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Emmanuel Felton


Stephen Sawchuk

From changes to teacher evaluation to the inner workings of the teachers' unions to new developments in teacher preparation, veteran reporter Stephen Sawchuk and contributing writer Emmanuel Felton keep you up to date on the biggest issues shaping the teaching profession today.

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Are Teachers Being Taught Bad Science?

By Emmanuel Felton on May 12, 2016 4:50 PM

Here's a quick quiz. Rate the following statements on a scale from one to five, with one meaning you totally disagree and five meaning you wholeheartedly agree:

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- Beginners and experts essentially think in the same way.
- Most people are either left-brained or right-brained.
- Students learn more when information is tailored to their unique learning styles.

Cognitive psychologists and neuroscientists would resoundingly give all three of those claims a rating of one.

Did you bomb that test? Here's a small piece of solace—many professional educators wouldn't pass either, said Benjamin Riley, the founder and executive director of Deans for Impact, a coalition of education school directors looking to transform how teachers are prepared.

Riley spoke last week on an Education Writers Association panel in Boston that examined ways to teach educators the science of how students learn. He was joined by Nora Newcombe, who directs a federally-funded Science of Learning Center at Temple University and Mayme Hostetter, the dean of the Relay Graduate School of Education. Relay is a teacher preparation program founded in 2011 by three high-achieving charter school networks that were concerned about the quality of teachers coming out of traditional degree programs.

Many education experts and alumni of traditional teacher-preparation institutions have long panned such programs for doing a poor job of readying future teachers for the classroom. Under President Obama, the U.S. Department of Education has focused intensively on improving the quality of the nation's teacher-preparation programs, including several efforts to require states to rate schools of education and use those ratings to shift funds away from poor performers and into effective programs.

During the May 2 discussion, Riley, Newcombe, and Hostetter agreed that one of the keys to refining teacher-preparation programs is improving how they teach teachers the science of learning. Education schools need to get better at both getting scientific research into the hands of future educators and providing those teachers with guidance for turning that research into practice, they said.

"My background is not in education, it's in cognitive development and cognitive science," said Newcombe, the Temple University scholar. "When my kids got to elementary school, I quickly became aware that what their teachers were saying didn't match what I knew about cognitive development."

She added: "There is a crisis in this country. Teachers are being taught outmoded and often incorrect information."

Much of that inaccurate knowledge has become gospel in schools and society writ large, Newcombe said. For example, she contended that while people have strong intuitions about how they learn best, research has unequivocally shown that there are no benefits to trying to match teaching styles to learning styles. She's also found that teachers don't tend to appreciate the value of having their students work through wrong answers in addition to correct ones.

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Research also shows that using analogies in teaching pays big dividends, Newcombe said, and that teachers tend to underestimate the 'teachability' of what's known as spatial thinking. (This concept refers to the ability to visualize and work with imagined objects, a skill that is often linked to success in science, technology, engineering, and mathematics careers. Tests to measure spatial thinking include completing geometric patterns, imagining the full motion of a mechanical tool, and viewing a two-dimensional diagram and predicting how it would look like assembled in a three-dimensional space, such as assembling a flat box with added features).

Even at education schools with courses on cognitive development, students are often left wanting, said Riley, the Deans for Impact founder.

"Say you take a course called educational psychology, maybe it's good, maybe it sucks," he said. "Usually you learn some things about cognitive science, but you never get to make the connection to how that should inform your practice, what instructional moves you should and shouldn't make."

Hostetter of the Relay graduate school said teacher-preparation programs need four elements in place to help future educators make the leap from theory to teaching.

"First you need research that is basic and has been tried and tested in classrooms," she said. "You need faculty that actually know the basic science and how to implement it. You need materials like a video to reinforce how it would happen in a real middle school math classroom. And lastly, you need structures that let teachers practice and get feedback in a low-stakes setting."

Hostetter argued that preparation programs need to be the place where future teachers learn the ins and outs of, say, how to use analogies successfully in a biology class. At the same time, she conceded that upstart programs like hers haven't completely solved the problem either. While many traditional schools of education have been criticized for being too theoretical, Relay has the opposite problem—most of her instructors have long track records in the classroom, but lack the deep well of research knowledge vested in the faculty of education schools.The problem doesn't stop when teachers graduate from schools of education.

"There is a more immediate threat," said Newcombe. "The quality of the professional development teachers are receiving is a really, really big deal. There is no 'Good Housekeeping' system, there's no way to get the word out on who's an impostor. What's going on in some of those sessions is far worse than what's happening in schools of education."