The Power of Purposeful Play in Primary Grades: Adjusting Pedagogy for Children's Needs and Academic Gains

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Abstract

The amount of intentional, instructional, purposeful play has decreased in primary grades, and didactic, test-driven instruction has increased. Emerging neuroscientific evidence is beginning to highlight the significant effects the toxic stress from poverty has on developing brains. Almost half of American children can be considered to come from low-income to high-poverty households. Purposeful play may be the best solution to help ensure an equal and equitable educational playing field. This reflection establishes a research-based rationale for a more play-based pedagogy in primary grades and posits how striking balance between purposeful play and rigorous educational expectations is key to better developmental outcomes.

Keywords

childhood, purposeful play, achievement, curriculum, equity, human development, social-emotional, teaching

> Almost all creativity involves purposeful play.
>
> —Abraham Maslow, 1908–1970

Certainly, everything old is new again. Calls for a return to a less-structured approach in regard to primary curriculum might suggest the tide is turning. Recent titles, such as "Why Kindergarten is the New First Grade" (Nadworny et al., 2018), signal a time ripe for a bold, yet old, approach emphasizing play, coupled with the rigor of standards and accountability.

This manuscript sets forth a research-based argument for a pedagogy of play in primary grades (K–2) that echoes the old, even ancient, practices of play, yet rests firmly on new neuroeducational research. Gleaned in the past decade, neuroeducational insights indicate that executive functions (EFs) and self-regulation (SR), also related to social-emotional skills, are strongly correlated with both school readiness and academic achievement (Moreno et al., 2017). EF skills manifest as the ability to follow directions, to take turns, to engage in prosocial problem-solving, and to sustain attention on a challenging task, among other things (Center on the Developing Child at Harvard University, 2011, 2017; Gathercole & Alloway, 2007). EF can be defined as domain-specific mental skills that allow for task completion and SR. Management of EF occurs in the prefrontal cortex of the brain, and the tasks or skills include working memory, judgment, differentiation, anticipating outcomes, time management, the ability to pay attention and switch focus, the ability to plan and organize, remembering details, and SR. Researchers believe early childhood is a critical development period for EF skills and that these skills are critical for school readiness (Blair, 2016; Blair & Raver, 2015; Fitzpatrick et al., 2014):

> The neuroanatomical structure of the [prefrontal cortex] PFC in humans undergoes considerable maturation during early childhood. In particular, it can be characterized by a reduction of synaptic and neuronal density, a growth of dendrites, and an increase in both gray and white matters. Perhaps through these processes, the PFC forms the basic neural circuitry, especially the distributed networks appropriate for higher cognitive functions. Thus, the period from early childhood to preschool age should be important in the development of cognitive functions related to the PFC. (Tsujimoto, 2008, pp. 346–347)

Researchers also discovered powerfully strong statistical correlations among poverty, stress, and chaos that diminish capacity in EF, SR, and social-emotional development (SED) (Ackerman et al., 2004b; Blair & Raver,

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2015, 2016; Fitzpatrick et al., 2014; Lally & Mangione, 2017, 2016; Raver et al., 2012; Shonkoff, 2011, 2017). Positive approaches to learning, EF, SR, and SED appear critical for school readiness (Blair, 2016; Blair & Raver, 2015; Brown & Low, 2008; Fitzpatrick et al., 2014; Rathbun & West, 2004; Zill & West, 2001), as well as for developing language skills, foundational early literacy skills, and early conceptual math skills (Ackerman et al., 2004a; Bernhard et al., 2008; Engle & Black, 2008; Huang & Invernizzi, 2012; Sood & Jitendra, 2013; Yoshikawa et al., 2013).

Based on kindergarten entry assessments and primary assessments of children's social-emotional behaviors, approaches to learning, foundational academic knowledge, and abilities to meet the expectations of school, everyday educators very quickly identify children as either ready and capable, or not. This inflexible identification influences the instructional grouping patterns, content exposure, and strategies for instruction early on, which often continues through K–12 creating a self-fulfilling prophecy (Brooks-Gunn & Duncan, 1997; Duncan et al., 1998). In addition, poor SR and less-developed SED contribute to overrepresentation of children from low-income backgrounds, a disproportionate amount of children of color, in exceptional education programs (Moreno & Gaytan, 2013; Raines et al., 2012), higher frequencies of behaviors not conducive to learning, exclusionary discipline practices (Bodovski et al., 2013; Christofferson & Callahan, 2015; Wyman et al., 2010), and greater retention and dropout rates (Child Trends Data Bank, 2016; Duncan et al., 1998; Engle & Black, 2008). When children are spending excessive instructional minutes in time-out, referred to administration, suspended from school, or even absent because of a persistent lack of success, these factors lead to reduced instructional support. The results further widen an already alarming academic achievement gap between at-risk children entering school and their more advantaged peers in the primary grades which is compounded throughout students' K–12 experiences (Blair & Raver, 2015; Engle & Black, 2008).

