WHITE PAPER

Playful Learning, Actionable Data: Hatch Early Learning's Pedagogical Philosophy

Explore the principles that influence curriculum design, instructional methodologies, and assessment practices for Hatch™ products.

By Kylie Rymanowicz, Senior Manager of Curriculum at Hatch Early Learning

Executive Summary

Introduction

In today's dynamic educational environment, a well-defined pedagogical philosophy is crucial for creating effective learning experiences. This philosophy serves as a guiding framework for instructional practices, curriculum design, and assessment, aligning educational efforts with student development goals. This Hatch Early Learning white paper aims to provide educators and stakeholders with a clear understanding of our pedagogical approach, detailing our core principles, instructional framework, and the practical implementation of these elements. Through explanations, examples, and evidence of impact, the paper will demonstrate how our philosophy supports diverse student needs and enhances teaching and learning.

Hatch Early Learning is a leading provider in early childhood education, offering interactive solutions that deliver actionable data on student readiness in math, literacy, language, and other developmental areas. Our research-based, standards-aligned tools help educators gain insights into student progress, allowing for informed decision-making, differentiated instruction, and effective collaboration with families. Additionally, Hatch's platforms streamline data management and reduce administrative tasks, enabling educators to concentrate more on teaching and creating a supportive learning environment.

Pedagogical Philosophy Overview

At Hatch Early Learning, we develop innovative, research-based early-learning solutions to ensure every student's success in school. We view fostering holistic child development as a serious responsibility, guided by research, empirical evidence, and best practices. Our approach aims to ignite learning and address the achievement gap effectively.

Our pedagogical philosophy is built on three core areas: approaches to education, insights and analytics, and community-connected learning.

Approaches to Education

In early childhood education, a comprehensive teaching approach is crucial for holistic child development. Hatch Early Learning's methodologies focus on nurturing cognitive, social, emotional, and physical growth through developmentally appropriate practices tailored to each child's needs. Central to our philosophy is purposeful practice, which involves repetitive, skill-building activities, and "joyful rigor," where engaging, enjoyable activities support rigorous academic learning in math and literacy. We emphasize play-based, child-led exploration, allowing children to discover and experiment in a stimulating environment. These approaches help develop well-rounded, curious, and capable learners.

Whole-child development: This approach integrates social, emotional, mental, and physical growth with academics, enhancing overall well-being and academic performance. Hatch's solutions support this by providing research-based content that promotes academic rigor, social–emotional skills, interactive play, and personalized learning paths.

Developmentally appropriate learning: This approach creates safe, supportive environments for optimal child development through strengths-based, play-based learning. Hatch supports this by offering personalized learning paths, bilingual activities, real-time progress monitoring, and enhanced teacher–family communication.

Purposeful practice: Characterized by focused attention, specific feedback, and clear goals, purposeful practice enhances skill development and retention. Hatch supports this by offering interactive activities with real-time feedback, structured learning goals, repeated practice, and immediate rewards.

Joyful rigor: This approach combines high academic standards with engaging, enjoyable learning experiences, particularly in foundational areas like math and literacy. Hatch supports this by integrating rigorous standards with fun activities, promoting active learning, and fostering mastery of essential skills.

Play as learning: Playful learning fosters intellectual, social, and emotional development through various forms of play. Hatch supports this by providing diverse learning experiences with guided and free play, ensuring that children experience choice and delight.

Child-led exploration: This approach emphasizes self-directed exploration and experimentation, enhancing motivation and deeper learning. Hatch supports this by offering self-directed play, choice, and personalization, allowing children to engage deeply with their learning.

Insights and Analytics

Integrating insights and analytics is crucial for enhancing student success and creating inclusive learning environments. Advanced assessment tools and data analytics help educators understand each child's unique learning journey, allowing for targeted support and personalized learning experiences. By continuously analyzing student performance data, teachers can identify strengths, address areas for improvement, and adjust their instructional strategies to meet diverse needs effectively.

Assessment for learning: This approach uses ongoing feedback to engage students, clarify criteria, and guide instruction, improving performance and closing achievement gaps. Hatch supports this with digital play-based activities that assess understanding, offer real-time feedback, and promote independent learning.

Data-driven insights: This method involves systematically collecting and analyzing data to tailor teaching strategies, enhance outcomes, and support individualized learning. Hatch facilitates this by managing the data-driven instruction cycle—collecting data, analyzing it, planning, teaching, and reassessing—while enabling personalized instruction and effective communication with families.

Community-Connected Learning

Another essential component of early education is integrating families and communities into education communities. Community-connected learning extends education beyond the

classroom by involving families and the broader community in children's learning. This approach fosters strong, trust-based relationships between educators, families, and community members, enhancing educational experiences and outcomes. By promoting family engagement and equitable access to quality early education, community-connected learning aims to create a more inclusive and supportive educational environment. Hatch Early Learning's products support these principles by facilitating family involvement and equitable education access.

Family engagement: This involves collaboration between schools, community agencies, and families to support children's development through strong relationships, transparency, and cultural competence, which improves academic outcomes and well-being. Hatch enhances family engagement by providing home-based learning activities, progress tracking, and tools for effective communication between teachers and families.

Equitable access to learning: Equity ensures that every student gets the resources and rigorous education they need, regardless of their circumstances, to promote fairness and eliminate disparities. Hatch supports this by offering standards-aligned content, accommodating diverse learning styles, reflecting various cultures and languages, and providing tools for progress tracking and continuous improvement.

Impact and Future Directions

Hatch's pedagogical principles underpin all of our products, ensuring that they are based on solid educational practices and theories. Research shows that Hatch products significantly enhance children's educational experiences and outcomes. Surveys indicate that more than 80% of educators find that children enjoy using Ignite by Hatch™ and are excited about IgniteTable by Hatch™, with engagement levels rated high during play. Observational studies confirm that Ignite games effectively capture and hold children's attention. Additionally, Hatch products are reported to prepare preschoolers well for kindergarten and help them practice a range of skills. Ignite is certified with promising evidence under the Every Student Succeeds Act, showing that increased engagement with the platform correlates with greater progress in kindergarten readiness and improved literacy and math skills. Overall, these findings demonstrate that Hatch's approach effectively combines engagement with educational development, helping children succeed in their learning journeys.

As the educational landscape evolves, Hatch Early Learning is poised to lead the future of early childhood education by focusing on key areas of innovation. The company is dedicated to advancing personalized learning through adaptive technologies and predictive analytics, ensuring tailored educational experiences that meet the unique needs of each child. By integrating emerging technologies, Hatch aims to enhance the effectiveness and interactivity of its products, supporting both children's development and educators' needs. The company also emphasizes accessibility and equity, striving to create inclusive learning environments that cater to diverse learners. To support educators, Hatch is committed to ongoing professional development, offering platforms for continuous learning and collaboration. Additionally, Hatch plans to strengthen communication between educators and families, fostering deeper engagement and support for children's learning. The company's advocacy

for early childhood education policies aims to influence increased funding and resources for high-quality education. Finally, Hatch's investment in research and development, in partnership with academic institutions, ensures that its products remain at the forefront of educational excellence. By addressing these critical areas, Hatch is prepared to adapt to the changing demands of the education sector, continuing to empower educators and enrich the learning experiences of young children.

Conclusion

This white paper articulates Hatch Early Learning's comprehensive pedagogical philosophy, detailing our innovative approach to early childhood education. By aligning instructional practices with our core principles, we aim to enhance educational outcomes and support diverse student needs while fostering strong relationships with families and promoting equity in access to quality education.

Through our research-based solutions and commitment to whole-child development, Hatch Early Learning is dedicated to transforming early education and empowering educators to create effective, inclusive learning environments. Our approach not only addresses the achievement gap but also prepares children for future academic success, demonstrating our commitment to advancing education for all.

Contents

Introduction

In today's rapidly evolving educational landscape, having a clear and effective pedagogical philosophy is essential for fostering meaningful learning experiences. A well-defined pedagogical philosophy provides a foundational framework that guides instructional practices, curriculum design, and assessment strategies, ensuring that all educational efforts are aligned with the overarching goal of student development and success.

The importance of a pedagogical philosophy extends beyond mere theoretical discussions. It provides guiding principles that ensure that the development and implementation of educational products align with sound educational practices and learning theories. By articulating a coherent philosophy, Hatch Early Learning can create consistent, focused, and supportive learning solutions that address the diverse needs of all students.

This white paper aims to inform educators, administrators, and other stakeholders about Hatch Early Learning's pedagogical philosophy. We will delve into the core principles that underpin our approach, explore the key components that make up our instructional framework, and illustrate how these elements come together to create effective and engaging learning experiences. Through detailed explanations, practical examples, and evidence of impact, we seek to provide a comprehensive understanding of our pedagogical philosophy and its significance in contemporary education.

By the end of this white paper, readers will have a clear understanding of our educational approach and its potential to transform teaching and learning.

Overview of Hatch Early Learning

Playful Learning Meets Actionable Data to Empower Early Childhood Educators

Hatch Early Learning is the trusted leader in early education. Our interactive learning solutions provide administrators and teachers of early childhood education programs with actionable data on student grade-level readiness across multiple domains of learning, including math, literacy, and language, and other areas of child development.

By harnessing the power of our research-based and standards-aligned content, educators gain valuable insights into student progress as they engage with the interactive, fun, and captivating Hatch™ tools individually, in small groups, or as a class. This data empowers administrators and teachers to make informed decisions, differentiate instruction, collaborate more effectively with families or caretakers, and drive targeted interventions for improved student outcomes.

With Hatch Early Learning solutions, administrators can streamline paperwork and recordkeeping and save teachers time. Our intuitive platforms simplify data collection, analysis, and reporting, reducing the number of administrative tasks and allowing educators to focus on classroom instruction and fostering a supportive educational environment.

Hatch Early Learning's Product Suite

Hatch Early Learning offers a comprehensive full-classroom solution designed to save teachers time and provide fun, multimodal learning tools for early learners that focus on seven domains of learning, with an emphasis on literacy. Our solution combines our cutting-edge products—**Insights by Hatch™**, our teacher and administrative dashboard; **Ignite by Hatch™** and **IgniteTable by Hatch™**, which feed data to Insights as students play interactive games; and **IgnitePanel by Hatch™**, our game-changing interactive panel for classrooms—to provide administrators, educators, and early learners with a transformative education experience. **Key Foundations by Hatch™** is our print-based literacy offering aligned with the science of reading.

With **Insights**, administrators and teachers gain clear, actionable student data on academic grade-level readiness and child development as students play interactive games individually or in groups on Ignite and IgniteTable. This data empowers educators to make informed decisions, support personalized instruction, drive improved student outcomes, and effectively communicate and collaborate with families or caretakers.

Ignite, our dynamic learning platform, captivates early learners while delivering critical academic and 21st-century skill data to educators and administrators. Through fun, interactive experiences, Ignite promotes growth across multiple domains for students in pre-K through first grade and empowers teachers to more easily create small-group and individualized instruction offline and in the classroom.

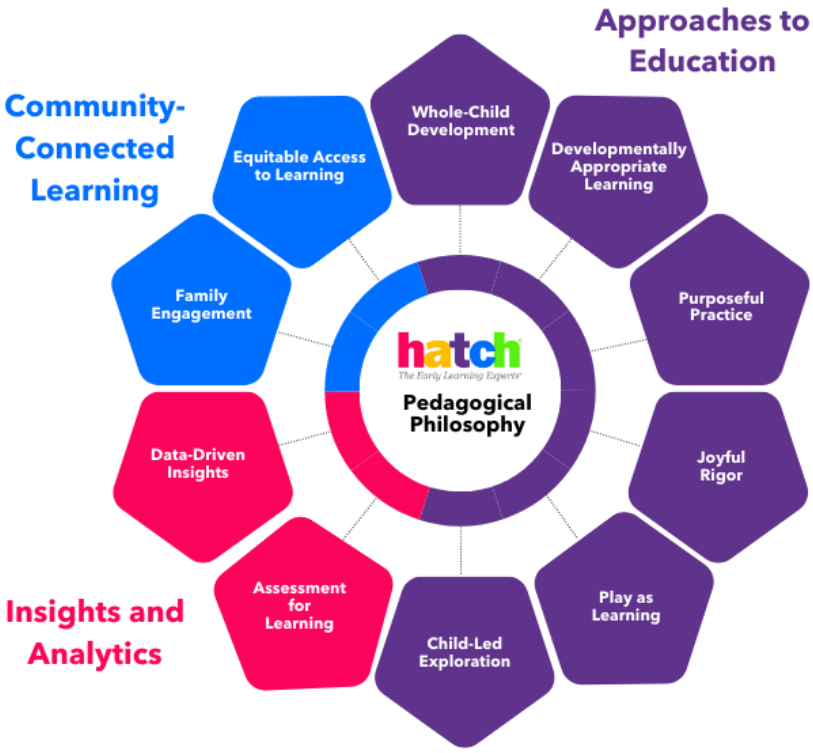
IgniteTable takes collaborative learning to new heights. This interactive table learning solution fosters collaborative learning, communication, and prosocial skills among small groups of children. IgniteTable captures data and evidence automatically, allowing teachers to observe, record, and analyze student interactions and behaviors and enhancing their understanding of each child's progress.

IgnitePanel revolutionizes whole-class instruction with a comprehensive interactive panel. Educators effortlessly access engaging learning activities and strategies rooted in scientific research, catering to learners of all skill levels. IgnitePanel streamlines lesson planning, reduces administrative work, and empowers educators to monitor student growth effectively.

