WHO TOOK THE PROFESSION OUT OF PROFESSIONAL DEVELOPMENT?

By Melissa Hughes

With all the rhetoric about what's wrong with education today and how to fix it, there are no shortage of opinions and perspectives about raising the test scores that demonstrate student achievement. From assessment and accountability to standards and research-based instructional strategies, reformers are debating long and hard about what our teachers should be doing differently to improve student achievement.

The shift to Common Core, STEM, Next Generation Science Standards, technology, and 21st century learning all require a shift in instruction. The notions of building, tinkering, and experimentation that were once classified as "play," have evolved into the sound pedagogy of experiential learning. While teachers are urged to foster discovery, collaboration, reflection and exploration among their students, we have yet to insist that professional development be based upon the same principles of learning.

In fact, "The Mirage," a 2015 report examining the $18 billion professional development industry in education, described current professional development (PD) initiatives as "abysmal," "ineffective" and "a failure." The results of that study delivered a searing assessment of the effect that many of the current PD programs have on teacher quality, classroom instruction and student achievement. In addition, a growing body of brain-based research sheds new light on cognitive function. The last two decades of neuroscience have uncovered valuable findings about what impacts our ability to learn, remember and apply new information. As educators in the business of teaching and learning, it seems logical to apply these findings to the way we teach the very people who teach our children. And yet, the science of learning has yet to become a fundamental element of teacher training.

The Neuroscience of Learning

Until recently, many psychologists identified creativity and intelligence as fixed traits. We now know differently. The capacity to learn, solve problems, think critically, and be creative is hardwired into our brains. We either tap into it and nurture it, or we don't. This doesn't end when we reach adulthood. Neuroplasticity enables us to continually grow and physically change the brain.

The human brain has more than 100 billion cells called neurons. Whenever we see, read, hear, talk about or process information, long fibers called dendrites grow out of the neurons. The more we learn, the more dendrites we grow, the more connections we make, the more we grow our capacity to learn more. Regardless of whether you're seven or 70, this neurological activity occurs through sequential stages of learning. In simplest terms, these stages of learning are:

Why wouldn't we apply scientific principles of learning to teach the very people charged with improving learning?

- **Motivation — show interest**
- **Exploration — ask questions**
- **Practice — trial and error**
- **Skill — demonstrate success**
- **Refine — reflect, apply, improve**
- **Mastery — teach and challenge others**

It is that progression from the practice stage to the mastery stage that enables us to build more dendrites and stronger connections. Think of the motivation stage as the Charlie Brown tree, and the mastery stage as the Rockefeller Center tree.

The expectation is that, through the implementation of these new instructional strategies, our teachers will enable students to move from motivation to mastery. Ironically, many professional development experiences fail to incorporate the ongoing dialogue, active learning, and collaboration necessary for teachers to navigate to mastery.

Whole-Brain Teaching and Learning

While we used to believe that individuals are either right-brain dominant or left-brain dominant, we now know that is an over simplification. Research confirms that there are specific areas in the brain that manage language, numbers, logic, planning, music, speech, etc. Right brain or left brain dominance is dependent upon the task, not the person. Over the last two decades, scientists have explored the impact of whole-brain activity on learning. For example, brain scans show that physical movement incorporated with cognitive tasks engage more regions of the brain and thereby enable deeper cognition, enhanced memory, application and synthesis of concepts.

Furthermore, there is a wealth of research to support the "learning pyramid." We know that adding visuals to new information substantially increases understanding and recall. When we combine visual aids with opportunities for students to hear, discuss, and demonstrate their learning by doing, we increase retention and cognition significantly. It is this experiential learning that engages more parts of the brain, creates more dendrites

and builds stronger synaptic connections in the brain.

The overwhelming effectiveness of experiential learning has fueled a movement toward whole-brain instruction, which emphasizes active learning that engages both hemispheres of the brain. To truly understand whole-brain instruction, we need to examine one of the greatest minds of our time. As recently as 2013, neuroscientists discovered one of the fundamental differences between Albert Einstein's brain and the average brain. The corpus callosum is the bundle of nerves that connects the two hemispheres and facilitates the communication between them. It turns out that Einstein's corpus callosum was freakishly large, enabling a superhighway of connectivity. His extraordinary cognitive ability to envision and understand complex abstract scientific and mathematical principles was largely due to this enhanced communication between the two hemispheres.

How do we apply that to learning? The more we can incorporate left brain dominant tasks with right brain dominant tasks into our instruction, the more parts of the brain students will engage for deeper cognition and retention. Likewise, the more we can incorporate whole-brain experiences into professional development, the more likely our teachers will be able to understand and transfer those experiences to their own classroom instruction.

Developing Effective Teacher Training

We don't tell students how to ride a bike, play the piano or paint a picture. We give them the tools to do it and then facilitate the experience. Just as students are much more successful when they are immersed in the experience of learning, teachers are too. We can tell them about an instructional strategy that works, or we can enable them to experience that strategy. We can give them opportunities for trial and error, ongoing dialogue, collaboration, reflection and support. Or, we can provide a PD day, as required, and let them go back to the isolation of their classrooms expecting them to implement it.

How effective would it be for our students if we presented them with the necessary information and then walked away to let them figure it out from there?

Can one truly improve instruction without a basic understanding of how the brain works?

Yet, that is the very model of the one-and-done sessions that fulfill so many PD requirements today.

Education is practical neuroscience. A basic understanding of the human brain won't make you a neuroscientist, but it can make our teachers more effective. Schools need teachers who do more than simply implement new strategies. They need teachers who understand the science of active learning and the cognitive benefits of collaboration, reflection, support and collegiality. They need teachers who inspire a culture of learning at all levels of the organization.

We're in the business of teaching and learning. Somewhere along the way, we've been so focused on improving instruction that we've lost sight of providing our teachers with meaningful learning experiences. The kind of professional development that inspires meaningful change in the way teachers teach is not out of the realm of possibility. But it does require an understanding of how the brain learns and embracing teachers as learners — collaborative, collegial, reflective, interactive learners.

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