As former public school kindergarten and primary grade teachers who currently conduct research and prepare elementary preservice teachers, much of the authors' professional lives have been focused on primary grades. From the mid-1990s through the legislation of No Child Left Behind (NCLB, 2002) to today, many have witnessed the shift in approaches to teaching and measuring learning. Since the 1990s, kindergarten teachers now report having increased academic expectations at kindergarten entry. They expect children to be reading by the end of kindergarten, spend less time on music and art lessons, have fewer opportunities for discovery or play, and use workbooks daily (Bassok et al., 2016). This piece establishes a research-based rationale for more playful pedagogy in primary grades. To accomplish this, this article explores what purposeful play is; why play is important in primary grades; and then posits how striking balance between purposeful play and rigorous educational expectations is key.

What is Purposeful Play?

> Play is so integral to childhood that a child who does not have the opportunities to play is cut off from a major portion of childhood. (Musselwhite, 1986)

The current debate over the most appropriate pedagogical approach for teaching children in primary grades is often seen as purely dichotomous. The perception is teachers either choose to implement standards and accountability-driven instruction that is prescribed, detailed, academic, and rigorous, or they allow young children to play with complete autonomy to define both what and how they want to learn with little adult interference or guidance. Yet, a middle way exists. Incorporating a pedagogy of play is often similarly seen as a dichotomous choice; teachers can either implement highly structured, teacher-directed, rules-based play or completely unstructured, free-range, independent play without adult intervention. The terms, purposeful play or guided play, are often used interchangeably, but both commonly offer freedom of choice, discovery, and exploration within adult-facilitated structure (Hassinger-Das et al., 2017; Massey, 2013; Mraz et al., 2016; Weisberg et al., 2013, 2016). This manuscript focuses on making a research-based argument for teacher-guided, purposeful play which is planned and facilitated to achieve learning outcomes. Purposeful play occurs when teachers create intentional time and space conducive to exploration and discovery and facilitate opportunities for children to engage in play that supports and encourages learning and development. During purposeful play, teachers engage reciprocally with children in play through language interactions, scaffolding concept development, and enhancing the play experience during teachable moments. Linked to research in the field (Hassinger-Das et al., 2017; Riek, 2014; Weisberg et al., 2016), the goal of purposeful play is to combine a focus on specific learning goals related to standards with the joyfulness of children's autonomy to choose and is influenced by the constructivist theories of Dewey, Montessori, Piaget, and Vygotsky.

Furthermore, the foundational belief of purposeful play is that learning should support the development of the whole child and allows for active manipulation of learning materials to extend children's understandings and enhances their interest in the disciplinary subject matter (Bodrova & Leong, 2007; McDonald, 2018; Mraz et al., 2016; Riek, 2014). Purposeful learning happens when teachers have an understanding of both content and play pedagogy to design learning spaces that are interactive, intentional, investigative, personalized to interests and needs, scaffolded to support discovery and connections to prior learning, and

aligned to academic goals and standards. Instruction is differentiated to the extent possible to meet the needs of unique learners, encourages students to set learning goals and monitor their own progress, and has elements of student choice and autonomy within the structures of the environment established by the teacher. Purposeful play classrooms do not simply provide opportunities for children to play, but also encourage children to challenge themselves; reflect on their own understanding; tap into their interests, needs, or talents to make connections and to develop self-efficacy as learners.

What Does Purposeful Play Look Like?

