viewed merely as the transmission of knowledge but rather as a multidimensional developmental process that simultaneously promotes children's cognitive, social, emotional, and behavioral growth (OECD, 2017; UNESCO, 2022; Schleicher, 2018).

One of the most influential bodies of evidence in this field is John Hattie's comprehensive synthesis of more than 800 meta-analyses on educational achievement. His findings indicate that formative feedback, clarity of learning intentions, visible learning processes, teacher expectations, and high-quality teacher–student interactions exert some of the strongest positive effects on learners' academic achievement. These findings provide robust empirical support for replacing traditional teacher-centered instruction with learner-centered pedagogical strategies that actively engage children in constructing knowledge (Hattie, 2009).

The strategic importance of early childhood education is further emphasized in UNESCO's global reports, which characterize high-quality preschool education as one of the most effective long-term investments in human development. According to UNESCO, equitable access to quality early childhood education contributes significantly to educational equity, social inclusion, sustainable development, and the formation of human capital. Rather than functioning solely as preparation for formal schooling, preschool education should be understood as the foundation for lifelong learning and holistic child development (UNESCO, 2022). Similar conclusions are presented in the OECD *Starting Strong* reports, which identify play-based learning, differentiated instruction, child-centered pedagogy, and collaborative learning as developmentally appropriate strategies that align with children's natural cognitive processes. OECD evidence demonstrates that these approaches enhance not only academic performance but also social adaptation, communication skills, and emotional well-being (OECD, 2017; Schleicher, 2018).

The pedagogical value of play-based learning has been extensively documented in contemporary developmental and educational research. Hirsh-Pasek, Golinkoff, Berk, and Singer argue that guided play creates optimal conditions for the development of language, executive functions, creativity, problem-solving abilities, self-regulation, and social competence. More recent empirical investigations likewise confirm that playful learning environments significantly improve children's motivation, engagement, inclusion, and higher-order thinking skills while fostering meaningful learning experiences (Hirsh-Pasek & Golinkoff, 2009; Buldu & Buldu, 2025; O'Keeffe et al., 2026; Ring, 2025; National Association for the Education of Young Children [NAEYC], 2022). These findings collectively suggest that play-based learning should be regarded not as an optional instructional technique but as a fundamental pedagogical principle underpinning effective early childhood education.

From the perspective of instructional design, Marzano's evidence-based teaching framework provides another influential contribution. Marzano argues that clearly articulated learning goals, systematic formative assessment, continuous feedback, reflective practice, and positive classroom climate substantially improve learners' motivation, responsibility, and academic achievement. His model highlights that sustainable improvements in educational outcomes cannot be achieved without establishing supportive behavioral environments that encourage positive interpersonal relationships and active participation. Consequently, the sequence **positive classroom climate** → **productive learning environment** → **improved academic achievement** represents one of the central mechanisms underlying effective teaching (Marzano, 2007).

The strategic transformation of educational systems has also been examined by Andreas Schleicher, who argues that traditional standardized instructional models are increasingly insufficient for developing the competencies required in the twenty-first century. According to Schleicher, contemporary education should prioritize creativity, critical thinking, collaboration, communication, adaptability, and lifelong learning rather than rote memorization and

passive knowledge acquisition. These arguments strongly support the implementation of flexible, adaptive, and learner-centered instructional strategies from the earliest stages of education (Schleicher, 2018).

Within the Azerbaijani educational context, Fatma Bünyatova's constructivist instructional technology represents an important national contribution to contemporary pedagogy. Her model redefines educational objectives by shifting the emphasis from the simple transmission of knowledge, skills, and habits toward learners' ability to construct meaning, apply knowledge creatively, solve problems, and generate new understandings. This philosophical orientation is highly consistent with international constructivist perspectives and contemporary evidence supporting inquiry-based, learner-centered, and play-based pedagogies (Bünyatova, 2008; Buldu & Buldu, 2025; O'Keeffe et al., 2026; Ring, 2025).

