Educating the Whole Learner

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Mobilizing whole child advocates behind the neuroscience of learning and development.

We'll state the obvious: The last two decades of education reform, which resulted in a near single-minded fixation on test scores as the most dominant measure of student success, are *over*. A quick tour of education policy shows how we have arrived at a place where we now increasingly appreciate the importance of whole child learning approaches. In 1983, the federal report *A Nation at Risk* ushered in a new accountability movement that led to the No Child Left Behind Act in 2001 and the Common Core State Standards in 2010. Accountability reform efforts saw their final chapter in 2015 with the passage of the Every Student Succeeds Act, as power shifted back to states and communities (Schoales, 2019).

At their core, the foundational elements of NCLB—national standards and accountability priorities—assumed that the solution to improving student performance and closing gaps was to focus on *what* children should learn. Thus, test scores were intended to measure the amount of information taught, minus the amount not learned or learned and forgotten. Even the Common Core initiative was fundamentally about what students should know and be able to do. As we come out of this reform era, however, we are seeing gathering momentum behind more holistic approaches to education that fundamentally shift the focus from measuring *what* is learned to better understanding the process of *how* students learn.

The groundswell of support for educating the whole learner has produced many approaches that come at this issue from different angles—social and emotional learning, deeper learning, character education, growth mindset, mindfulness, project-based learning, 21st century skills, school climate, grit, and whole child education. Yes, we still have standards for what students should know and be able to do. We will always expect 4th graders to know how to use the four operations to solve word problems and 8th graders to know United States history from the colonies to the Civil War. But across these whole learner initiatives is a new commitment to developmentally based approaches to teaching and learning. These approaches share an emphasis on *how* students learn—how their full engagement with teachers, peers, and classroom materials contributes to a gradual process of growth, development, and learning.

What is underappreciated by the advocates of all these approaches is how greatly the mounting evidence from the field of neuroscience supports the push for developmentally based teaching and learning. In fact, the emerging brain science is serving as the *connective tissue* across these developmental perspectives. When teachers support students to pay

attention in class; manage strong emotions of frustration and anger; care for others to create a sense of classroom community; develop such character traits as honesty, integrity or responsibility; or interpret challenging experiences as an opportunity to persist, students are working on skills that are rooted in neuroscience.

United They Stand

This explosion of research in neuroscience has now advanced to the point where it is time to take a unified approach to translating knowledge to practice in schools and classrooms. If we really want to transform public education from its historical fixation on students as "receptacles" to be filled with endless content, we must focus on commonalities across the field of whole child learning. While whole child approaches may stem from different theoretical perspectives, they are united by their rejection of the *false choice* between academic success and student development. Neuroscience has the potential to bring these kindred fields of developmentally based learning together as a mobilizing force behind a fundamental change in our education system. How whole child advocates help educators align and understand the connections across these fields will be critical to whether we make progress on closing gaps and advancing education outcomes.

Four Key Findings

Supporters of whole child learning can mobilize improvement in educational practice by considering a couple key questions: What does the latest research on the brain and learning really say—or not say? and What do we know today that we did not know 25 years ago? The research can be summarized into four key findings.

1. The brain is malleable.

Recent evidence shows that brain development is open to change, growth, and intervention over time. The impact experiences have on malleability is greater than scientists originally realized (Cantor et al., 2018). A child's social and physical context can have an enormous influence on development. Repeatedly, we hear about the adverse effects of poverty, prenatal drug exposure, and environmental toxins on the brain. Yet even in the presence of these environmental hazards, neuroscience points to the brain's malleability and the potential for growth, change, and resilience if children experience enriched environments where they are exposed to rich language and learning materials, feel safe, have a sense of belonging, and experience healthy relationships with adults and peers.

What does this mean for teaching and learning? First, the brain science tells us that *all* children have the ability to learn. How they do this is highly individualistic and dependent on their immediate experiences, relationships, and environments. Learning and development are neither uniform nor linear and each student has their own profile of strengths and vulnerabilities (Osher et al., 2018). Second, learning environments matter for all children, but especially for those children who experience poverty and other challenges outside the classroom. Among children from low-income families, nurture matters more than nature in predicting IQ, whereas the opposite is true in children from families with higher socioeconomic status (Turkheimer et al., 2003).