Key Foundations is Hatch's print-based literacy solution aligned with the science of reading that unlocks literacy instruction for children in pre-K through kindergarten and their teachers. Resources include a robust Teacher Guide, 30 Pre-Decodables Books, a Game Book, Cue Cards and Picture Cards, Alphabet Bops, and Consumables. This evidence-based offering further complements the Ignite advantage of purposeful practice of skills across seven domains of learning, yielding actionable data for educators through the Insights dashboard.

Hatch's Pedagogical Philosophy

At Hatch Early Learning, we create thoughtful, innovative early-learning solutions fueled by research so that every student is prepared for success in school. We recognize that fostering the holistic development of young learners is not just an educational philosophy; it is a profound responsibility. Our pedagogical approach draws inspiration from research, empirical evidence, and best practices driving our mission to Ignite learning and close the achievement gap.



Approaches to Education

In the multifaceted world of early childhood education, a comprehensive approach to teaching is essential for fostering holistic child development. Our

methodologies at Hatch Early Learning are designed to support whole-child development, emphasizing the importance of nurturing all aspects of a child's growth—cognitive, social, emotional, and physical. Developmentally appropriate learning ensures that educational experiences are tailored to the individual needs and abilities of each child, promoting meaningful and effective learning.

Purposeful practice is at the heart of our educational philosophy, encouraging children to engage in activities that build essential skills through repetition and refinement. This is complemented by the concept of "joyful rigor," where rigorous academic foundations in math and literacy are achieved through engaging, enjoyable activities that inspire a love of learning. Recognizing play as a critical component of education, we advocate for child-led exploration and active, hands-on learning. These approaches allow children to explore their interests, experiment, and discover in a supportive and stimulating environment, laying a strong foundation for lifelong learning and success.

This section delves into the principles and benefits of these educational approaches, highlighting how Hatch Early Learning's products and methodologies support the development of well-rounded, curious, and capable learners.

Insights and Analytics

In today's educational landscape, the integration of insights and analytics has become indispensable in driving student success and fostering an inclusive learning environment. This section delves into the pivotal role of assessment and data-driven instruction in shaping educational outcomes, highlighting the transformative power of these approaches in early childhood education. By leveraging advanced assessment tools and data analytics, educators can gain a deeper understanding of each child's unique learning journey, enabling targeted support and personalized learning experiences.

At the heart of effective teaching lies the ability to assess and respond to each child's learning needs. Insights and analytics provide educators with the tools to do just that, transforming raw data into actionable intelligence. By continuously collecting and analyzing data on student performance, teachers can identify strengths, pinpoint areas for improvement, and tailor their instructional strategies to meet the diverse needs of their students.

Community-Connected Learning

In an increasingly interconnected world, the importance of integrating families and communities into the educational framework cannot be overstated. Community-connected learning emphasizes the necessity of extending the educational experience beyond the classroom walls, fostering a collaborative and supportive environment that involves families and the broader community in children's learning journeys. This approach underscores the value of creating strong, trust-based relationships between educators, families, and community members, thereby enhancing children's educational experiences and outcomes.

By promoting family engagement and equitable access to high-quality early childhood education, community-connected learning aims to create a more inclusive, supportive, and effective educational environment. This section explores the foundational principles and

benefits of family engagement, the impact of equitable access to education, and how Hatch Early Learning's products support these essential components of community-connected learning.

Approaches to Education

Whole-Child Development

We believe that fostering cognitive, social, and emotional growth is paramount for preparing children for a lifetime of success and well-being.

Whole-Child Development Defined

Whole-child development is an educational approach based on the principle that learning should extend beyond academics to include all aspects of a child's well-being. Whole-child development and the whole-child view of education "focuses . . . on the social, emotional, mental, physical as well as cognitive development of students" (Slade & Griffith, 2013, p. 21).

> "The whole child approach gives children the foundation they need to become well-rounded, healthy individuals, equipped with a solid education and important life skills to help them reach their full potential."
>
> *Bauer & Westmoreland, National PTA, The Center for Family Engagement*

Unlike traditional education models that focus primarily on academic achievement, whole-child development aims to cultivate well-rounded individuals equipped to succeed in various aspects of life. "The whole child approach gives children the foundation they need to become well-rounded, healthy individuals, equipped with a solid education and important life skills to help them reach their full potential" (Bauer & Westmoreland, 2019).

In order to be successful in school and beyond, children undoubtedly need to develop content knowledge and academic skills, but they also need noncognitive factors. Noncognitive factors (sometimes called "soft skills") are "strategies, attitudes, and behaviors" that are crucial components of academic and school success (Farrington et al., 2012, p. 4).

There are five categories of noncognitive factors (Farrington et al., 2012):

- **Academic behaviors** refer to behaviors such as attending class ready to learn, paying attention, actively participating in learning, studying, and doing homework (Farrington et al., 2012).
- **Academic perseverance** refers to skills such as grit, delayed gratification, self-discipline, and self-control (Farrington et al., 2012). These skills are part of executive function skills, including working memory, mental flexibility, and self-control (Center on the Developing Child, 2012).

- **Academic mindset** refers to the attitudes or beliefs that children have about themselves concerning their academic work, which ranges from a positive mindset that increases motivation and persistence to a negative mindset that can inhibit perseverance and challenge academic achievement (Farrington et al., 2012).
- **Learning strategies** are methods and strategies children use to engage in the cognitive work of thinking, remembering, and learning, including goal setting and time management (Farrington et al., 2012). Learning strategies are also closely tied to executive function skills.
- **Social skills** include a wide range of interpersonal skills, including empathy, cooperation, responsibility, and assertion (Farrington et al., 2012). These social skills are often referred to as social–emotional learning, which encompasses five competencies: self-awareness, social awareness, relationship skills, responsible decision-making, and self-management (Collaborative for Academic, Social, and Emotional Learning, n.d.).

The Impact of Whole-Child Development

Whole-child development is essential for several reasons. First, growth in noncognitive areas can significantly support children's growth in cognitive and academic areas. When children are supported in building and developing their social–emotional skills, their academic performance increases (Berger et al., 2011). Furthermore, research suggests that when schools provide interventions and opportunities for children to build noncognitive factors like social–emotional skills, academic performance increases (Durlak et al., 2011) and can even lead to a decreased likelihood of repeating grades and higher rates of both high school and college graduation (Jones et al., 2015). Similarly, self-regulation and self-control, collectively referred to as executive function skills, are connected to school achievement, better health, and the development of skills like critical thinking, leadership, and teamwork (Center on the Developing Child, 2012).

In addition, a whole-child approach prepares children for life beyond the classroom. While academic skills are crucial, children also need social and emotional competencies, critical thinking, and ethical judgment to navigate the complexities of adult life (National Research Council, 2012). Focusing on whole-child development promotes better mental health. By addressing emotional and social needs, early childhood educators can reduce stress, anxiety, and behavioral issues, contributing to overall well-being (Cejudo et al., 2018).

Finally, whole-child development plays a crucial role in promoting equity. It can help bridge gaps by providing all children, regardless of background, with opportunities to develop a wide range of skills (Chafouleas & Iovino, 2021).Ultimately, children are complex beings with interconnected needs across cognitive, social, emotional, and physical domains, and educational tools that address the whole child can better equip young learners with the social skills, emotional resilience, and cognitive abilities needed for success in school and life (LaForett et al., 2023).

Whole-Child Development in Hatch Products

Hatch Early Learning's products are thoughtfully curated to provide rich learning experiences that stimulate cognitive development, encourage emotional intelligence, and support social interactions. Our products align with whole-child development principles by fostering academic skills alongside social–emotional competencies and critical thinking skills through engaging and developmentally appropriate learning activities.

Hatch's solutions support whole-child development by

- encouraging academic rigor and high expectations by providing research-based, developmentally appropriate content that challenges children to reach their full potential.
- supporting the development of social–emotional and executive function skills, like empathy, cooperation, responsibility, and self-control.
- promoting active engagement through interactive digital play and hands-on learning activities.
- providing personalized learning paths and comprehensive resources to ensure strong, tailored support for each child's learning needs.

Hatch products provide children with opportunities for interactive digital play that enhances whole-child development.

Developmentally Appropriate Learning

We believe that high-quality educational tools should be thoughtfully designed to align with the developmental stages through which children progress.

Developmentally Appropriate Learning Defined

Developmentally appropriate learning is often referred to as developmentally appropriate practice (DAP). The National Association for the Education of Young Children (NAEYC) defines DAP as teaching "methods that promote each child's optimal development and learning through a strengths-based, play-based approach to joyful, engaged learning" (n.d.-a, para 1).

NAEYC has identified six guidelines for DAP:

1. creating a caring, equitable community of learners
2. engaging in reciprocal partnerships with families and fostering community connections
3. observing, documenting, and assessing children's development and learning
4. teaching to enhance each child's development and learning
5. planning and implementing an engaging curriculum to achieve meaningful goals
6. demonstrating professionalism as an early childhood educator (NAEYC, n.d.-c)

DAP Focuses on Relationships

DAP is not a set curriculum or scope and sequence of learning; instead, it's a pedagogical approach to learning that emphasizes the importance of creating safe, supportive environments with responsive caregiving. One of the key reasons DAP is essential is because it promotes a positive school climate, which is characterized by physical and emotional safety, positive relationships, and a stimulating environment. This climate helps children thrive and become engaged learners (National Center on Safe Supportive Learning Environments, n.d.).

Beyond a positive school environment, DAP emphasizes the importance of meeting each child where they are developmentally, academically, and culturally. DAP is grounded in research on child development and learning, emphasizing educational practices that are both age appropriate and individually appropriate for each child (NAEYC, n.d.-c). Furthermore, DAP encourages active engagement through play, exploration, and inquiry, which supports holistic development, including social, emotional, cognitive, and physical growth (NAEYC, n.d.-c).

Additionally, a safe and supportive learning environment created through DAP not only enhances academic achievement but also addresses children's basic needs for belonging, autonomy, influence, and competence. This comprehensive approach ensures that each child's unique potential is recognized and nurtured (National Center on Safe Supportive Learning Environments, n.d.).

Impact of DAP

Research tells us that "young children experience their world as an environment of relationships, and these relationships affect virtually all aspects of their development" (National Scientific Council on the Developing Child, 2009, p. 1). Strong, positive relationships in early childcare settings can impact a child's learning later on, potentially leading to diminished behavioral problems, increased social competence, and boosted thinking and reasoning skills (National Scientific Council on the Developing Child, 2009). Additionally, studies have shown that children who experience warm relationships with their kindergarten teachers are "more excited about learning, more positive about coming to school, more self-confident, and achieve more in the classroom" (National Scientific Council on the Developing Child, 2009, p. 2).

DAP in Hatch Products

Hatch Early Learning's products include developmentally appropriate content, activities, and materials that respect the individual needs and capabilities of each child. Our products provide personalized, play-based, and engaging educational experiences.

Hatch's solutions help educators provide developmentally appropriate environments and instruction by

Hatch products help create inclusive and supportive classroom environments.

- offering personalized learning paths that cater to each child's strengths, abilities, and challenges and allow for differentiated instruction based on individual progress.
- providing learning activities in both English and Spanish, ensuring that the tools meet children where they are.
- continuously monitoring and documenting children's progress through real-time data and reports in Insights.
- facilitating communication between teachers and families by providing progress updates on Insights, which helps to build strong partnerships focused on the child's development.
- offering engaging and scaffolded learning activities to engage children in active learning, supporting cognitive, social, and emotional development.
- providing interactive group activities that enhance learning through collaboration and play, fostering both academic and social skills.
- providing both embedded and formal professional development and teacher guides that allow educators to easily tailor instruction that meets each child's developmental stage, promoting equity in learning opportunities.

Purposeful Practice

We believe that purposeful practice is essential for mastery.

Purposeful Practice Defined

Purposeful practice refers to a focused and deliberate approach to learning that leads to skill improvement. According to Anders Ericsson and Robert Pool, authors of *Peak: Secrets from the New Science of Expertise*, purposeful practice has three core components: (1) The learner is focused, (2) the learner received feedback, and (3) the activity includes clearly defined goals (2016).

> "Deliberate, structured, and sustained practice is the 'magic' that provides opportunity for success in almost any field."
>
> Vaughn & Fletcher, 2023, p. 15

Focused attention: During purposeful practice, individuals concentrate intensely on the task at hand, minimizing distractions. This focused attention allows for deeper engagement and better learning outcomes (Ericsson, 2006). Focused attention is not merely about eliminating external distractions; it's also about maintaining mental clarity and a

singular dedication to the task, which helps to solidify learning and enhance cognitive processing.

Feedback: Receiving timely and specific feedback is crucial for purposeful practice. Feedback helps learners understand their mistakes and make necessary adjustments, facilitating continuous improvement (Hattie & Timperley, 2007). Effective feedback should be actionable, allowing learners to apply corrections immediately and understand the rationale behind the adjustments. This iterative process of receiving and implementing feedback is key to refining skills and achieving higher levels of performance.

Clearly defined goals: Purposeful practice involves having clear, specific goals. Clear goals help direct attention and effort towards specific areas of improvement (Ericsson et al., 1993). These goals should be challenging yet attainable, providing a road map for progression and a sense of achievement upon completion. Well-defined goals also allow for the measurement of progress, giving learners a tangible sense of their development and motivating them to continue practicing.