Within this constructivist framework, learning content is organized as integrated conceptual systems rather than fragmented information. Such organization enables learners to establish meaningful conceptual relationships, promotes deeper understanding, and facilitates knowledge transfer across contexts. Consequently, instructional efficiency increases while learners acquire more coherent and transferable knowledge structures. In this regard, constructivist pedagogy contributes not only to improved academic performance but also to the development of analytical reasoning, independent thinking, creativity, and intellectual autonomy (Najafov, 2025; Buldu & Buldu, 2025; Ring, 2025).

Another significant implication of Bünyatova's instructional technology concerns learners' self-awareness, self-regulation, and lifelong learning orientation. Instead of functioning as passive recipients of information, students become active participants who continuously inquire, reflect, evaluate, and construct knowledge. Accordingly, constructivist instruction should be understood as a comprehensive pedagogical system that promotes intellectual independence alongside academic achievement and personal development (Bünyatova, 2008; Najafov, 2025).

Student engagement constitutes another critical dimension of instructional effectiveness. Fredricks, Blumenfeld, and Paris conceptualize engagement as a multidimensional construct comprising behavioral, emotional, and cognitive components. Their model demonstrates that emotionally engaged learners who actively participate in classroom activities and invest cognitively in learning consistently achieve higher academic outcomes than disengaged peers. School engagement therefore represents both an educational objective and a powerful predictor of academic success (Fredricks et al., 2004).

Complementing these educational perspectives, neurodevelopmental research conducted by the Harvard Center on the Developing Child demonstrates that emotionally supportive learning environments significantly influence early brain development. The well-established "**Serve and Return**" model illustrates how responsive interactions between adults and children strengthen neural architecture responsible for language acquisition, memory, attention, executive functioning, and self-regulation. These findings provide compelling neuroscientific evidence supporting emotionally responsive and relationship-based pedagogies during early childhood (Harvard Center on the Developing Child, 2016).

The psychological foundations of contemporary instructional strategies are further reinforced by Lev Vygotsky's theory of the **Zone of Proximal Development (ZPD)**. According to Vygotsky, children's development should be understood not only in terms of what they can accomplish independently but also in terms of what becomes possible through guidance from teachers or more capable peers. This theoretical perspective underpins modern instructional practices such as scaffolding, differentiated instruction, guided participation, and adaptive teaching. Recent educational research continues to confirm that these approaches effectively accommodate individual developmental differences while maximizing learning potential in preschool and primary education (Vygotsky, 1999; OECD, 2017; Buldu & Buldu, 2025).

Similarly, Elkonin's developmental theory identifies play as the leading activity during early childhood. He argues that through role-playing and symbolic play, children develop imagination, voluntary self-regulation, social

competence, communication skills, and higher-order cognitive processes. Consequently, play should not be regarded merely as recreational activity but rather as a scientifically grounded pedagogical mechanism through which children's psychological and social development is facilitated. Elkonin's theoretical framework therefore provides one of the strongest psychological justifications for integrating structured play into preschool and primary education curricula (Elkonin, 1989; Hirsh-Pasek & Golinkoff, 2009; NAEYC, 2022).

Overall, the international evidence reviewed in this study converges toward a common conclusion: effective instructional strategies in preschool and primary education are characterized by learner-centeredness, emotional responsiveness, developmental appropriateness, active participation, differentiation, and meaningful teacher–child interaction. The convergence of educational psychology, neuroscience, developmental theory, and international educational policy demonstrates that sustainable improvements in children's academic achievement are inseparable from their social, emotional, and cognitive development. Consequently, future educational reforms should prioritize integrated pedagogical models that simultaneously cultivate academic excellence, emotional well-being, creativity, and lifelong learning competencies (Hattie, 2009; UNESCO, 2022; OECD, 2017; Schleicher, 2018; Buldu & Buldu, 2025; O'Keeffe et al., 2026; Ring, 2025).