Although aligned with Next Generation Science Standards (NGSS, 2013: K-LS1-1: Use observations to describe patterns of what plants and animals [including humans] need to survive), purposeful play could look like kindergarten centers where children's language and concept development is expanded after devoting some time to reading books on zoo animals with toy animals to facilitate play. In first grade, purposeful play is seen when the teacher provides a variety of opportunities to measure interesting items using both standard rulers and nonstandard measurement tools, like Unifix cubes or paper clips, as well as different resources to record their data observations, all aligned with Common Core State Standards (CCSS) Math (CCSS, 2010a.MATH.CONTENT.1.MD.A.1: Order three objects by length; compare the lengths of two objects indirectly by using a third object). Or, purposeful play could look like a second-grade teacher encouraging students to follow their interests and pursue self-directed research aligned with CCSS English Language Arts (CCSS, 2010b.ELA.LITERACY.W.2.2: Write informative/explanatory texts in which they introduce a topic, use facts and definitions to develop points, and provide a concluding statement or section). Purposeful play in third grade might be exemplified as hands-on, student-guided play with centers and games that lead to aha moments about economic principles such as scarcity or laws of physical science (NGSS, 2013: 3-PS2-1 Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.).

Although these examples may challenge concepts of free play, classroom opportunities to discover, to self-select a learning focus, to personalize learning goals, and to reach individual achievement targets also align with purposeful play concepts and fulfill the intent of CCSS. In a playful pedagogy classroom, one finds a variety of resources beyond district curriculum frameworks, such as center work with manipulatives, multiple genres, and student choice. Teachers prioritize capitalizing on growing student interests like insects or elections. Purposeful play also includes fine-motor play, such as stringing beads, sorting, and puzzles; pretend play like story retelling, dramatic play, and rules-based games; and visual and performing arts-based play including music composition, drama performance, or creating artwork (Bell, 2014).

Yet, why should teachers allow purposeful play which often takes significantly more time, effort, and commitment than district curriculum frameworks? Experts in various academic disciplines, as well as those more focused on SED, agree that play is a foundational way for young children to engage with the world and others around them to learn and develop conceptual and practical knowledge (Cook et al., 2011; Dore et al., 2015; Han et al., 2010; Massey, 2013; Ramani & Siegler, 2008). Some note that play is imperative in the healthy development of young childrens' cognition, neural plasticity, readiness to work within social norms, and meeting desired learning outcomes (Bartlett, 2011; K. Fisher et al., 2010; Gilbert et al., 2011; Pellis et al., 2014; Weisberg et al., 2013). Last, playful pedagogy is innately more stimulating and engaging. A recent observation of a kindergarten classroom required teachers to follow a scripted curriculum complete with "dog clickers" for reinforcement; the impact of inhibited and devalued thought, choice, and joyful curiosity clearly limited children's growth. The following section outlines the strong rationale for purposeful play including recent neuroscientific findings, connections to poverty-related learning challenges, and increasing school readiness factors as well as academic achievement once in school.

Why Play in Primary Grades?

> Children need the freedom and time to play. Play is not a luxury. Play is a necessity. (Jamison, 2004)

Recent Neuroscientific Findings

For the past decade, researchers have been increasingly focused on EF and SR as an essential underpinning for success in formal K–12 schooling. Indeed, "coordinating multiple, and sometimes competing, demands on cognitive activity, is one of the central hallmarks of readiness for the seismic shift in complexity of the learning tasks that will occur in early elementary school" (Moreno et al., 2017, p. 144). Researchers in neuroeducation identify three main types of brain function that act as "the air traffic control system" of the brain (Center on the Developing Child at Harvard University, 2011, 2017). These primarily include working memory, cognitive flexibility, and inhibitory control, but also subsume decision-making, delaying gratification, planning, goal setting, rule following, and problem-solving. Although EF can be negatively affected by stressful environments and a lack of quality interactions with caring adults (Lally & Mangione, 2017; Shonkoff, 2017), "growth-promoting environments" help EF develop (Center on the Developing Child at Harvard University, 2017; Pakulak

et al., 2017). Predictable routines, familiar procedures, adults who model pro-social-emotional behaviors and stress management techniques, gross motor development and exercise, creative play opportunities, and scaffolding with a gradual increase in complexity and independence are all components of EF-friendly classrooms (Allee-Herndon & Roberts, 2018). Much of what supports EF growth can be found in constructivist, discovery-based classrooms aligned with the respected theories of Montessori, Piaget, or Vygotsky (Allee-Herndon & Roberts, 2018).

