True Teaching Expertise

The Weaving Together of Theory and Practice

By Bryan Mascio

How do we strengthen the teaching profession? This question weighs on many educators, researchers, politicians, and parents. Everyone seems to have his or her own solutions to offer. The public discourse around teaching often feels very negative; it doesn't clearly define teaching expertise, but it does reflect a very clear belief that many of us teachers just don't have it. I'm not sure where this narrative of incompetence comes from, but I do know that we can't fight it by simply saying, "No, we're not."

Bryan Mascio taught for 12 years in New Hampshire, where he primarily worked with public school students who had been unsuccessful in traditional school settings. He is currently a doctoral candidate at the Harvard Graduate School of Education, where he researches the cognitive aspects of teaching and works with schools to support teacher and student relationships. Parts of this article appeared in Mascio's blog entry "Who Are (and Should Be) the Teaching Experts?" for the Albert Shanker Institute on November 19, 2015, available at www.shankerinstitute.org/blog/who-are-and-should-be-teaching-experts.

ILLUSTRATIONS BY LIZA FLORES

Many educators agree that to improve the profession, classroom teachers must be consulted and involved. To that end, we need to show those outside the classroom what teaching expertise looks like and where it resides: with actual classroom teachers.

When I hear respected public figures call for a focus on the "nuts and bolts" of teaching—in contrast to an emphasis on educational philosophy and theories of development—I fear what the repercussions might be. This recommendation is a common message, promoted both by those in academic research and by fast-tracked teacher preparation programs. It implicitly sees academics and researchers as the primary generators and holders of expertise, and asks them to guide teachers and offer them insights. By mistaking—and at times even privileging—certain kinds of expertise, this view may inadvertently lay a path toward regarding teachers as technicians rather than the true professionals they are.

Uniting Research and Practice

In medicine, the fields of biochemistry, microbiology, genetics, and bioengineering, to name a few, contribute invaluable research

used by doctors and hospitals to improve patient care. Researchers in these sciences are respected for their expertise and typically have far greater content knowledge than the average physician, but neither society nor the medical field confuses the role of medical researcher with that of doctor.

Research results in knowledge of average effects, common side effects, and how diseases typically present. Doctors use that knowledge and combine it with an understanding of clinical practice, the complex systems involved with human health, and details of their individual patient's past and present health to create a clinical expertise. This is what makes them medical experts.

Doctors don't ignore the research; they are keenly aware of what symptoms suggest pneumonia, for instance, and which antibiotics are most effective to treat it. But doctors also know that other illnesses could cause many similar symptoms; certain facts about an individual may make other illnesses more likely, so knowing an individual's medical history is just as important. And if you are allergic to an antibiotic, it doesn't matter how "effective" it is. Doctors don't treat the *average*, the *common*, or the *typical* patient—they treat *you*, and that's exactly what you want and expect them to do.

In education, psychologists, neuroscientists, economists, and sociologists are among the important contributors to our knowledge of teaching and learning, and their research has been invaluable to those of us in the classroom. It has provided numerous insights, including an understanding of how children grow and develop, how brains behave differently under different conditions, and the many facets of working memory.* It has also shown how intelligence, once thought to be genetically determined and immutable, can be increased by interventions, such as high-quality preschool† and rigorous and supportive teaching.‡

However, like medical-related research, these studies give us statistical averages of how a typical student learns, average responses to highly controlled laboratory tests, and the likely effect of a particular intervention within a limited sample of students. And yet, like medical research, educational research requires interpretation to move from statistical averages to helping individual students.

Teaching expertise makes good use of research by integrating it with practitioner insights, the complex systems involved in human development, and a deep understanding of our individual students' needs and context. At a time when we are espousing commitment to every child, this kind of expertise is exactly what's needed.

Back in the late 1990s, when I was first taking classes to become a teacher, a professor at the University of New Hampshire said something that has become a core part of my teaching philosophy. He told us that when a student gets something wrong, our first job is not to give him the correct answer; it is to understand why he thought his answer was correct.§ This is not to say that the student doesn't need to eventually get the right answer; it means that *teaching* him is far more complex than just relaying information.

This professor explained that, for the most part, students don't give random or purposefully incorrect answers (we also talked about the times when they do—a whole different topic). An incorrect answer represents current understanding, and that's the starting point from which a student must be taught.