The Importance of Purposeful Practice

Purposeful practice is essential for skill development and mastery (Brabeck et al., 2015). Purposeful practice ensures that learning is not haphazard but structured in a way that maximizes the benefits of each session, laying a solid foundation for skill development.

Simply put, practice increases the chances that children retain and remember new information (Anderson, 2008). Repetition reinforces memory pathways, making it easier for children to recall and apply what they have learned. The more children practice, the stronger these memory pathways become, leading to better retention and recall.

Practice increases automaticity, or fluency, which frees up children's cognitive resources so that they can take on more challenging tasks (Brown & Bennett, 2002; Moors & De Houwer, 2006). When basic skills become automatic, children can focus their cognitive efforts on higher-level thinking and problem-solving. This automaticity is crucial for complex tasks that require multitasking or advanced reasoning.

For any new skill or competency learned, practice can support children in transferring their practiced skills to different situations or areas of learning or to more complex situations (Brabeck et al., 2015; Glover et al., 1990). The ability to transfer skills across contexts is a hallmark of true learning and understanding. This transferability means that children can adapt their knowledge to new challenges, enhancing their overall learning experience.

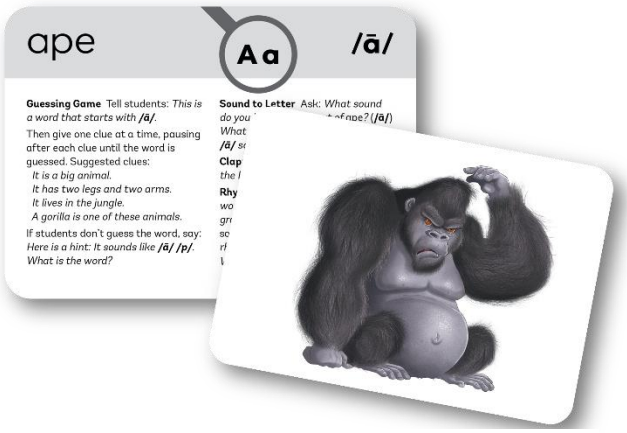
When children experience success as a result of practice, their motivation to learn increases (Kalchman et al., 2001). Success reinforces the value of effort and practice, encouraging children to continue their learning journey. This positive feedback loop not only builds confidence but also fosters a lifelong love of learning.

Purposeful Practice in Hatch Products

Hatch Early Learning's products are designed to engage children in the meaningful and purposeful practice of important skills within early childhood education. Our products provide numerous opportunities for meaningful learning by engaging children in various learning activities.

Hatch's solutions help support purposeful practice by

- engaging children in practicing focused attention through interactive activities that require children to concentrate intensely on tasks.
- providing real-time feedback to children, allowing them to understand their mistakes and make necessary adjustments immediately.
- providing detailed data and insights to teachers, enabling them to give specific and constructive feedback to students.
- beginning with well-defined learning goals and objectives within structured and purposeful learning activities.
- offering repeated, structured opportunities for practice, which reinforces memory pathways, aids in the retention of new information, and builds automaticity and fluency.
- developing motivation and confidence by providing immediate rewards and positive reinforcement, increasing children's motivation to practice and learn.



Hatch products start with structured, purposeful learning goals and engaging activities.

Joyful Rigor

We believe that rigor and enjoyment can and should coexist in the learning process.

Joyful Rigor Defined

Joyful rigor in education refers to a teaching approach that combines high academic standards with engaging and enjoyable learning experiences. This method emphasizes the importance of challenging students while also making the learning process enjoyable and motivating (Golinkoff & Hirsh-Pasek, 2016; Wagner 2008). The concept rests on the belief that rigorous academic expectations do not have to come at the expense of student happiness and engagement; instead, they can complement each other to foster a more effective and enriching educational environment.

Rigor, while often thought of as being demanding or difficult, is simply "the result of work that challenges students' thinking in new and interesting ways" (Sztabnik, 2015, para. 9).

Key Elements of Joyful Rigor

Hirsh-Pasek and Hadani (2020) identify six characteristics of learning environments that have both joy and rigor, which include opportunities for learning that is active, engaging, meaningful, socially interactive, joyful, and iterative.

Active ("minds-on") learning. Learners need active involvement in their learning versus passive reception of information (Chi, 2009; Hirsh-Pasek & Hadani, 2020). This cognitive activation increases children's engagement, maintains their attention and helps them develop a positive attitude towards learning (Hirsh-Pasek et al., 2009).

Engagement. Engaged learning fundamentally revolves around sustaining attention. When engaged learning occurs, children are deeply focused on the task at hand, actively concentrating on their activities. It involves creating experiences that keep children engaged and on task, which addresses one of the primary challenges in learning environments: helping children filter out distractions and maintain their attention on their learning activities. Designing lessons and activities that are interesting, relevant, and stimulating for students is critical to achieve engagement. Additionally, engagement has long been linked to future academic achievement as well as increased learning in early grades (Hirsh-Pasek et al., 2015; Ladd & Dinella, 2009; Ponitz et al., 2009; Portilla et al., 2014; Robinson & Mueller, 2014; Williford et al., 2013).

Meaningful learning. Learning is most meaningful when children can connect what they are learning to their own knowledge and experiences with real-world application and activation of prior knowledge (Hirsh-Pasek & Hadani, 2020). As children encounter new information, they integrate it with their existing knowledge or schemata, enhancing their understanding and expanding their intellectual horizons (Piaget, 1968). Neuroscience research supports this strategy, indicating that linking new information to well-established knowledge enhances learning effectiveness (Shen et al., 2017).

Socially interactive learning. Humans are wired for connection, and structures for learning are no exception. Children are successful when given the opportunity to cooperate and work together, with adult support when necessary (Ghafouri & Wien, 2005; Ramani, 2012; Vygotsky, 1978). Similarly, relatedness, or feeling connected to others, is a key part of setting children up for intrinsic motivation and can be achieved through partner or group projects (Harvard Graduate School of Education, 2016).

Iterative learning. When children are active participants in their learning and interact with their environment, they can engage in valuable learning (Hirsh-Pasek & Hadani, 2020; Weisberg et al., 2015). Iterative learning is a process where knowledge or skills are refined through repeated cycles of practice and feedback. In this approach, learners repeatedly engage with material or tasks, with each cycle aimed at improving understanding and performance based on the insights and feedback gained from previous cycles. Iterative learning experiences provide children with opportunities to learn through exploration (Weisberg et al., 2015).

Joyful learning. Research indicates that when children experience joy while learning, they can experience increased creativity and flexible and integrative thinking (Hirsh-Pasek &

Hadani, 2020; Isen, 2001). When children are encouraged to find personal meaning and satisfaction in their academic achievements, they can experience intrinsic motivation, or a drive to explore their curiosity and learn. Intrinsic motivation can be achieved through autonomy in learning, which increases motivation and persistence and encourages deep learning (Beachboard, 2020; Harvard Graduate School of Education, 2016).

Joyful Rigor: Foundational Focus on Mathematics and Literacy

While all domains of learning are critical and interconnected, mathematics and literacy instruction are important foundational focuses in early learning due to their critical roles in overall academic and life success.

Math Learning

In early childhood and the primary grades, children must acquire mathematical skills and knowledge while honing their aptitude for thinking and problem-solving in mathematical contexts (National Research Council, 2001). Research has shown that early math skills are a strong predictor of later academic achievement (Allensworth & Easton, 2007). Mastery of foundational mathematics skills, such as numeracy, is related to positive long-term outcomes, including grade retention, college attendance, and later math achievement (Claessens & Engel, 2013; Davis-Kean et al., 2021). Early math achievement has also been linked to reading achievement and improved executive functioning (Allensworth & Easton, 2007).

Activities such as counting, sorting, and recognizing shapes and patterns help children develop their critical thinking and problem-solving abilities. These skills are essential not only for math but also for other areas of learning and daily life. Moreover, these early math activities support the development of executive functions, such as working memory, cognitive flexibility, and inhibitory control, which are crucial for problem-solving and critical thinking in various contexts (Chen, 2024). These foundational skills are transferable and benefit children beyond math, aiding in tasks that require logical reasoning, organization, and the ability to follow multistep procedures.

A strong foundation in early math is crucial for later success in science, technology, engineering, and mathematics (STEM) fields. Early exposure to math concepts prepares children for the complex thinking required in these disciplines. Early math competency can lead to better understanding and performance in STEM subjects later on (Stipek & Johnson, 2020).

Literacy Learning

The intensified emphasis on children's literacy development, contextualized within the challenges of the 21st-century landscape, has influenced both national (Common Core State Standards for English Language Arts & Literacy) and state-level standards and has become a cornerstone of high-quality educational programs and products. Research shows that early conventional reading and writing skills—including alphabet and letter–sound knowledge, phonological awareness, print knowledge, concepts about print, reading readiness, oral language, and writing—are predictive of later literacy success (National Early Literacy Panel, 2008).

Early literacy instruction not only prepares children for immediate academic challenges but also has long-term benefits. Effective early literacy education increases the likelihood of children becoming proficient readers and writers, which correlate with higher academic achievement and graduation rates (Camilli et al., 2010). Moreover, literacy skills acquired in preschool predict reading comprehension proficiency by fourth grade—a critical predictor of a child's future educational trajectory and income level (Dickinson & Porche, 2011; Pace et al., 2019).

Additionally, early literacy instruction supports the rapid development of reading and vocabulary skills and reduces the Matthew effect, where children with early advantages in literacy progress faster than those who are less advantaged (Stanovich et al., 1986). It also helps in identifying and addressing literacy difficulties early on, promotes social–emotional competencies, and enhances classroom behavior and engagement (Blair & Peters Razza, 2007; Foorman et al., 2018).

Long-Term Impacts of Math and Literacy Learning

Focusing on math and literacy in early education is crucial because these subjects underpin many aspects of academic and personal development. Effective math and literacy instruction provide children with the necessary skills to succeed in school and life, supporting both immediate educational outcomes and long-term economic and social benefits.

Children who develop strong math and literacy skills in early childhood are better prepared for school. These foundational skills help them engage with the curriculum, follow instructions, and perform well academically. School readiness is a key factor in long-term educational success, and early proficiency in math and literacy sets the stage for ongoing academic achievement (Duncan et al., 2007; Li-Grining et al., 2010; McCoach et al., 2006).

Early math and literacy competence can also have long-term educational and economic benefits. The National Research Council states that "academic success, as defined by high school graduation, can be predicted with reasonable accuracy by knowing someone's reading skill at the end of grade 3. A person who is not at least a modestly skilled reader by that time is quite unlikely to graduate from high school" (1998, p. 21). Similarly, studies have shown that as many as 81% of students who failed a sixth-grade math course failed to graduate high school (Balfanz et al., 2007). High school graduation can have a significant impact on income and economic opportunities (Planty et al., 2009). Studies have shown that individuals with strong early learning foundations have higher rates of employment and increased wages (McIntosh & Vignoles, 2001; Vignoles et al., 2011).

The skills acquired through early math and literacy education are not just academic; they also contribute to lifelong learning and adaptability. Strong early learning foundations help individuals adapt to new information, think critically, and solve problems throughout their lives, enabling them to navigate an ever-changing world effectively.

Joyful Rigor in Hatch Products

Hatch Early Learning's products provide age-appropriate challenges that inspire children to think critically, solve problems, and persist in the face of difficulties. Our products are built on the idea that the joy of learning emerges when children achieve a sense of accomplishment through their efforts. Additionally, our products center literacy and mathematics as foundational domains for learning.

Hatch learning experiences work towards academic rigor while making learning fun.

Hatch's solutions help support joyful rigor by

- ensuring that all learning activities are based on academically rigorous standards while making sure that they are fun and engaging for children.
- engaging active learning principles in each learning experience, where children are expected to think and construct their understanding rather than receive passive information.
- providing opportunities for children to collaborate and work together to support engaged learning.
- providing learning experiences that build upon children's prior knowledge to support meaningful learning.
- helping children gain a mastery of foundational mathematical skills, like numeracy, patterns, sorting, and problem-solving.
- helping children gain a mastery of foundational literacy skills, such as alphabet and letter–sound knowledge, phonological awareness, print knowledge, concepts of print, oral language, and writing.

Play as Learning

We believe play is a powerful form of learning and a natural avenue for children to explore their world, develop problem-solving skills, and express themselves.

Playful Learning Defined

Playful learning can be defined as any activity where "children learn content while playing freely . . . with teacher guidance . . . or in a structured game" (Zosh et al., 2022, para. 6). Playful learning exists on a spectrum influenced by three key variables: the level of adult involvement, the degree of self-direction in the child's learning, and the presence of a learning goal (Zosh et al., 2018, 2022). Towards one end of this spectrum, activities are characterized by higher child agency, minimal adult involvement, and loosely defined or nonexistent learning goals. On the other end, activities feature greater adult involvement while still allowing the child to direct the activity (Zosh et al., 2018, 2022).

There are three primary types of playful learning: free play, guided play, and game play (Zosh et al., 2018, 2022).

Free play is exactly as it sounds—free from planning or adult direction. In this form of play, the child initiates and directs the activity with no explicit learning goal (Zosh et al., 2018, 2022). Examples of free play in early childhood education include pretend play, outdoor imaginative play, and free time within a daily classroom schedule.