Table 1. International Evidence on Effective Teaching Strategies in Preschool and Primary Education

Teaching Strategy	Core Characteristics	Educational Outcomes	Representative Studies
Play-based learning	Guided play, exploration, experiential learning, child autonomy	Enhances language development, executive functioning, creativity, self-regulation, and social competence	Hirsh-Pasek & Golinkoff (2009); Buldu & Buldu (2025); O'Keeffe et al. (2026); Ring (2025); NAEYC (2022)
Learner-centered instruction	Active participation, inquiry, autonomy, personalized learning	Improves academic achievement, motivation, critical thinking, and lifelong learning skills	Hattie (2009); Schleicher (2018); Marzano (2007)
Differentiated instruction	Adaptive teaching according to learners' readiness, interests, and abilities	Supports inclusive education, reduces achievement gaps, promotes individual progress	OECD (2017); Vygotsky (1999); Schleicher (2018)
Collaborative learning	Peer interaction, teamwork, dialogue, shared problem-solving	Develops communication, cooperation, leadership, and social responsibility	OECD (2017); Fredricks et al. (2004)
Positive classroom climate	Emotional safety, supportive teacher–student relationships, positive behavior support	Increases engagement, well-being, classroom participation, and academic success	Harvard Center on the Developing Child (2016); Marzano (2007); UNESCO (2022)
Constructivist instruction	Knowledge construction, reflection, conceptual	Strengthens analytical thinking, creativity,	Bünyatova (2008); Najafov (2025); Buldu & Buldu (2025)

	understanding, authentic learning	independent learning, and metacognitive skills	
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Table 2. Synthesis of International Research Findings on Determinants of Educational Effectiveness in Early Childhood Education

Determinant	Underlying Mechanism	Impact on Child Development	Supporting Evidence
Teacher–student interaction	Responsive communication, formative feedback, emotional support	Higher academic achievement, stronger motivation, improved engagement	Hattie (2009); Harvard Center on the Developing Child (2016)
Emotional security	Safe, supportive, and predictable learning environment	Better self-regulation, reduced stress, improved executive functioning	Harvard Center on the Developing Child (2016); UNESCO (2022)
Active learner engagement	Behavioral, emotional, and cognitive participation	Increased school engagement, persistence, and learning outcomes	Fredricks et al. (2004); Hattie (2009)
Play and exploration	Learning through meaningful and developmentally appropriate experiences	Improved creativity, language, problem-solving, and socio-emotional development	Hirsh-Pasek & Golinkoff (2009); Buldu & Buldu (2025); O'Keeffe et al. (2026)
Differentiated support (Scaffolding)	Instruction matched to learners' developmental needs	Accelerated cognitive development and independent learning	Vygotsky (1999); OECD (2017)
Positive behavior support	Clear expectations, respectful classroom management, reflective practice	Improved classroom climate, reduced behavioral problems, enhanced achievement	Marzano (2007); UNESCO (2022)
Family and social environment	Consistent collaboration between school and home	Improved school readiness, resilience, and long-term educational success	OECD (2017); UNESCO (2022)
Evidence-based instructional planning	Goal-oriented teaching, continuous assessment, adaptive pedagogy	Sustainable improvement in learning quality and educational effectiveness	Hattie (2009); Schleicher (2018); Mikayilli (2025)

Conclusions

The systematic synthesis of theoretical and empirical international research demonstrates that the effectiveness of instructional strategies in preschool and primary education is fundamentally determined by children's active engagement, emotional security, the quality of teacher–student relationships, and the overall learning environment.

Collectively, the reviewed evidence confirms that early childhood education should not be conceptualized merely as a process of knowledge transmission but rather as a comprehensive developmental system that simultaneously promotes children's cognitive, social, emotional, and personal development (Hattie, 2009; OECD, 2017; UNESCO, 2022).

The findings derived from Hattie's synthesis of more than 800 meta-analyses indicate that clearly defined learning intentions, high-quality formative feedback, active learner participation, and effective teacher–student interaction represent the instructional factors with the greatest influence on academic achievement. These findings provide compelling empirical evidence supporting the superiority of learner-centered pedagogical approaches over traditional teacher-centered models (Hattie, 2009).