Teaching practices founded in neuroscience, however, should not be viewed as a remediation strategy for only those with learning differences, the underserved, or the underperforming. Similarly, these practices should not be available to only the most advantaged students (Immordino-Yang, Darling-Hammond, & Krone, 2018). What is most clear from the evidence is that teaching and learning practices that are based on neuroscience are the most effective strategy for *all* students' learning, regardless of background.

2. There are sensitive periods in brain development that align with opportunities for learning in early childhood and adolescence.

A growing body of scientific knowledge shows that experience and environment interact with genetics to shape our brains. This science supports the views of developmental psychologists who have long pointed to the importance of sensitive periods for development. By definition, a "sensitive period" refers to a moment in a child's development when they are increasingly prone to learn certain skills or behaviors. Research in the early 1990s identified the neonatal period from infancy to toddlerhood as the first sensitive period (Institute of Medicine and National Research Council, 2000). For example, infants are born with the capacity to learn many different languages. Early language stimulation strengthens neural connections specific to that language and other, unused connections are simply pruned away.

Recent research now presents adolescence as a second sensitive period of development that influences children's brains (NASEM, 2019; UN Children's Fund, 2011). During adolescence, for instance, youth are particularly attuned to reward and aware of social hierarchies. As a result, adolescents tend to explore and take risks, and the results of these risks—both positive and negative—have tremendous long-lasting impact (NASEM, 2019). A central theme of all this research highlights adolescence as an age of opportunity with the potential for the development of resilient responses to earlier trauma and adversity.

What does this mean for teaching and learning? The research again points to the impact of environments on brain development. During early childhood, investments in parent education and teacher professional development to create higher quality home and learning settings can offset the effects of deficits and adversity. Similarly, during adolescence, safe and secure learning settings and the presence of adults who *students perceive* as people with their best interests in mind are essential to healthy development and optimal learning and can even counteract the effects of trauma (NASEM, 2019; UN Children's Fund, 2011).

3. The brain is integrated across developmental domains.

Years ago, when educators learned about developmental domains, they learned about the milestones of cognitive development, the benchmarks of physical development, the signs of social development, and the markers of emotional development. Now we realize the integration among these various domains of development and how shifts in one domain connect to changes in another domain. Recent research in neuroscience illustrates that learning is a social exercise (Kuhl, 2010) that can be enhanced or impaired by students' emotional experiences (Immordino-Yang et al., 2015). The intense interconnection of domains in learning and development impacts the discrete development of each domain and their influence on one another. In other words, emotional distress can interfere with cognitive processing. In circumstances where environments produce consistently high levels of emotional distress or social strife, cognitive delays will transpire.

What does this mean for teaching and learning? Neuroscience teaches us that emotionally safe, relationship-based, and cognitively stimulating environments contribute to brain development (Immordino-Yang et al., 2018). Learning environments that privilege relationships can offset stress and trauma (Center on the Developing Child at Harvard University, 2016), and similarly, when students consistently perceive support and safety, cognitive growth can occur. When educators construct learning environments with the understanding that children's cognitive, emotional, and social domains are integrated and mutually reinforcing, children are better equipped to learn and make greater academic progress.

4. Classroom and school environments matter.

The three findings illustrated above ultimately lead to one key message for educators: *classroom and school environments matter for brain development*. We can embrace the role that learning settings play in students' development and construct them intentionally and meaningfully or ignore the important role of these settings and do this work poorly by default. If we are not intentional about designing teaching and learning

environments that reflect *how* children learn, we risk creating learning settings that harm children's development.