Guided play involves a teacher or an adult focusing a child's play on specific learning goals. In this scenario, the adult initiates the play but the child directs it, maintaining an explicit learning objective (Zosh et al., 2018, 2022). Importantly, during successful guided play, the adult does not take over the activity. Instead, they ask questions that guide the next level of child-directed exploration. There is no single definition or implementation strategy for guided play; teachers should tailor the experience to meet the individual needs and strengths of the children they are teaching.

Game play involves an adult curating a learning experience by structuring the activity around a specific learning goal. As with guided play, the adult initiates the activity, the child directs it, and an explicit learning goal is present (Zosh et al., 2018, 2022). Despite the structured nature of game play, children should still be allowed to direct their own learning experience.

Indicators of Playful Learning

While our understanding of playful learning is still evolving, three overlapping indicators have been identified: choice, delight, and wonder (Zosh et al., 2022). These indicators represent the psychological states and observable behaviors of children during play. When all three indicators are present, a child is most likely engaged in playful learning.

Choice feels like empowerment, autonomy, ownership, or intrinsic motivation. It can manifest as children are making and changing rules, sharing ideas, choosing collaborators and roles, setting goals, negotiating, deciding how long to play, being spontaneous, or moving around (Zosh et al., 2022).

Delight feels like enjoyment, excitement, satisfaction, inspiration, or belonging. Observable behaviors include children smiling and laughing, joking or being silly, singing, succeeding, celebrating, being altruistic, competing, or focusing their attention (Zosh et al., 2022).

Wonder feels like curiosity, novelty, surprise, engagement, fascination, or challenge. It looks like children improvising, learning from mistakes, imagining, taking risks, trying new things, pretending, inventing, expressing excitement, creating, or exploring (Zosh et al., 2022).

Benefits of Learning Through Play

Play supports intellectual development, and when children play, they are building skills related to multiple domains of development (science, math, literacy, etc.). They are also building content knowledge and creative thinking skills (Mardell et al., 2016). During play, children can engage in social development and start making sense of relationships. They practice skills like reading cues, listening, and taking another's perspective. They build friendships; learn to share ideas, express themselves, and compromise; and start to practice collaboration (Mardell et al., 2016).

Playful learning experiences enable children to construct knowledge and develop problem-solving skills, supporting the cognitive, emotional, and social development of young children (Smith, 2005). Play also supports the development of executive function. Children learn and practice skills for self-regulation during play, like delaying gratification, controlling impulses, and managing their attention. Self-regulation is related to peer acceptance and positive self-worth (Mardell et al., 2016). Additionally, play provides opportunities for children to develop muscle control, coordination, reflexes, strength, and an understanding of their body's abilities and limits (Mardell et al., 2016).

What makes playful learning unique is how it builds on children's curiosity, exploration, problem-solving, and experimentation. This approach allows teachers to enhance learning as children play by leveraging their natural inclinations and interests (Zosh et al., 2022). The indicators of playful learning—choice, delight, and wonder—serve as markers for ensuring that children are engaging in meaningful and effective play-based learning experiences.

Play as Learning in Hatch Products

Hatch Early Learning's products infuse play into learning experiences, making education a joyful and engaging experience. Our products are thoughtfully designed to center play and ensure that children's participation in learning activities involves play-like behaviors.

Hatch's solutions support play as learning by

- providing a variety of learning experiences that range in the level of adult involvement and self-direction.
- providing guided play and gameplay with specific learning goals, with additional opportunities for free play activities.
- supporting teachers in engaging in guided play with teacher lesson plans and offline support.
- including learning activities that provide children with ample opportunities for **choice** (children select the activity they play or the specific reward they receive after completing learning activities), **delight** (through vivid illustrative feedback and customizable features), and **wonder** (through novel experiences, warm characters, and a creative design).

Hatch products are playful and give children opportunities for choice, delight, and wonder.

Child-Led Exploration

We believe in fostering child-led learning by creating environments that encourage exploration and child-directed learning.

Child-Led Learning Defined

Child-led learning is grounded in the theory of constructivism, as proposed by psychologist Jean Piaget (1970). Piaget viewed learning as a dynamic process in which learners actively construct their own knowledge. This approach emphasizes hands-on learning activities where children have autonomy and agency over their learning experiences (Fisher et al., 2010; NAEYC, 2009; Schweinhart & Weikart, 1988). Children are natural explorers, and they gravitate towards experiences that allow them to explore, play, and experiment with the world around them. By building on this natural curiosity, child-initiated learning helps children maintain their intrinsic motivation and promotes deeper learning (Alfieri et al., 2011; Deci & Ryan, 2000; McDaniel & Schlager, 1990; Stipek et al., 1995).

Benefits of Child-Led Learning

Child-led learning has been shown to offer numerous benefits, including increased motivation, reduced school anxiety, and higher self-esteem (Hirsh-Pasek, 1991; Stipek et al., 1995). It has also been associated with improved academic motivation and interest (Kikas et al., 2018; Lerkkanen et al., 2012). Research indicates that children who attend child-centered preschools, as opposed to more teacher-directed programs, tend to exhibit better classroom behavior in late elementary school (Marcon, 2002) and higher rates of high school graduation (Graue et al., 2004).

Additionally, studies have shown that child-initiated learning practices are linked to achievements in literacy, math, science, and problem-solving skills (Huffman & Speer, 2000; Kikas et al., 2018; Lerkkanen et al., 2016; Marcon, 1993; Pakarinen & Kikas, 2019). These findings underscore the importance of giving children the freedom to direct their own learning as a means of fostering comprehensive cognitive and social development.

The Role of Child-Led Learning in Instructional Practices

While child-led learning offers multiple positive impacts for early learners, it is important to note that it should be part of a balanced instructional plan and curriculum. Teacher-directed learning is also a necessary and beneficial instructional practice that should be included in classroom instructional plans.

Children enter school with a wide variety of skills, experiences, abilities, and prior knowledge, and instructional practices should not operate in a one-size-fits-all manner. Administrators and educators should strive to find a balance in instructional practices that provide all children with ample opportunities to learn in ways that meet them where they are. This balanced approach ensures that each child's unique needs are addressed, fostering an inclusive and effective learning environment.

Child-Led Exploration in Hatch Products

Hatch Early Learning's products provide opportunities for autonomy and personalization that help children to follow their interests and passions. Our solutions center child-led learning experiences that support students in driving their own learning.

Hatch's solutions support child-led exploration by

- providing opportunities for children to explore and play, make choices, make mistakes, and construct their own knowledge.
- promoting engagement and deeper learning through child-directed learning activities that allow children to actively engage in learning.
- helping children experience autonomy and agency by giving them choices and personalizing learning activities.

Hatch products engage children in hands-on learning, where they can experience autonomy and choice.

Insights and Analytics

Assessment for Learning

We believe that assessment serves as a compass for educators to guide each child's progress.

Assessment for Learning Defined

Assessment for learning (AFL), often referred to as formative assessment, is an approach to teaching and learning that creates feedback, which is then used to improve students' performance. Students become more involved in the learning process and, from this, gain confidence in what they are expected to learn and to what standard.

In an AFL experience, five processes take place (Cambridge International Education Teaching and Learning Team, n.d.):

1. The student and teacher engage in questioning to find out the level of the student's current understanding.
2. The teacher provides feedback about how to improve their learning.
3. The student has a clear understanding of what success looks like for the task they are working on.
4. The student works towards independent learning and engages in peer and self-assessments.
5. The student participates in summative assessments to support improvement.

A central element of AFL is an ongoing interaction between teachers and their students, which can take place via dialogue and feedback loops (Broadfoot et al., 2002). Teachers then use that information to direct continued learning for the child (Broadfoot et al., 2002).

Impact of AFL

AFL is a powerful educational approach that enables the early identification of at-risk students, allowing teachers to proactively monitor student progress and tailor their instructional strategies accordingly (Eberly Center for Teaching Excellence and Educational Innovation, n.d.). By integrating continuous assessment into their teaching practice, educators can provide timely, targeted feedback that has a significant positive impact on student achievement. This feedback not only enhances student performance in summative assessments but also is particularly beneficial for low-achieving students, helping them to close the achievement gap (Cambridge International Education Teaching and Learning Team, n.d.).

AFL fosters a supportive learning environment in which students gain confidence and independence and are encouraged to take an active role in their education. This approach can lead to a transformative shift in classroom culture, promoting a growth mindset where mistakes are seen as learning opportunities rather than failures (Cambridge International Education Teaching and Learning Team, n.d.). Research by Black and Wiliam (2010) suggests that the effective use of formative assessments by teachers can double the learning rate of students. This accelerated learning occurs because formative assessments provide continuous insights into student understanding, enabling educators to adjust their teaching methods to better meet the diverse needs of their students.

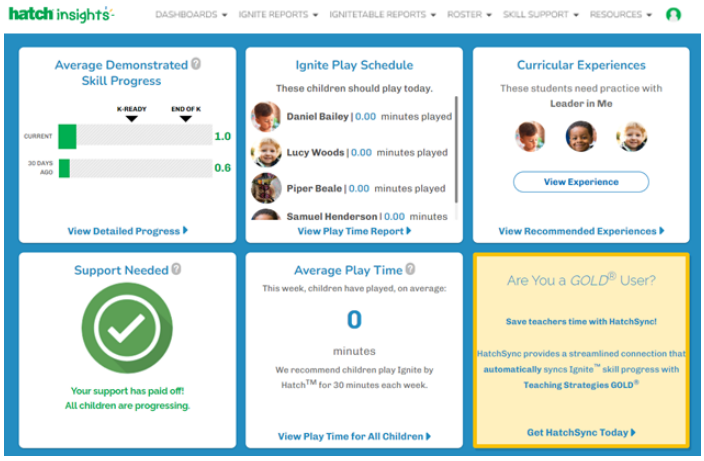
Moreover, the iterative nature of AFL ensures that teaching is not static, but responsive, evolving in real time based on student performance data. This adaptability is crucial in fostering an inclusive learning environment where all students, regardless of their starting point, can thrive. The combination of early identification, continuous feedback, and adaptive instruction makes AFL an indispensable tool in modern education, driving improved learner outcomes and preparing students for long-term academic success.

AFL in Hatch Products

Hatch Early Learning's products offer assessment features that help educators identify strengths and areas for improvement, enabling targeted support and personalized learning plans tailored to the unique abilities and needs of all students.

Hatch's solutions support AFL by

- utilizing digital play-based learning to assess a child's current level of understanding and provide clear learning goals.
- providing real-time feedback to students on how to improve their learning.
- engaging children in independent learning through captivating activities that promote autonomy and self-directed learning.
- assessing student learning with formative assessments to identify areas for improvement.



Insights dashboards and reports collect formative assessment data that teachers can use to inform their instruction.

Data-Driven Insights

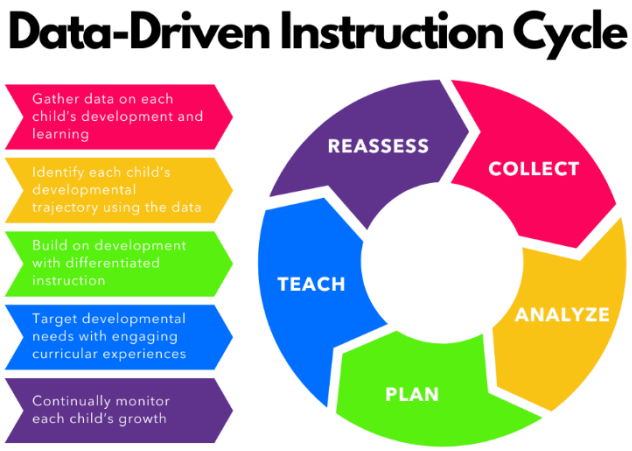
We believe in the transformative power of data to improve education.

The Data-Driven Instruction Cycle

Data-based decision-making (DBDM) refers to using data to work toward specific targeted learning goals (Wayman et al., 2013). This process can take place at the student, classroom, or school level (Schildkamp et al., 2020). DBDM can take many forms and include both quantitative and qualitative data (Wayman et al., 2012).

Within DBDM lies a model often referred to as the data-driven instruction cycle. Data-driven instruction is a crucial approach in early childhood education that involves using relevant collected data to inform and guide teaching practices (Hamilton et al., 2009). The data-driven instruction cycle is a systematic approach that enables educators to tailor their teaching strategies and support to meet the unique needs of each student.

While there are several different models of the data-driven instruction cycle, they all include three main components: collecting information or data, analyzing data, and using that data to inform actions. Here is an example of one version of the data-driven instruction cycle that includes five steps:



Step 1: Collect data: Teachers gather information about children's development and learning through observations and formative assessments. This data helps to identify students' strengths, areas for growth, and learning preferences.

Step 2: Analyze data: Educators analyze the collected data to understand where each child is

on their developmental path. This step involves identifying gaps, misconceptions, and specific learning needs.

Step 3: Plan: Based on data analysis, teachers create individualized plans that address each child's unique needs. Differentiated instruction adapts content, process, and product to match students' readiness, interests, and learning profiles.

Step 4: Teach: Teachers design engaging lessons that align with students' developmental levels. These experiences may involve hands-on activities, group work, technology, or creative projects.

Step 5: Reassess: Teachers regularly check student progress to monitor growth, adjust instruction, and celebrate achievements.