School readiness is hierarchical and cumulative (i.e., learning to read without sufficient language development and vocabulary). Identifying readiness and later achievement, however, can be difficult, both in the definition of the construct and assessment of readiness which frequently requires one-on-one evaluation. In addition, best practice indicates young children be assessed not only on cognitive or academic domains but also on SED, physical well-being, gross-motor development, and language use to determine their readiness for school (Barnett et al., 2017; Zill & West, 2001). Any assessment of academic readiness skills and knowledge must include representation of foundational literacy skills such as alphabet knowledge, phonemic awareness, writing (National Early Literacy Panel, 2008), and numeracy/math skills such as one-to-one correspondence, written numerals, quantity, and greater/less than (Zill & West, 2001). To acquire these skills, however, children must possess the essential foundational social-emotional and cognitive building blocks for readiness.

Research suggests that foundational skill mastery prior to kindergarten leads to increased chances that children will learn to read, write, and calculate sooner and more successfully (Zill & West, 2001), yet an overwhelming number of children, particularly those living in poverty, still enter kindergarten lacking these foundational skills. The Early Childhood Longitudinal Study, Kindergarten Class of 1998-99 (ECLS-K) data indicate that risk factors (i.e., poverty, single-parent household, mother without a high school education, food stamps, or welfare payments) are correlated with decreased developmental outcomes, general knowledge, literacy, and mathematical skills in kindergarteners. Nearly half (46%) of all kindergarteners have at least one family risk factor (Zill & West, 2001). Racial and ethnic minority, as well as English Language Learner (ELL), children are also more likely to be at risk. In large cities, the number of at risk children increases to 66% significantly affecting kindergarten readiness (Zill & West, 2001).

Connections to Poverty-Related Learning Challenges

Children living in poverty do not simply have a lack of financial resources with which to contend (Ackerman et al., 2004a; Blair & Raver, 2016; Engle & Black, 2008; Raver et al., 2012). The stressors involved in living in poverty can also affect SED in young children (Ackerman et al., 2004a, 2004b; Bernhard et al., 2008; Blair & Raver, 2015, 2016; Raver et al., 2012). Persistent poverty conditions are also known to impact the home learning and verbal environment (Fernald et al., 2012; Leffel & Suskind, 2013). Chronically impoverished households contribute to children's decreased language abilities (Ferguson et al., 2007; Han et al., 2010; Whitehurst & Lonigan, 1998), problem-solving capabilities (Burchinal et al., 2002; Ferguson et al., 2007), and limited cognitive growth (Brooks-Gunn & Duncan, 1997; Ferguson et al., 2007; Raver & Blair, 2016). Children growing up in poverty demonstrate significantly reduced vocabularies and substantial difficulties with foundational literacy skills, comprehension, and concepts about print (Ackerman et al., 2004a; Apthorp et al., 2012; Bernhard et al., 2008; Huang & Invernizzi, 2012; Sood & Jitendra, 2013).

In the last two decades, researchers explored the concept of EF related to young children's readiness for school, especially in poverty (Blair, 2016). Recently, researchers are investigating the physiological impacts of poverty on the developing brain with burgeoning evidence that children living in poverty have reduced gray matter and cortical surface area which contribute to 15% to 20% of the income-related achievement gap (Blair & Raver, 2016; Blair et al., 2011). Strongly correlated with the extent of poverty, findings noted that the effects of poverty on developing brains can been seen as early as infancy (Blair & Raver, 2016).

Children living in poverty have lower cognitive performance, increased behavioral issues, and historically underperform their peers academically on several important metrics like socioeconomic status, ethnicity, primary language, academic performance, and exceptional education status (Rathbun & West, 2004; West et al., 2000, 2001; Zill & West, 2001). Children living in low-income homes experience developmental delays that encompass interdependent skills: gross motor, sensory perception, SED, language development, and cognitive development (Blair & Raver, 2015; Brown & Low, 2008; Engle & Black, 2008). These impairments have a significant negative impact on readiness for kindergarten, which correlates with later school difficulties (Rathbun & West, 2004). Indeed, the gap frequently widens rather than diminishes for those who begin behind their peers (Blair & Raver, 2015; Engle & Black, 2008).