Given the brain's malleability, all children—especially those who are underserved—need stimulating, caring environments from birth through adulthood. We need to infuse a growth mindset in both teachers and students—a belief that intelligence can grow with hard work, effective strategies, and support from others. To fully realize the potential for brain development during sensitive periods of early childhood and adolescence, we need to continue our momentum to improve early childhood settings and galvanize new efforts to redesign middle school to match youth's developmental needs. Finally, we need to construct learning environments that focus on the whole child by recognizing that the brain is integrated across the social, emotional, and cognitive developmental domains. By integrating—rather than separating—young people's social, emotional, and cognitive development, we can position all students to have more success academically, and we can improve their overall well-being (Cunha & Heckman, 2008; Durlak et al., 2011; Jones & Doolittle, 2017).

Project-based learning (PBL) offers one promising way to integrate instruction across developmental domains (Condliffe et al., 2017). Adopting PBL approaches that align with academic standards allows students to explore real-world problems, identify solutions, and then implement those solutions. In doing so, PBL produces deeper learning and leverages students' social and emotional skills toward academic learning.

What does this look like? We recently interviewed a team of 4th-grade teachers who used a PBL curriculum (Connect Science) to teach a Next Generation Science Standards-aligned lesson on circuits, electricity, and energy sources. In learning about renewable and nonrenewable resources, their students discovered a problem: the overreliance on nonrenewable resources as our primary source of electricity. Each class identified actions they could take to make a difference in their community. In one class, a teacher blended science, social-emotional learning, math and language arts standards (including the use of informational texts and interpretation of charts, graphs, and diagrams) as students planned an "energy carnival" to educate families and peers about sources of electricity and ways of reducing electricity use. The activities sparked excitement about learning, boosted the relevance of science, and gave students a chance to apply skills across cognitive, social, and emotional domains.

How do we support adults in leading this kind of work? We know that teachers and principals are pivotal to creating the learning settings that all children need and deserve. Supporting these educators so that they can support students is essential, especially in high-needs, under-resourced schools. A growing body of research suggests mindfulness training improves teacher well-being, reduces stress and burnout, and improves efficacy (Jennings et al., 2013). Professional learning communities (DuFour, 2004), effective leadership involving respect and positive regard for teachers, and opportunities for teacher

autonomy can also contribute to relational trust and improved work experiences among the adults in schools (Bryk & Schneider, 2003).

Research to Practice

Educators can make the most of these mounting research findings by recognizing that supporting the whole learner is rooted in the best developmental and neurological science. As the architects and facilitators of student learning, teachers and school leaders are ultimately responsible for how neuroscience is translated to practice. This is no small task. Fortunately, neuroscience now confirms what many educators know intuitively from their daily practice. That is, whole child learning works because children and youth thrive in safe, supportive environments that create opportunities for students' social, emotional, and academic development. Children learn best when the content feels relevant to them and they feel a sense of purpose and agency in their work.

The burden of translation, however, cannot fall solely to educators. For neuroscience to be applied effectively, educators must have access to knowledge so they know why some practices support students' development effectively while others don't. To achieve this goal, the burden of research translation must shift from educators to researchers. Yes, we need to bolster educators' skills and knowledge so that they have sufficient expertise to appreciate and assimilate the new neuroscientific knowledge as it emerges. But even more important, we need neuroscience researchers who are well-versed in teaching practices and education to translate new findings into practice with clear descriptions of what works in schools and classrooms.

Finally, advocates of developmentally based, whole child approaches should see the neuroscience as the connective tissue across their kindred approaches. New knowledge in neuroscience on *how* children learn creates an opportunity to join together and mobilize. Only by uniting to form a shared understanding will we be able to give educators the tools they need to differentiate between effective versus ineffective adaptions of the brain science to their daily practices.

It is time to shift from focusing on differences in whole child approaches to emphasizing commonalities. The whole child learning community needs to come together *en masse* with the neuroscience as its common foundation. This will bring much needed clarity for educators who intuitively know that we must support the whole learner and are making it happen in ways that fit their unique circumstances. It is time to gather this momentum into a movement with the potential to improve the lives and performance of students across the country.

Reflect & Discuss

➛ Did any of the four key findings, from the latest research on the brain and learning, surprise you? Why or why not?

➛ As the authors emphasize, "classroom and school environments matter for brain development." How could you optimize your learning environment to better meet students' neurological needs?

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