The data-driven instruction cycle is a dynamic and iterative process that empowers educators to respond flexibly to students' evolving needs. By continuously collecting, analyzing, planning, teaching, and reassessing, teachers can create a responsive and adaptive learning environment. This cycle not only enhances educational outcomes but also supports the development of well-rounded, confident, and motivated learners. Embracing this approach ensures that each student receives the personalized attention and support necessary to thrive academically and personally.

The Impact of Data-Driven Instruction

By leveraging data, teachers can make informed decisions that enhance learning outcomes and foster student growth. This approach not only improves academic performance but also supports the holistic development of students by addressing their individual learning styles and preferences. By systematically gathering and analyzing data about students' progress and learning experiences, educators can make more informed decisions about their instructional strategies and tailor their teaching methods to meet the individual needs of each child (Brunner et al., 2005; Forman, 2007; Halverson et al., 2007; Supovitz & Klein, 2003; Wayman & Stringfield, 2006).

When teachers utilize the data-driven instruction cycle, they gain the information and understanding required to engage in the following instructional practices:

Individualized learning: Every child has unique strengths, areas for improvement, and learning styles. Data-driven instruction helps identify these individual differences and adjust teaching methods accordingly. By understanding each child's progress and challenges, teachers can create personalized learning plans that cater to students' specific needs, ensuring optimal learning outcomes.

Targeted interventions: Data-driven instruction allows educators to pinpoint specific areas where a child might be struggling. By analyzing data, they can identify patterns of difficulties and provide timely interventions to address these challenges before they escalate (Fuchs & Fuchs, 2006). This proactive approach helps prevent learning gaps and supports early intervention.

Evidence-based decision-making: Instead of relying solely on assumptions or general teaching strategies, data-driven instruction empowers teachers to base their decisions on concrete evidence. This approach ensures that instructional choices are well-informed and grounded in the actual progress of students.

Continuous improvement: Collecting and analyzing data over time enables educators to monitor the effectiveness of their teaching methods (Fullan, 2011). If they notice that a particular approach is consistently yielding positive results, they can continue and refine it. Conversely, if a strategy isn't producing the desired outcomes, they can adjust or modify it to better suit the needs of their students.

Family and stakeholder communication: Sharing data-backed insights with families and other stakeholders helps foster a collaborative approach to education. Clear communication about a child's progress, strengths, and areas for improvement enhances their overall support network and ensures that everyone is working together to support the child's development, which can increase a child's achievement (Kraft & Rogers, 2014).

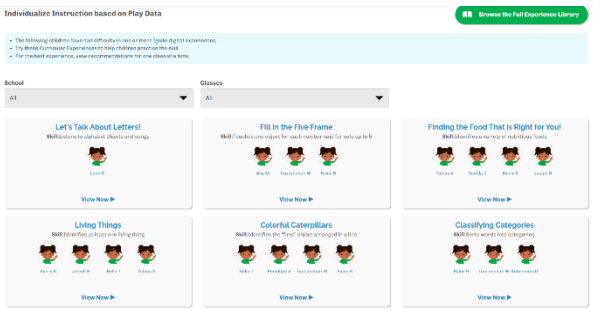
Accountability and documentation: Data-driven instruction provides a record of teaching efforts and the progress of each child. This documentation is valuable for assessment purposes, program evaluations, and demonstrating the effectiveness of teaching methods to administrators, families, and policymakers (Reeves, 2004).

Data-Driven Insights in Hatch Products

Hatch's products provide educators with real-time, actionable insights into student performance, helping them make informed decisions and optimize teaching strategies to create a more equitable and inclusive learning environment.

Hatch's solutions support data-driven insights by

- facilitating educator engagement in the steps of the data-driven instruction cycle, including the following: collect data through children's play, analyze the data through Insights reports, plan instruction through digital and/or offline learning activities, teach, and reassess by collecting more data through children's play.
- helping educators utilize data and reports to individualize and differentiate instruction, engage in continuous improvement efforts, make evidence-based decisions, communicate with families and stakeholders, and document their teaching strategies and student progress.



Data from learning experiences helps teachers group students to differentiate instruction.

Community-Connected Learning

Family Engagement

We believe that involving families in a child's educational journey enhances the learning experience and yields profound, long-lasting benefits.

Family Engagement Defined

At the heart of community-connected learning lies family engagement—a shared responsibility between schools, community agencies, and families to actively support children's learning and development.

The National Association for Family, School, and Community Engagement (NAFSCE) defines family engagement as "a shared responsibility in which schools and other community agencies and organizations are committed to reaching out to engage families in meaningful ways and in which families are committed to actively supporting their children's learning and development" (n.d., para. 1). In other words, family engagement is a two-way street, where both educational institutions and families work together to support children's educational journeys.

At the core of effective family engagement lies the establishment of robust relationships. Schools and educators must recognize that trust and mutual respect are foundational (NAFSCE, n.d.). These relationships between families, teachers, and school communities extend beyond formal meetings and administrative interactions. Instead, they foster an ongoing dialogue—a genuine exchange that transcends report cards and conferences. Families need to feel seen, heard, and valued within this relational framework.

Transparency is also a guiding principle of family engagement. Schools should provide families with insights into their child's learning journey, including data on academic progress, areas of strength, and challenges (NAFSCE, n.d.). Regular communication channels—whether through newsletters, digital platforms, or face-to-face interactions—can be used to facilitate this exchange, making families informed partners and helping them actively participate in their child's education.

Positive family engagement strategies also include educators and administrators taking on the role of attentive listeners. Rather than positioning themselves as sole experts, they engage in reciprocal learning where families share narratives—their child's interests, struggles, and unique qualities (NAFSCE, n.d.). Educators can glean valuable insights and adapt their teaching practices accordingly. This collaborative approach ensures alignment between home and school, benefiting the child's holistic development.

Within a family engagement framework, educators demonstrate evidence-based teaching methods, inviting families to observe (NAFSCE, n.d.). When setting up an environment for learning and integrating learning practices, teachers often ask themselves questions like "How do we nurture curiosity? What strategies celebrate effort and resilience? How can mistakes be reframed as opportunities for growth?" When a school or classroom establishes

strong school–family partnerships, families can witness educators' practices firsthand, internalizing them as they engage with their child's learning process.

Finally, in an increasingly diverse educational landscape, cultural competence becomes paramount. Schools need to recognize that each family brings a rich tapestry of traditions, languages, and values (NAFSCE, n.d.). Educators can incorporate cultural nuances into classroom activities, ensuring that every child feels affirmed and understood.

Benefits of Family Engagement in Early Education

Foremost among the benefits of family engagement is its positive influence on academic outcomes. Research consistently underscores this correlation. When families actively engage with schools and participate in their child's educational journey, several positive effects emerge. These include heightened academic achievement, a reduction in disciplinary incidents, and an overall improvement in the school environment (Henderson & Mapp, 2002; Jeynes, 2012). Notably, meta-analyses by Erdem and Kaya (2020) align with earlier findings by Kim and Hill (2015) and Ma et al. (2015), emphasizing the robust connection between family involvement and children's success in early childhood. Other studies indicate that family involvement can specifically positively impact reading acquisition (Sénéchal & Young, 2008) and math achievement (Galindo & Sheldon, 2012; Van Voorhis et al., 2013).

Family engagement also plays a crucial role in children's social–emotional well-being, motivation, and self-esteem (Jeynes, 2012). Studies indicate that social–emotional learning programs implemented in schools are more effective when they include a family engagement component (Albright & Weissberg, 2010). Higher family involvement in school has been associated with higher competence in social skills, such as cooperation, self-control, engagement, and motivation (McWayne & Owsianik, 2004).

Family Engagement in Hatch Products

Hatch Early Learning's products provide educators and families with opportunities to co-engage in children's learning. Our products can help to strengthen relationships between educators, families, and children.

Hatch's solutions support family engagement by

- enabling families to support their child's learning at home with both digital and offline learning activities that are easy to implement and do not require the family to have existing background knowledge.
- engaging families in tracking their child's learning progress, viewing their artwork, and receiving learning reports.
- providing a tool for teachers and families to have conversations about children's progress starting with a shared language.

Hatch products offer offline learning activities that families can do with their children at home.

Equitable Access to Learning

We believe that every child, regardless of their background or abilities, deserves equitable and accessible opportunities for learning.

Equity Defined

Equity in education means ensuring that every student has access to the resources and educational rigor they need at the right moment in their education, regardless of race, gender, ethnicity, language, disability, family background, or family income (The Glossary of Education Reform, 2016). Equity is about fairness and inclusion, ensuring that personal or social circumstances are not obstacles to achieving educational potential.

Equity is a fundamental principle of social justice. Ensuring equitable access to quality education helps to break the cycle of poverty, reduces disparities in educational outcomes, and promotes a more just and inclusive society (Pianta et. al, 2009). Research indicates that educational equity can improve national economic performance, increase social cohesion, and foster a more engaged citizenry (Organisation for Economic Cooperation and Development, 2012).

Equitable access to high-quality early childhood education is crucial for ensuring that all children, regardless of their background, have the opportunity to develop these essential skills. Without equitable access, disparities in educational outcomes can widen, particularly for children from underserved communities. By providing every child with a strong start, we can help level the playing field, giving all children the chance to succeed in school and beyond and contributing to a more just and inclusive society.

High-Quality Early Childhood Education

The first step of providing equitable access to high-quality education is understanding what high-quality care is.

Research tells us that quality early childhood education is a strong predictor of kindergarten readiness, which lays the foundation for future academic success. High-quality early childhood education is associated with cognitive skills, social skills, and school achievement (Camilli et al., 2010). Specifically, high-quality early childhood education has been linked to the development of foundational skills for literacy, math, and executive function, as well as social–emotional skills (Ansari & Winsler, 2012; Atteberry et al., 2019; Chien, 2022; Howes et al., 2008; Johnson et al., 2023; Lipsey et al., 2015; Moiduddin et al., 2012; Weiland & Yoshikawa, 2013).

NAEYC has outlined 10 standards for high-quality early childhood education. These early childhood programs and schools must include the following:

- Warm, positive relationships between teachers, families, and children
- An appropriate curriculum that promotes learning and development
- Developmental, cultural, and linguistically appropriate instruction
- Formal and informal assessments of child progress
- The promotion of health and nutrition

- Staff with appropriate qualifications and knowledge to promote learning
- Collaborative relationships with families
- A well-maintained indoor and outdoor environment
- Policies, procedures, and systems to support staff, children, and families (n.d.-b)

Access to High-Quality Early Childhood Education

Equitable access to quality early childhood education can significantly impact a child's long-term academic success, social development, and overall well-being, not only enhancing individual life outcomes but also contributing to a more just and inclusive society (Pianta et al., 2009). However, many children and families in the United States lack equitable access to these high-quality programs.

According to the National Academies of Sciences, Engineering, and Medicine (2019), "there are sizable differences in the availability of high-quality early learning programs and in enrollment between children from lower-income families, families with parents with lower levels of educational attainment, and families in which the parents are not proficient in English and their more advantaged peers" (p. 8). This disparity is often due to socioeconomic factors, geographic location, and a lack of resources, which limit access to early learning opportunities for many children.

Equity in Hatch Products

Hatch Early Learning's products provide children with ample opportunities to learn and grow in an effort to close the achievement gap. Our products are designed so that children can see themselves reflected in our educational materials and see the lives and experiences of people who are different from them.

Hatch's solutions support equity by

- collaborating with educators and curriculum experts to provide digital content aligned with early childhood education standards.
- accommodating diverse learning styles through gamification, personalized learning, adaptive learning technologies, and interactive activities.
- curating content that reflects diverse cultures and experiences, including multilingual options to further support children from different linguistic backgrounds.

Ignite games and IgnitePanel lessons are available in English and Spanish.

- providing opportunities for formative and summative assessments, allowing teachers and families to track progress and gain insights into each child's development.
- creating regular performance feedback loops to ensure continuous improvement.

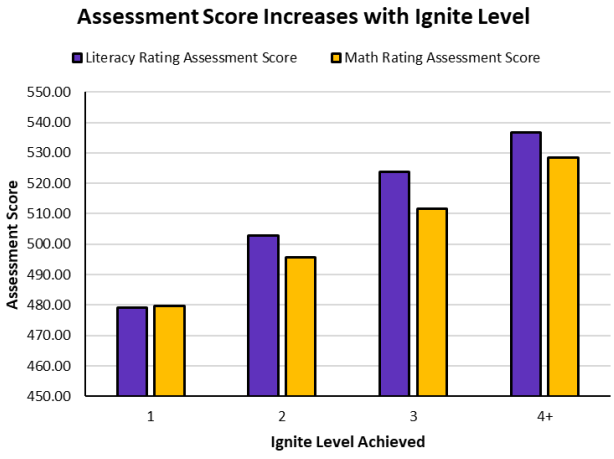
Conclusion

Hatch's Pedagogical Impact

All of our products are designed based on the guiding principles put forth by Hatch's pedagogical philosophy. By adhering to these principles, we ensure that our products are grounded in sound educational practices and learning theories. This alignment allows us to create strong educational opportunities, which, as our research demonstrates, have a significant impact on children's educational experiences and learning outcomes.