Increasing School Readiness and Academic Achievement

School readiness is highly predictive of later school success, even when controlling for other variables such as parental education and family structure, and children in poverty often lack sufficient preschool ability (Duncan et al., 1998). Being ready to learn upon entry to kindergarten is not solely an

academic matter of having number sense, being able to count with one-to-one correspondence to 20, being able to name letters, and having some letter-sound awareness (Blair & Raver, 2015; Engle & Black, 2008; Huang & Invernizzi, 2012). Instead, the best mix is one of academic readiness with social-emotional and self-regulatory readiness:

> Children are ready to start school when they have reached a point in development at which they are sufficiently able to manage stimulation and attention in ways that begin to allow for the regulation of emotion and attention that enables sustained engagement with learning activities. (Blair & Raver, 2015, p. 715)

Poverty in childhood is associated with diminished academic performance in classrooms and on high-stakes assessments and additional risk factors that negatively affect school performance. These include increased school absences and truancy, increased disciplinary referrals and suspensions, overrepresentation in exceptional education programs, higher frequencies of behaviors not conducive to learning, and greater retention and dropout rates (Child Trends Data Bank, 2016; Duncan et al., 1998; Engle & Black, 2008). These negative outcomes lead to reduced instructional time further widening an already alarming academic achievement gap.

Although quality preschool that includes purposeful play can contribute dramatically to improved language, literacy, and mathematics competencies as well as improved responses to learning in kindergarten and primary grades, these effects often fade by third grade (Pianta et al., 2009; Yoshikawa et al., 2013). One argument, however, to prevent the fade-out effect of high-quality preschool interventions for young children (Pianta et al., 2009; Yoshikawa et al., 2013), especially young children at risk, is that primary grades are the optimal place for a purposeful play pedagogy that better connects preschool to K–12. More than 10 million children who live below the poverty threshold attend public pre-K–12 schools, and over 1 million of these children attend public prekindergarten and kindergarten (National Center for Children in Poverty, 2017). Poverty poses the single greatest threat to children's well-being and educational equity, especially when experienced in early childhood. All our students, but especially our most vulnerable ones, deserve high-quality and efficacious learning environments to prepare students for global competitiveness, educational excellence, and equity of opportunity (Civic Impulse, 2018).

As the first year of formal and comprehensive schooling for most children, kindergarten is often a time of tremendous growth and change for children (West et al., 2001) across multiple domains. Historically, kindergarten has served as a unique and special bridge between early childhood education (ECE) and K–12 (National Association for the Education of Young Children [NAEYC], 2005, 2009) where children learn SED and new academic content. Ideally, attention to robust content, learning progressions, quality systematic assessment, and effective curriculum and teaching must be incorporated while also scaffolding and differentiating learning in a prosocial environment to support each student's unique needs. The knowledge and skills developed in the primary grades lay the foundation for later academic achievement (Rathbun & West, 2004), but the radically different instructional and academic expectations of today demand solutions.

Striking a Balance

> Do not keep children to their studies by compulsion but by play. (Plato, 427–347 BCE)

State standards and assessments, district expectations and curricula, building-level pressures, parent concerns, trickle-down stress from teachers in higher grades, individual student needs, and professional values and philosophies all demand to be prioritized with employment and school grades and funding at stake. Many assert that lockstep adherence to a scripted, vague, and impersonal curriculum, solely aimed at boosting scores, rather than inclusive definitions of growth, is equally damaging (Boote, 2006; Copple et al., 2007; Goldstein, 2007a, 2007b, 2008a, 2008b; Graue, 2008; Hatch, 2002; NAEYC, 2009). Because many policymakers distrust teacher autonomy, primary teachers are caught in a struggle between adhering to district curriculum frameworks and measures of accountability and developmentally appropriate practice (DAP) supporting play. Teachers' competing demands often challenge them to find approaches that take into consideration others' values and expectations, accountability, autonomy, and differentiated instruction (Boote, 2006; Copple et al., 2007; Goldstein, 2007a, 2007b, 2008a, 2008b; Graue, 2008; Hatch, 2002; NAEYC, 2009).

Many young children, especially under-resourced children or otherwise vulnerable children, do not spend their time out of school engaging in high-quality play. Because high-level, purposeful play affords so many social-emotional and cognitive benefits, DAP purports that primary classrooms provide play-based learning opportunities supported by skilled teachers (NAEYC, 2005, 2009). Similarly, the School-Age Care Environmental Rating Scale (SACERS; Harms et al., 2013) focuses on interactions, environment, and purposeful play activities, espousing and leveraging an imperative DAP approach. Using tools like the SACERS and resources to support DAP, primary grade teachers, along with their coaches and administrators, can strengthen the use of purposeful play to enhance children's outcomes.