Comparative analysis of UNESCO and OECD reports further demonstrates that high-quality preschool education constitutes one of the strongest predictors of subsequent academic success, social inclusion, and human capital development. Developmentally appropriate instructional strategies—particularly play-based learning, differentiated instruction, collaborative learning, and learner-centered pedagogy—not only enhance children's academic performance but also strengthen communication skills, self-regulation, creativity, and socio-emotional competence (OECD, 2017; UNESCO, 2022; Schleicher, 2018).

Research conducted by Hirsh-Pasek, Golinkoff, and colleagues consistently demonstrates that play-based learning environments substantially enhance executive functioning, language development, self-regulation, problem-solving, and social interaction. Recent international studies likewise confirm that guided play represents a pedagogical necessity rather than an optional instructional technique in contemporary preschool and primary education (Hirsh-Pasek & Golinkoff, 2009; Buldu & Buldu, 2025; O'Keeffe et al., 2026; Ring, 2025).

The constructivist instructional technology developed by Fatma Bünyatova also offers valuable pedagogical implications. By emphasizing conceptual understanding, meaningful learning, creative knowledge construction, and learner autonomy, this model facilitates deeper cognitive processing while simultaneously promoting analytical thinking, independent reasoning, and lifelong learning competencies. These characteristics closely correspond with internationally recognized constructivist principles and contemporary evidence-based instructional practices (Bünyatova, 2008; Najafov, 2025).

Furthermore, Marzano's instructional framework demonstrates that sustainable improvements in academic achievement cannot be achieved without establishing positive behavioral environments and supportive classroom climates. The sequence **positive behavior** → **productive learning environment** → **academic achievement** therefore represents one of the central mechanisms through which instructional quality influences educational outcomes (Marzano, 2007).

The multidimensional model of school engagement proposed by Fredricks, Blumenfeld, and Paris indicates that behavioral, emotional, and cognitive engagement collectively function as strong predictors of children's academic performance. Complementary findings from developmental neuroscience further demonstrate that emotionally responsive learning environments significantly influence early brain development. The Serve and Return framework developed by the Harvard Center on the Developing Child illustrates how responsive adult–child interactions strengthen executive functions, language acquisition, attention regulation, memory, and self-regulatory capacities during early childhood (Fredricks et al., 2004; Harvard Center on the Developing Child, 2016).

Finally, the theoretical perspectives advanced by Vygotsky and Elkonin provide robust psychological foundations for contemporary instructional strategies. Vygotsky's Zone of Proximal Development supports differentiated instruction and scaffolded learning, while Elkonin's theory of play establishes structured play as a principal mechanism through which children's cognitive, social, and emotional development is facilitated. Together, these theoretical frameworks continue to inform evidence-based pedagogical practice in preschool and primary education (Vygotsky, 1999; Elkonin, 1989).

Overall conclusions

The findings of this review support several major conclusions:

- Learner-centered, play-based, constructivist, and differentiated instructional strategies consistently demonstrate the highest levels of pedagogical effectiveness in preschool and primary education.
- Emotionally supportive classroom environments and high-quality teacher–student relationships constitute fundamental prerequisites for sustainable academic achievement and holistic child development.
- Instructional experiences during early childhood significantly influence children's long-term educational trajectories, cognitive development, socio-emotional competence, and lifelong learning dispositions.
- Contemporary educational effectiveness should be evaluated not only through academic performance but also through indicators of well-being, school engagement, creativity, self-regulation, and social-emotional development.
- The convergence of findings from educational psychology, developmental neuroscience, and international educational policy supports the implementation of integrated pedagogical models that simultaneously promote academic excellence and holistic child development.

Overall, the international evidence reviewed in this study demonstrates that the systematic implementation of modern, flexible, learner-centered, evidence-based, and play-oriented instructional strategies represents one of the most effective pathways for improving the quality, equity, and sustainability of preschool and primary education. Future educational reforms should therefore prioritize pedagogical models that integrate cognitive, emotional, social, and behavioral dimensions of learning while responding to the diverse developmental needs of young children (Hattie, 2009; OECD, 2017; UNESCO, 2022; Buldu & Buldu, 2025; O'Keeffe et al., 2026; Ring, 2025).

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