Our research shows that by adhering to the guiding principles of our pedagogical philosophy, Hatch products create an engaging learning experience for children. More than 80% of educators who use Hatch products consistently report that their students have fun while playing with Ignite, and 88% report that children are excited to use IgniteTable at school (Hatch Early Learning, 2024). One teacher from Georgia noted, "I love how the students are engaged in the program. They are learning without realizing that they are engaging in assessment/learning" (Polinsky, 2024, p. 11). Beyond supporting children's enjoyment, a recent observational study demonstrated that Ignite maintains children's attention during play. In this study, preschool-aged children were observed playing several games in Ignite. Researchers rated the extent to which Ignite held their attention on a scale of 1 to 5, with 1 indicating complete distraction and 5 indicating full engagement. On average, children's attention to Ignite games was rated a 4.5, showing that Ignite games strongly capture and hold children's attention. These findings underscore the positive impact of Hatch's pedagogical approach on children's learning experiences.

Our research also shows that by adhering to the guiding principles of our pedagogical philosophy, Hatch products support children's learning. Of educators who use Hatch products, 80% consistently report that Ignite prepares children in their preschool classes for kindergarten (Hatch Early Learning, 2024). Additionally, more than 80% of educators report season over season that Ignite helps children practice a diverse set of skills, exposing them to new content, skills, and knowledge as they play (Hatch Early Learning, 2024). Furthermore, Ignite is certified by LXD Research as having promising Every Student Succeeds Act evidence. A recent report on the implementation of Ignite during the 2021–2022 school year by a third-party researcher demonstrates that the more time children spend engaging with Ignite, the more progress they make toward kindergarten-ready levels in the Ignite system (Lambert, 2022). Another report indicates that the progress children achieve in Ignite is associated with their literacy and mathematics skills, as measured by an external assessment



Progress achieved in Ignite is associated with math and literacy achievement as measured by an external assessment.

(LXD Research & Hatch Early Learning, 2023). Essentially, children who achieve higher Ignite levels are also rated by their teachers to have stronger mathematics and literacy skills at the end of the school period (LXD Research & Hatch Early Learning, 2023). This evidence highlights how Hatch's pedagogical principles create learning experiences that help children translate their practice into real-world developmental skills.

Collectively, these findings demonstrate the substantial and positive impact of Hatch's pedagogical principles on both the enjoyment and educational development of children. By adhering to these principles, we ensure that our products not only engage children but also effectively prepare them for success in their continued learning.

Future Outlook

As the landscape of education continues to evolve, Hatch Early Learning is poised to explore a range of innovative directions that will shape the future of early childhood education. The emphasis on personalized learning, integration of emerging technologies, accessibility and equity, professional development for educators, enhanced communication and family engagement, advocacy for early childhood education policies, and ongoing investment in research and development reflects the company's commitment to addressing the diverse and changing needs of learners and educators alike. By focusing on these key areas, Hatch aims to stay at the forefront of educational advancements, ensuring that our products continue to provide meaningful, effective, and inclusive learning experiences for all.

Personalized Learning

The future of education is likely to see a significant shift toward personalized learning through the use of adaptive systems and predictive analytics. Emerging technologies like artificial intelligence (AI) could be utilized to create individualized learning experiences, adjusting content and pacing in real time to meet the unique needs of each student. Additionally, predictive analytics may play a key role in identifying potential learning gaps early on, allowing for timely and targeted interventions. This focus on personalization could lead to more effective and tailored educational experiences, better supporting the diverse needs of all learners.

Integration of Emerging Technologies

The integration of emerging technologies in education is poised to enhance the pedagogical rigor of learning products, potentially offering new ways to support children's development and provide value for educators. As Hatch Early Learning strides into the future, the integration of emerging technologies, such as AI, stands as a central pillar of innovation. These technologies will be harnessed to create immersive, personalized learning experiences that captivate young minds and adapt in real time to each child's learning pace and style. By embedding AI into educational tools and content, Hatch aims to transform traditional learning environments into dynamic spaces that foster deep engagement and joy in learning, preparing children for the increasingly digital world.

By staying attuned to technological advancements, there may be opportunities to incorporate innovative tools that enrich the learning experience, making it more interactive and effective.

These innovative technologies could also contribute to more efficient and insightful support for teachers and administrators, ensuring that educational products continue to evolve in alignment with the latest developments in the field.

Accessibility and Equity

As the field of education evolves, there is likely to be a greater emphasis on accessibility and equity in educational products. Future developments may focus on creating inclusive learning opportunities that address diverse needs, ensuring that all children, regardless of background or ability, have access to high-quality education. Hatch products might reflect these values by exploring solutions that cater to various learning styles and promote equal opportunities for success. This ongoing commitment to accessibility and equity could continue to shape the design and implementation of educational tools and resources.

Recognizing the importance of early childhood education across diverse socioeconomic and cultural contexts, Hatch intends to broaden our reach by offering multilingual support and culturally responsive content. This initiative will not only extend educational opportunities to millions of children but also enrich the educational experience by integrating diverse perspectives and modern early learning practices. Through these efforts, Hatch aspires to be at the forefront of shaping inclusive and comprehensive educational policies that advocate for greater investment in early childhood learning, ensuring that every child, regardless of background, has access to the tools they need for a promising future.

Professional Development for Educators

The future of education is likely to see an increased emphasis on professional development for educators, focusing on continuous learning and collaboration. As educational technologies evolve, there may be a growing demand for platforms that help teachers stay current with new tools and strategies, possibly offering personalized learning paths. Additionally, the development of online communities could play a significant role in enabling teachers to connect, share resources, and support one another through collaborative networks.

Enhanced Communication and Family Engagement

Looking ahead, Hatch plans to develop more robust tools and platforms that facilitate communication and engagement between educators and families. These tools will aim to bridge the gap between home and school, ensuring that families are actively involved in their children's learning journeys and can provide meaningful support. By strengthening this connection, Hatch seeks to foster a more holistic educational experience that includes all stakeholders.

Advocacy for Early Childhood Education Policies

Hatch also intends to actively participate in advocacy for early childhood education policies. The company aims to influence policy decisions that support increased funding and resources for early learning, ensuring that more children have access to high-quality educational opportunities. By engaging in this critical area, Hatch is committed to shaping the broader landscape of early childhood education to benefit all learners.

Ongoing Investment in Research and Development

Hatch Early Learning is dedicated to ongoing investment in research and development to continuously improve and validate the effectiveness of our educational tools. This commitment includes partnerships with academic institutions and educational researchers to study the long-term impact of Hatch's programs and to innovate based on the latest pedagogical research. These efforts will ensure that our products remain at the cutting edge of educational practices, delivering proven results.

In considering these future directions, Hatch Early Learning remains dedicated to our mission of fostering educational excellence through innovation. By embracing personalized learning, integrating emerging technologies, enhancing accessibility and equity, supporting ongoing professional development, fostering family engagement, advocating for early childhood education policies, and investing in research and development, Hatch is prepared to adapt to the evolving demands of the education sector. These efforts will help ensure that we continue to offer impactful solutions that empower educators and support the diverse learning journeys of young children.

References

Albright, M. I., & Weissberg, R. P. (2010). School-family partnerships to promote social and emotional learning. In S. L. Christenson & A. L. Reschly (Eds.), *Handbook of school–family partnerships* (pp. 246–265). New York: Routledge.

Alfieri, L., Brooks, P. J., Aldrich, N. J., & Tenenbaum, H. R. (2011). Does discovery-based instruction enhance learning? *Journal of Educational Psychology*, *103*(1), 1–18. https://doi.org/10.1037/a0021017

Allensworth, E., & Easton, J. Q. (2007). *What matters for staying on-track and graduating in Chicago public high schools: A close look at course grades, failures, and attendance in the freshman year*. University of Chicago Consortium on Chicago School Research. https://consortium.uchicago.edu/sites/default/files/2018-10/07%20What%20Matters%20Final.pdf

Anderson, M. L. (2008). Multiple inference and gender differences in the effects of early intervention: A reevaluation of the Abecedarian, Perry Preschool, and Early Training projects. *Journal of the American Statistical Association*, *103*(484), 1481–1495. https://are.berkeley.edu/~mlanderson/pdf/Anderson%202008a.pdf

Ansari, A., & Winsler, A. (2012). School readiness among low-income, Latino children attending family childcare versus centre-based care. *Early Child Development and Care*, *182*(11), 1465–1485. https://doi.org/10.1080/03004430.2011.622755

Atteberry, A., Bassok, D., & Wong, V. C. (2019). The effects of full-day prekindergarten: Experimental evidence of impacts on children's school readiness. *Educational Evaluation and Policy Analysis*, *41*(4), 537–562. https://doi.org/10.3102/0162373719872197

Balfanz, R., Herzog, L., & Mac Iver, D. J. (2007). Preventing student disengagement and keeping students on the graduation path in urban middle-grades schools: Early identification and effective interventions. *Educational Psychologist*, *42*(4), 223–235. https://doi.org/10.1080/00461520701621079

Bauer, R., & Westmoreland, H. (2019). *What is whole child education?* National PTA, The Center for Family Engagement. https://www.pta.org/docs/default-source/files/cfe/2019/what-is-whole-child-education.pdf

Beachboard, C. (2020, April 3). Help students build intrinsic motivation. *Edutopia*. https://www.edutopia.org/article/help-students-build-intrinsic-motivation/

Berger, C., Alcalay, L., Torretti, A., & Milicic, N. (2011). Socio-emotional well-being and academic achievement: Evidence from a multilevel approach. *Psicologia: Reflexão e Crítica*, *24*(2), 344–351. https://doi.org/10.1590/S0102-79722011000200016

Black, P., & Wiliam, D. (2010). Inside the black box: Raising standards through classroom assessment. *Phi Delta Kappan*, *92*(1), 81–90. https://doi.org/10.1177/003172171009200119

Blair, C., & Peters Razza, R. (2007). Relating effortful control, executive function, and false belief understanding to emerging math and literacy ability in kindergarten. *Child Development*, *78*(2), 647–663. https://doi.org/10.1111/j.1467-8624.2007.01019.x

Brabeck, M., Jeffrey, J., & Fry, S. (2015). Practice for knowledge acquisition (not drill and kill). *American Psychological Association*. https://www.apa.org/education-career/k12/practice-acquisition

Broadfoot, P., Daugherty, R., Gardner, J., Harlen, W., James, M., & Stobart, G. (2002). *Assessment for learning: 10 principles. Research-based principles to guide classroom practice*. Assessment Reform Group, Nuffield Foundation, & University of Cambridge. http://assessmentreformgroup.files.wordpress.com/2012/01/10principles_english.pdf

Brown, S. W., & Bennett, E. (2002). The role of practice and automaticity in temporal and nontemporal dual-task performance. *Psychological Research*, *66*, 80–89. https://doi.org/10.1007/s004260100076

Brunner, C., Fasca, C., Heinze, J., Honey, M., Light, D., Mandinach, E., & Wexler, D. (2005). Linking data and learning: The Grow Network study. *Journal of Education for Students Placed at Risk*, *10*(3), 241–267. https://doi.org/10.1207/s15327671espr1003_2

Cambridge International Education Teaching and Learning Team. (n.d.). *Getting started with assessment for learning*. Cambridge Assessment International Education. https://cambridge-community.org.uk/professional-development/gswafl/index.html

Camilli, G., Vargas, S., Ryan, S., & Barnett, W. S. (2010). Meta-analysis of the effects of early education interventions on cognitive and social development. *Teachers College Record*, *112*(3), 579–620. https://doi.org/10.1177/016146811011200303

Cejudo, J., Rodrigo-Ruiz, D., López-Delgado, M. L., & Losada, L. (2018). Emotional intelligence and its relationship with levels of social anxiety and stress in adolescents. *International Journal of Environmental Research and Public Health*, *15*(6), 1073. https://doi.org/10.3390/ijerph15061073

Center on the Developing Child. (2012). *InBrief: Executive function* (Brief). Harvard University. https://developingchild.harvard.edu/resources/inbrief-executive-function/

Chafouleas, S. M., & Iovino, E. A. (2021). Engaging a whole child, school, and community lens in positive education to advance equity in schools. *Frontiers in Psychology*, *12*, Article 758788. https://doi.org/10.3389/fpsyg.2021.758788

Chen, W. (2024). Problem-solving skills, memory power, and early childhood mathematics: Understanding the significance of the early childhood mathematics in an individual's life. *Journal of the Knowledge Economy*. https://doi.org/10.1007/s13132-023-01557-6

Chi, M. T. H. (2009). Active-constructive-interactive: A conceptual framework for differentiating learning activities. *Topics in Cognitive Science*, *1*(1), 73–105. https://doi.org/10.1111/j.1756-8765.2008.01005.x

Chien, N. (2022). *Factsheet: Estimates of child care eligibility & receipt for fiscal year 2019*. U.S. Department of Health and Human Services, Office of the Assistant Secretary for Planning & Evaluation. https://aspe.hhs.gov/sites/default/files/documents/1d276a590ac166214a5415bee430d5e9/cy2019-child-care-subsidy-eligibility.pdf

Claessens, A., & Engel, M. (2013). How important is where you start? Early mathematics knowledge and later school success. *Teachers College Record*, *115*(6), 1–29. https://doi.org/10.1177/016146811311500603

Collaborative for Academic, Social, and Emotional Learning. (n.d.). *Fundamentals of SEL*. https://casel.org/fundamentals-of-sel/

Davis-Kean, P. E., Domina, T., Kuhfeld, M., Ellis, A., & Gershoff, E. T. (2021). It matters how you start: Early numeracy mastery predicts high school math course-taking and college attendance. *Infant and Child Development*, *31*(2), Article e2281. https://doi.org/10.1002/icd.2281