Based on the research literature and the authors' decades of experience, however, the majority of kindergarten and

primary teachers, especially those in high-need, low-achieving schools, are ordered to enact a scripted curriculum and are not allowed the professional discretion to make informed decisions that deliberately adjust or veer away from the mandated curriculum. This lack of autonomy must be addressed as many of these teachers have knowledge of DAP, child development, and curriculum and instruction to effectively analyze problems of practice, reflect on their own philosophies and pedagogy, and explore adjustments or alternatives. The long-standing and highly respected ECE practice of providing DAP has been usurped by policymakers unaware that young children need access to enriching, intensive learning experiences that include purposeful play at an early age to moderate the achievement disparities often associated with income, ethnicity, and language differences. In their revised DAP position statement, NAEYC (2009) advocates for a blending of both priorities, with kindergarten and primary grades serving as bridges toward high academic achievement and SED. A comprehensive, effective primary curriculum must attend to both academic and social-emotional competencies, scaffolding and differentiating learning in a prosocial environment with an attention to robust content, learning progressions, quality systematic assessment, and effective curriculum and teaching. Future studies should focus not only on the current demanding standards culture, but also on factors that ignore purposeful play as a means to advance cognition, while inadvertently reinforcing inequities across the span of grade levels.

Conclusion

> Play is our brain's favorite way of learning. (Ackerman, 2000)

Despite every effort since NCLB (2002), students have not experienced the prolific gains intended by the increased accountability of assessment culture of our educational system. On international math, reading, and science assessments, for example, the United States continues to lag behind many other industrial nations (DeSilver, 2017; Morgan, 2018). The gains in international reading, math, and science scores since 2002 (DeSilver, 2017; Morgan, 2018) are not impressive considering the dramatic shifts away from play in kindergarten and primary grades (Bassok et al., 2016). Since the 1990s, the way children learn in primary grades has changed almost as dramatically as what they are expected to learn. However, this focus on rigorous academic standards and utilizing measures of accountability need not be mutually exclusive to developmentally appropriate instruction with a focus on hands-on, language-rich, discovery-focused, and purposeful play.

Indeed, the focus of CCSS on college and career readiness have ushered a push toward direct instruction with skills taught in isolation using worksheets, textbooks, and computer-based daily instruction persisting. Despite the confounding lack of academic achievement, students, especially students at risk, will be highly unlikely to achieve the desired cognitive, social-emotional, and academic outcomes. Seemingly counterintuitive, yet naturally, college and career skills are enhanced by purposeful play, which as indicated involves EF, SR, SED, mindfulness, metacognition, empathy, and positive approaches to learning in addition to retention of content knowledge. The justification for advocating a change to purposeful play aligned with standards is, in part, based on the lack of inspiring academic gains in an increasingly pressure-filled culture, but also based on what is being learned about stress, resilience, and achievement. Yet, integrating purposeful play, despite resistance from many who feel the need to double down on didactic instructional approaches and assessments, can support children in critical SED, SR, EF, and academic gains.

Schools are not seeing the student gains sought by education reforms. Researchers and practitioners know that purposeful play is aligned with recent neuroeducation findings about the effects of poverty on developing minds and can reduce stress, build critical social-emotional skills, and better support our most fragile learners academically (i.e., Armin et al., 2017; Barros et al., 2009; Blom et al., 2011; Cremin et al., 2015; Fisher, 1992; Fisher et al., 2010; Hassinger-Das et al., 2016; James-Burdumy et al., 2013; Jarrett, 2002; Lillard et al., 2012; Massey et al., 2017; McArdle et al., 2013; Mullender-Wijnsma et al., 2015; Nolan et al., 2014; Pellegrini, 2013; Ranz-Smith, 2007; Russo, 2013; Sandberg & Heden, 2011; White, 2013). Early childhood (EC) educators must demand a shift to purposeful play based on recent neuroscientific findings, the connections to poverty-linked deficits, and play's promise to boost school readiness and academic achievement. The combination of children's developmental needs, teachers' goals for student growth and retention, and suboptimal achievement outcomes has strong implications for practitioners, researchers, and policymakers to look closer at the emerging science behind stress, resilience, empathy, and well-being as they relate the pedagogy of play.

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