Deci, E. L., & Ryan, R. M. (2000). The "what" and "why" of goal pursuits: Human needs and the self-determination of behavior. *Psychological Inquiry*, *11*(4), 227–268. https://doi.org/10.1207/S15327965PLI1104_01

Dickinson, D. K., & Porche, M. V. (2011). Relation between language experiences in preschool classrooms and children's kindergarten and fourth-grade language and reading abilities. *Child Development*, *82*(3), 870–886. https://doi.org/10.1111/j.1467-8624.2011.01576.x

Duncan, G. J., Dowsett, C. J., Claessens, A., Magnuson, K., Huston, A. C., Klebanov, P., Pagani, L. S., Feinstein, L., Engel, M., Brooks-Gunn, J., Sexton, H., Duckworth K., & Japel, C. (2007). School readiness and later achievement. *Developmental Psychology*, *43*, 1428–1446. https://doi.org/10.1037/0012-1649.43.6.1428

Durlak, J. A., Weissberg, R. P., Dymnicki, A. B., Taylor, R. D., & Schellinger, K. B. (2011). The impact of enhancing students' social and emotional learning: A meta-analysis of school-based universal interventions. *Child Development*, *82*(1), 405–432. https://doi.org/10.1111/j.1467-8624.2010.01564.x

Eberly Center for Teaching Excellence and Educational Innovation. (n.d.). *What is the difference between formative and summative assessment?* Carnegie Mellon University. https://www.cmu.edu/teaching/assessment/basics/formative-summative.html

Erdem, C., & Kaya, M. (2020). A meta-analysis of the effect of parental involvement on students' academic achievement. *Journal of Learning for Development*, *7*(3), 367–383. https://doi.org/10.56059/jl4d.v7i3.417

Ericsson, K. A. (2006). The influence of experience and deliberate practice on the development of superior expert performance. In K. A. Ericsson, N. Charness, P. Feltovich, & R. Hoffman (Eds.), *The Cambridge handbook of expertise and expert performance* (pp. 685–705). Cambridge University Press. https://doi.org/10.1017/CBO9780511816796

Ericsson, K. A., & Pool, R. (2016). *Peak: Secrets from the new science of expertise*. HarperOne.

Ericsson, K. A., Krampe, R. T., & Tesch-Römer, C. (1993). The role of deliberate practice in the acquisition of expert performance. *Psychological Review*, *100*(3), 363–406. https://doi.org/10.1037/0033-295X.100.3.363

Farrington, C. A., Roderick, M., Allensworth, E., Nagaoka, J., Keyes, T. S., Johnson, D. W., & Beechum, N. O. (2012). *Teaching adolescents to become learners: The role of noncognitive factors in shaping school performance—A critical literature review*. University of Chicago Consortium on Chicago School Research. https://www.kipp.org/wp-content/uploads/2016/11/Teaching_Adolescents_to_Become_Learners.pdf

Fisher, K. R., Hirsh-Pasek, K., Golinkoff, R. M., Singer, D. G., & Berk, L. (2010). Playing around in school: Implications for learning and educational policy. In P. Nathan & A. D. Pellegrini (Eds.), *The Oxford handbook of the development of play* (pp. 342–360). Oxford University Press.

Foorman, B., Petscher, Y., & Herrera, S. (2018). Unique and common effects of decoding and language factors in predicting reading comprehension in grades 1–10. *Learning and Individual Differences*, *63*, 12–23. https://doi.org/10.1016/j.lindif.2018.02.011

Forman, M. L. (2007). Developing an action plan: Two Rivers Public Charter School focuses on instruction. In K. P. Boudett & J. L. Steele (Eds.), *Data wise in action: Stories of schools using data to improve teaching and learning* (pp. 107–124). Harvard Education Press.

Fuchs, D., & Fuchs, L. S. (2006). Introduction to response to intervention: What, why, and how valid is it? *Reading Research Quarterly*, *41*(1), 93–99. https://doi.org/10.1598/RRQ.41.1.4

Fullan, M. (2011). *Choosing the wrong drivers for whole system reform* (Seminar Series Paper No. 204). Centre for Strategic Education. https://edsource.org/wp-content/uploads/old/Fullan-Wrong-Drivers11.pdf

Galindo, C., & Sheldon, S. B. (2012). School and home connections and children's kindergarten achievement gains: The mediating role of family involvement. *Early*

Childhood Research Quarterly, *27*(1), 90–103. https://doi.org/10.1016/j.ecresq.2011.05.004

Ghafouri, F., & Wien, C. A. (2005). "Give us a privacy": Play and social literacy in young children. *Journal of Research in Childhood Education*, *19*(4), 279–291. https://doi.org/10.1080/02568540509595076

Glover, J. A., Ronning, R. R., & Bruning, R. H. (1990). *Cognitive psychology for teachers*. Macmillan.

Golinkoff, R. M., & Hirsh-Pasek, K. (2016). *Becoming brilliant: What science tells us about raising successful children*. American Psychological Association. https://doi.org/10.1037/14917-000

Graue, E., Clements, M. A., Reynolds, A. J., & Niles, M. D. (2004). More than teacher directed or child initiated: Preschool curriculum type, parent involvement, and children's outcomes in the child-parent centers. *Education Policy Analysis Archives*, *12*(72), 1–38. https://doi.org/10.14507/epaa.v12n72.2004

Halverson, R., Prichett, R. B., & Watson, J. G. (2007). *Formative feedback systems and the new instructional leadership* (Working Paper No. 2007-3). Wisconsin Center for Education Research. https://files.eric.ed.gov/fulltext/ED497265.pdf

Hamilton, L., Halverson, R., Jackson, S. S., Mandinach, E., Supovitz, J. A., & Wayman, J. C. (2009). *Using student achievement data to support instructional decision making* (NCEE 2009-4067). U.S. Department of Education, Institute of Education Sciences, National Center for Education Evaluation and Regional Assistance. https://ies.ed.gov/ncee/wwc/Docs/PracticeGuide/dddm_pg_092909.pdf

Harvard Graduate School of Education. (2016, September 11). *Intrinsically motivated*. https://www.gse.harvard.edu/ideas/usable-knowledge/16/09/intrinsically-motivated

Hatch Early Learning. (2024). *Research summary for Florida educators* (Ignite by Hatch™ Data Report). https://www.hatchearlylearning.com/ignite-by-hatch-research-summary

Hattie, J., & Timperley, H. (2007). The power of feedback. *Review of Educational Research*, *77*(1), 81–112. https://doi.org/10.3102/003465430298487

Henderson, A. T., & Mapp, K. L. (2002). *A new wave of evidence: The impact of school, family, and community connections on student achievement*. Southwest Educational Development Laboratory, The National Center for Family and Community Connections. https://sedl.org/connections/resources/evidence.pdf

Hirsh-Pasek, K. (1991). Pressure or challenge in preschool? How academic environments affect children. *New Directions for Child Development*, *53*, 39–46. https://doi.org/10.1002/cd.23219915307

Hirsh-Pasek, K., & Hadani, H. (2020). A new path to education reform: Playful learning promotes 21st-century skills in schools and beyond. *Brookings*. https://www.brookings.edu/wp-content/uploads/2020/10/Big-Ideas_Hirsh-Pasek_PlayfulLearning.pdf

Hirsh-Pasek, K., Golinkoff, R. M., Berk, L. E., & Singer, D. G. (2009). *A mandate for playful learning in preschool: Presenting the evidence*. Oxford University Press. https://doi.org/10.1093/acprof:oso/9780195382716.001.0001

Hirsh-Pasek, K., Zosh, J. M., Golinkoff, R. M., Gray, J. H., Robb, M. B., & Kaufman, J. (2015). Putting education in "educational" apps: Lessons from the science of learning. *Psychological Science in the Public Interest*, *16*(1), 3–34. https://doi.org/10.1177/1529100615569721

Howes, C., Burchinal, M., Pianta, R., Bryant, D., Early, D., Clifford, R., & Barbarin, O. (2008). Ready to learn? Children's pre-academic achievement in pre-kindergarten programs. *Early Childhood Research Quarterly*, *23*(1), 27–50. https://doi.org/10.1016/j.ecresq.2007.05.002

Huffman, L. R., & Speer, P. W. (2000). Academic performance among at-risk children: The role of developmentally appropriate practices. *Early Childhood Research Quarterly*, *15*(2), 167–184. https://doi.org/10.1016/S0885-2006(00)00048-X

Isen, A. M. (2001). An influence of positive affect on decision making in complex situations: Theoretical issues with practical implications. *Journal of Consumer Psychology*, *11*(2), 75–85. https://doi.org/10.1207/S15327663JCP1102_01

Jeynes, W. (2012). A meta-analysis of the efficacy of different types of parental involvement programs for urban students. *Urban Education*, *47*(4), 706–742. https://doi.org/10.1177/004208591244564

Johnson, A. D., Partika, A., Martin, A., Horm, D., Phillips, D. A., & Tulsa SEED Study Team. (2023). A deeper dive, a wider pool: Preschool benefits sustain to first grade on a broader set of outcomes. *Child Development*, *94*(5), 1298–1318. https://doi.org/10.1111/cdev.13928

Jones, D. E., Greenberg, M., & Crowley, M. (2015). Early social-emotional functioning and public health: The relationship between kindergarten social competence and future wellness. *American Journal of Public Health*, *105*(11), 2283–2290. https://doi.org/10.2105/AJPH.2015.302630

Kalchman, M., Moss, J., & Case, R. (2001). Psychological models for the development of mathematical understanding: Rational numbers and functions. In S. M. Carver & D. Klahr (Eds.), *Cognition and instruction: Twenty-five years of progress* (pp. 1–38). Lawrence Erlbaum Associates Publishers.

Kikas, E., Pakarinen, E., Soodla, P., Peets, K., & Lerkkanen, M.-K. (2018). Associations between reading skills, interest in reading, and teaching practices in first grade. *Scandinavian*

Journal of Educational Research, *62*(6), 832–849. https://doi.org/10.1080/00313831.2017.1307272

Kim, S. W., & Hill, N. E. (2015). Including fathers in the picture: A meta-analysis of parental involvement and students' academic achievement. *Journal of Educational Psychology*, *107*(4), 919–934. https://doi.org/10.1037/edu0000023

Kraft, M. A., & Rogers, T. (2014). The underutilized potential of teacher-to-parent communication: Evidence from a field experiment. *Economics of Education Review*, *47*, 49–63. https://doi.org/10.1016/j.econedurev.2015.04.001

Ladd, G. W., & Dinella, L. M. (2009). Continuity and change in early school engagement: Predictive of children's achievement trajectories from first to eighth grade. *Journal of Educational Psychology*, *101*(1), 190–206. https://doi.org/10.1037/a0013153

LaForett, D. R., Halle, T., & Vivrette, R. (2023, June 28). Research shows how developmentally appropriate practice helps early childhood educators support all children. *Child Trends*. https://doi.org/10.56417/1805i6586q

Lambert, R. (2022). *Formative evaluation of the Ignite games for young children from Hatch Early Learning* (CEMETR-2022-06). The University of North Carolina at Charlotte, Center for Educational Measurement and Evaluation. https://ceme.charlotte.edu/wp-content/uploads/sites/39/2024/01/Full-Year-Report-November-2023-combined.pdf

Lerkkanen, M.-K., Kiuru, N., Pakarinen, E., Poikkeus, A.-M., Rasku-Puttonen, H., Siekkinen, M., & Nurmi, J.-E. (2016). Child-centered versus teacher-directed teaching practices: Associations with the development of academic skills in the first grade at school. *Early Childhood Research Quarterly*, *36*, 145–156. https://doi.org/10.1016/j.ecresq.2015.12.023

Lerkkanen, M.-K., Kiuru, N., Pakarinen, E., Viljaranta, J., Poikkeus, A.-M., Rasku-Puttonen, H., Siekkinen, M., & Nurmi, J.-E. (2012). The role of teaching practices in the development of children's interest reading and mathematics in kindergarten. *Contemporary Educational Psychology*, *37*(4), 266–279. https://doi.org/10.1016/j.cedpsych.2011.03.004

Li-Grining, C. P., Votruba-Drzal, E., Maldonado-Carreño, C., & Haas, K. (2010). Children's early approaches to learning and academic trajectories through fifth grade. *Developmental Psychology*, *46*(5), 1062–1077. https://doi.org/10.1037/a0020066

Lipsey, M. W., Farran, D. C., & Hofer, K. G. (2015). *A randomized control trial of a statewide voluntary prekindergarten program on children's skills and behaviors through third grade* (Research Report). Vanderbilt University, Peabody Research Institute. https://cdn.vanderbilt.edu/vu-my/wp-content/uploads/sites/1147/2013/10/14112801/VPKthrough3rd_final_withcover.pdf

LXD Research & Hatch Early Learning. (2023). *Ignite by Hatch™ ESSA evidence packet*. https://7803303.fs1.hubspotusercontent-

na1.net/hubfs/7803303/Hatch%20Resources/Research%20Assests/ESSA_Ignite_Evidence_Packet_v1.pdf

Ma, X., Shen, J., Krenn, H. Y., Hu, S., & Yuan, J. (2015). A meta-analysis of the relationship between learning outcomes and parental involvement during early childhood education and early elementary education. *Educational Psychology Review*, *28,* 771–801. https://doi.org/10.1007/s10648-015-9351-1

Marcon, R. A. (1993). Socioemotional versus academic emphasis: Impact on kindergartners' development and achievement. *Early Child Development and Care*, *96*(1), 81–91. https://doi.org/10.1080/0300443930960108

Marcon, R. A. (2002). Moving up the grades: Relationship between preschool model and later school success. *Early Childhood Research & Practice*, *4*(1). https://files.eric.ed.gov/fulltext/ED464762.pdf

Mardell, B., Wilson, D., Ryan, J., Ertel, K., Krechevsky, M., & Baker, M. (2016, July). *Towards a pedagogy of play: A Project Zero working paper*. Harvard Graduate School of Education, Project Zero. https://pz.harvard.edu/sites/default/files/Towards%20a%20Pedagogy%20of%20Play.pdf

McCoach, D. B., O'Connell, A. A., Reis, S. M., & Levitt, H. A. (2006). Growing readers: A hierarchical linear model of children's reading growth during the first 2 years of school. *Journal of Educational Psychology*, *98*(1), 14. https://doi.org/10.1037/0022-0663.98.1.14

McDaniel, M. A., & Schlager, M. S. (1990). Discovery learning and transfer of problem-solving skills. *Cognition and Instruction*, *7*(2), 129–159. https://www.jstor.org/stable/3233474

McIntosh, S., & Vignoles, A. (2001). Measuring and assessing the impact of basic skills on labour market outcomes [Special issue]. *Oxford Economic Papers*, *53*(3), 453–481. https://www.jstor.org/stable/3488628

McWayne, C., & Owsianik, M. (2004). *Parent involvement and the social and academic competencies of urban kindergarten children*. Harvard Family Research Project, Family Involvement Research Digests. https://archive.globalfrp.org/publications-resources/browse-our-publications/parent-involvement-and-the-social-and-academic-competencies-of-urban-kindergarten-children

Moiduddin, E., Aikens, N., Tarullo, L., West, J., & Xue, Y. (2012). *Child outcomes and classroom quality in FACES 2009* (OPRE Report 2012-37a). U. S. Department of Health and Human Services, Administration for Children and Families, Office of Planning, Research & Evaluation. https://files.eric.ed.gov/fulltext/ED539265.pdf

Moors, A., & De Houwer, J. (2006). Automaticity: A theoretical and conceptual analysis. *Psychological Bulletin*, *132*(2), 297–326. https://doi.org/10.1037/0033-2909.132.2.297

National Academies of Sciences, Engineering, and Medicine. (2019). *Monitoring educational equity*. The National Academies Press. https://doi.org/10.17226/25389

National Association for Family, School, and Community Engagement. (n.d.). *Family engagement defined*. https://nafsce.org/page/definition

National Association for the Education of Young Children. (n.d.-a). *DAP: Defining developmentally appropriate practice*. https://www.naeyc.org/resources/position-statements/dap/definition

National Association for the Education of Young Children. (n.d.-b). Defining and recognizing high-quality early learning programs: NAEYC's 10 accreditation standards. NAEYC. https://www.naeyc.org/defining-recognizing-high-quality-early-learning-programs

National Association for the Education of Young Children. (n.d.-c). *Developmentally appropriate practice* [Position statement]. https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/dap-statement_0.pdf

National Association for the Education of Young Children. (2009). *Developmentally appropriate practice in early childhood programs serving children from birth through age 8* [Position statement]. https://www.naeyc.org/sites/default/files/globally-shared/downloads/PDFs/resources/position-statements/PSDAP.pdf

National Center on Safe Supportive Learning Environments. (n.d.). *Developmentally appropriate practice*. https://safesupportivelearning.ed.gov/training-technical-assistance/education-level/early-learning/developmentally-appropriate-practice

National Early Literacy Panel. (2008). *Developing early literacy: Report of the National Early Literacy Panel*. U.S. Department of Health and Human Services, National Center for Family Literacy. https://lincs.ed.gov/publications/pdf/NELPReport09.pdf

National Research Council. (1998). *Preventing reading difficulties in young children*. The National Academies Press.

National Research Council. (2001). *Adding it up: Helping children learn mathematics*. The National Academies Press.

National Research Council. (2012). *Education for life and work: Developing transferable knowledge and skills in the 21st century*. The National Academies Press.

National Scientific Council on the Developing Child. (2009). *Young children develop in an environment of relationships* (Working Paper No. 1). https://developingchild.harvard.edu/wp-content/uploads/2004/04/Young-Children-Develop-in-an-Environment-of-Relationships.pdf

Organisation for Economic Cooperation and Development. (2012). *Equity and quality in education: Supporting disadvantaged students and schools*. https://doi.org/10.1787/9789264130852-en

Pace, A., Alper, R., Burchinal, M. R., Golinkoff, R. M., & Hirsh-Pasek, K. (2019). Measuring success: Within and cross-domain predictors of academic and social trajectories in elementary school. *Early Childhood Research Quarterly*, 46, 112–125. https://doi.org/10.1016/j.ecresq.2018.04.001

Pakarinen, E., & Kikas, E. (2019). Child-centered and teacher-directed practices in relation to calculation and word problem solving skills. *Learning and Individual Differences*, *70*, 76–85. https://doi.org/10.1016/j.lindif.2019.01.008

Piaget, J. (1968). *Six psychological studies*. Vintage Books.

Piaget, J. (1970). *Science of education and the psychology of the child*. Orion Press.

Pianta, R. C., Barnett, W. S., Burchinal, M., & Thornburg, K. R. (2009). The effects of preschool education: What we know, how public policy is or is not aligned with the evidence base, and what we need to know. *Psychological Science in the Public Interest*, *10*(2), 49–88. https://doi.org/10.1177/1529100610381908

Planty, M., Hussar, W., Snyder, T., Kena, G., KewalRamani, A., Kemp, J., Bianco, K., & Dinkes, R. (2009). *The condition of education 2009* (NCES 2009-081). U.S. Department of Education, Institute of Education Sciences, National Center for Education Statistics. https://nces.ed.gov/pubs2009/2009081.pdf

Polinsky, N. (2024). *Playful learning over the summer: Ignite by Hatch™ supports academic practice and fun in a large statewide summer program*. Hatch Early Learning. https://7803303.fs1.hubspotusercontent-na1.net/hubfs/7803303/Hatch%20Resources/Research%20Assests/Ignite%20by%20Hatch%20GA%20DECAL%2002.2024-1.pdf

Ponitz, C. C., Rimm-Kaufman, S. E., Grimm, K. J., & Curby, T. W. (2009). Kindergarten classroom quality, behavioral engagement, and reading achievement. *School Psychology Review*, *38*(1), 102–120. https://doi.org/10.1080/02796015.2009.12087852

Portilla, X. A., Ballard, P. J., Adler, N. E., Boyce, W. T., & Obradović, J. (2014). An integrative view of school functioning: Transactions between self-regulation, school engagement, and teacher–child relationship quality. *Child Development*, *85*(5), 1915–1931. https://doi.org/10.1111/cdev.12259

Ramani, G. B. (2012). Influence of a playful, child-directed context on preschool children's peer cooperation. *Merrill-Palmer Quarterly*, *58*(2), 159–190. https://doi.org/10.1353/mpq.2012.0011

Reeves, D. B. (2004). *Accountability for learning: How teachers and school leaders can take charge*. Association for Supervision and Curriculum Development.

Robinson, K., & Mueller, A. S. (2014). Behavioral engagement in learning and math achievement over kindergarten: A contextual analysis. *American Journal of Education*, *120*(3), 325–349. https://doi.org/10.1086/675530

Schildkamp, K., van der Kleij, F. M., Heitink, M. C., Kippers, W. B., & Veldkamp, B. P. (2020). Formative assessment: A systematic review of critical teacher prerequisites for classroom practice. *International Journal of Educational Research*, *103*, Article 101602. https://doi.org/10.1016/j.ijer.2020.101602

Schweinhart, L. J., & Weikart, D. P. (1988). Education for young children living in poverty: Child-initiated learning or teacher-directed instruction? *The Elementary School Journal*, *89*(2), 212–225. https://www.journals.uchicago.edu/doi/10.1086/461574

Sénéchal, M., & Young, L. (2008). The effect of family literacy interventions on children's acquisition of reading from kindergarten to grade 3: A meta-analytical review. *Review of Educational Research*, *78*(4), 880–907. https://doi.org/10.3102/0034654308320319

Shen, Z., Popov, V., Delahay, A. B., & Reder, L. M. (2017). Item strength affects working memory capacity. *Memory & Cognition*, *46*, 204–215. https://doi.org/10.3758/s13421-017-0758-4

Slade, S., & Griffith, D. (2013). A whole child approach to student success. *KEDI Journal of Educational Policy*, *10*(3), 21–35. https://selinschools.org/wp-content/uploads/2015/08/0924KJEP-FINAL.pdf

Smith, P. K. (2005). Social and pretend play in children. In A. D. Pellegrini & P. K. Smith (Eds.), *The nature of play: Great apes and humans* (pp. 173–209). Guilford Press.

Stanovich, K. E., Nathan, R. G., & Vala-Rossi, M. (1986). Developmental changes in the cognitive correlates of reading ability and the developmental lag hypothesis. *Reading Research Quarterly*, *21*(3), 267–283. https://doi.org/10.2307/747709

Stipek, D., & Johnson, N. (2020). Developmentally appropriate practice in early childhood education redefined: The case of math. In S. Ryan, M. E. Graue, V. L. Gadsden, & F. J. Levin (Eds.), *Advancing knowledge and building capacity for early childhood research* (pp. 35–54). American Educational Research Association.

Stipek, D., Feiler, R., Daniels, D., & Milburn, S. (1995). Effects of different instructional approaches on young children's achievement and motivation. *Child Development*, *66*(1), 209–223. https://doi.org/10.1111/j.1467-8624.1995.tb00866.x

Supovitz, J. A., & Klein, V. (2003). *Mapping a course for improved student learning: How innovative schools systematically use student performance data to guide improvement*. The Consortium for Policy Research in Education.

https://repository.upenn.edu/entities/publication/a7fa6153-d28a-4595-baca-75045c1e1d29

Sztabnik, B. (2015, May 7). A new definition of rigor. *Edutopia*. https://www.edutopia.org/blog/a-new-definition-of-rigor-brian-sztabnik

The Glossary of Education Reform. (2016, March 21). *Equity*. https://www.edglossary.org/equity

Van Voorhis, F. L., Maier, M. F., Epstein, J. L., & Lloyd, C. M. (2013). *The impact of family involvement on the education of children ages 3 to 8: A focus on literacy and math achievement outcomes and social-emotional skills*. MDRC. http://www.mdrc.org/sites/default/files/The_Impact_of_Family_Involvement_FR.pdf

Vaughn, S., & Fletcher, J. (2023). The practice gap. *Perspectives on Language and Literacy*, *49*(1), 15–17. https://ohiop20litcollab.org/wp-content/uploads/2023/10/Article-by-Vaughn-and-Fletcher.pdf

Vignoles, A., De Coulon, A., & Marcenaro-Gutierrez, O. (2011). The value of basic skills in the British labour market. *Oxford Economic Papers*, *63*(1), 27–48. https://doi.org/10.1093/oep/gpq012

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Harvard University Press.

Wagner, T. (2008). *The global achievement gap: Why even our best schools don't teach the new survival skills our children need—and what we can do about it*. Basic Books.

Wayman, J. C., & Stringfield, S. (2006). Technology-supported involvement of entire faculties in examination of student data for instructional improvement. *American Journal of Education*, *112*(4), 549–571. http://dx.doi.org/10.1086/505059

Wayman, J. C., Cho, V., Jimerson, J. B., & Spikes, D. D. (2012). District-wide effects on data use in the classroom. *Education Policy Analysis Archives*, *20*, 2–31. https://doi.org/10.14507/epaa.v20n25.2012

Wayman, J. C., Spikes, D., & Volonnino, M. R. (2013). Implementation of a data initiative in the NCLB era. In K. Schildkamp, M. K. Lai, & L. Earl (Eds.), *Data-based decision making in education*: Challenges and opportunities (pp. 135–153). Springer.

Weiland, C., & Yoshikawa, H. (2013). Impacts of a prekindergarten program on children's language, literacy, executive function, and emotional skills. *Child Development*, *84*(6), 2112–2130. https://doi.org/10.1111/cdev.12099

Weisberg, D. S., Kittredge, A. K., Hirsh-Pasek, K., Golinkoff, R. M., & Klahr, D. (2015). Making play work for education. *Phi Delta Kappan*, *96*(8), 8–13. https://doi.org/10.1177/0031721715583955

Williford, A. P., Maier, M. F., Downer, J. T., Pianta, R. C., & Howes, C. (2013). Understanding how children's engagement and teachers' interactions combine to predict school readiness. *Journal of Applied Developmental Psychology*, *34*(6), 299–309. https://doi.org/10.1016/j.appdev.2013.05.002

Zosh, J. M., Gaudreau, C., Golinkoff, R. M., & Hirsh-Pasek, K. (2022). The power of playful learning in the early childhood setting. *Young Children*, *77*(2). https://www.naeyc.org/resources/pubs/yc/summer2022/power-playful-learning

Zosh, J. M., Hirsh-Pasek, K., Hopkins, E. J., Jensen, H., Liu, C., Neale, D., Solis, S. L., & Whitebread, D. (2018). Accessing the inaccessible: Redefining play as a spectrum. *Frontiers in Psychology*, *9*, 1124. https://doi.org/10.3389/fpsyg.2018.01124