The example he commonly gave is that when a student gets "1+1" wrong, it makes a big difference whether she answered "11" versus "4." If the student said 1+1=11, then we know what mistake she is making; she believes that addition is literally putting the two numbers together. I can confirm this with my student by asking her what "3+5" is and seeing if she answers "35." If this is the case, having her simply drill her math facts won't actually solve this problem. It would simply be treating the symptom rather than the underlying cause. What I need to do is follow up with a very fundamental lesson about the nature of addition—it will probably involve manipulatives and counting. In contrast, if the student said that 1+1=4, then she clearly doesn't have that same misunderstanding. I don't know what that misunderstanding is—I would need to ask her more questions to figure that out—but the lesson I would then follow up with is bound to be different.

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Ultimately, what I was being equipped to do was expertly analyze my student in order to determine the proper response. This is, at its core, the same as a doctor diagnosing a patient before determining the proper treatment.

This critical approach is not only important when a student is struggling; it also allows us to offer support when he is thinking outside the box. When I taught biology, I clearly remember one tenth-grade student, Daryl, who had been struggling in all of his classes. After a unit on parts of the cell, I had given students more than a week to create their own models of either plant or animal cells.

*For more on working memory and the science behind how students learn, see Daniel T. Willingham's articles for *American Educator*, available at www.aft.org/ae/author-index#quicktabs-authors=4.

†For more on the value of early childhood education, see "The Economics of Inequality" in the Spring 2011 issue of *American Educator*, available at www.aft.org/ae/spring2011/heckman.

‡For more on how IQ is not genetically determined or immutable, see "Schooling Makes You Smarter" in the Spring 2013 issue of *American Educator*, available at www.aft.org/ae/spring2013/nisbett.

§For more on the importance of knowing common student misconceptions, see "Understanding Misconceptions" in the Spring 2016 issue of *American Educator*, available at www.aft.org/ae/spring2016/sadler-and-sonnert.

I hoped that this assignment would appeal to Daryl, who was skilled at and enjoyed working with his hands. Different students presented cells they had made out of clay and papier-mâché and even candies. When it was Daryl's turn to present, he rummaged around in his backpack and pulled out a model car he had built. Nothing on the car indicated that anything represented parts of a cell. The students laughed, he shrugged, and it would have been very easy to assume that he hadn't really done the project.

When I asked Daryl how this represented a cell, his response of rolling the car across his desk was unconvincing. Rather than reprimand him, I asked him some additional questions: "What represents the mitochondria?" "Why?" "How is that different than the chloroplasts?" "Can you tell me more about that?" "Would it be different if … ?"

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With each of my questions, Daryl compared aspects of the combustion engine to a plant cell. Admittedly, my ignorance of mechanics meant that I had to ask even more questions, but revealing his depth of knowledge about mechanics as well as his understanding of cells was well worth it.

Daryl's answers would never have matched those on a prescribed curriculum, and I would have never been able to ascertain his learning without a complex understanding of how thinking develops, as well as a deep understanding of Daryl and a strong relationship with him. Revealing his understanding not only was beneficial for Daryl's grade, but also validated for him that what he learned and contributed to the class was in fact valuable.

Strengthening Teacher Preparation

The ability to truly determine what a student does and does not understand, and then plot a path forward, is central to teaching expertise. As educators, we should be working toward the goal of every classroom teacher having this kind of expertise. That doesn't mean teachers must be experts before they set foot in the classroom—no profession achieves that in its preparation. It does mean that we need to create preparation that leads toward expertise and ensure that new-teacher programs help develop it.

Just as important, we must reject the implicit assumption that teaching expertise is somehow less valuable than research conducted by professionals outside the classroom. As educators, we must use the knowledge from researchers just as doctors apply new medicines and procedures created by companies and institutions: they make decisions based on their own expertise and discretion.

This brings us to the issue of teacher preparation.* In recent years, on-the-job training and fast-tracked preparation have been erroneously heralded as superior to university-based teacher preparation programs.

Yes, theory-based courses at universities may too commonly be taught in ways that do not help teachers once they enter the classroom and often fail to adequately prepare them with practical strategies to, for example, manage student behavior. But it is shortsighted to do away with such programs entirely in exchange for technical training. Such a move once again misunderstands the nature of teaching expertise; it only prepares teachers to *do* what other experts have determined. The best college teacher-preparation programs connect content knowledge with pedagogical skills and the foundational knowledge that empowers classroom teachers to make the complex decisions that good teaching requires.

Granted, I would never want to go to a doctor who doesn't know how to wrap a bandage or give an injection. But I would even less want to go to one who has primarily been trained in the nuts and bolts of medicine but relies on WebMD to make decisions.

When I was working with Daryl, I relied on my knowledge of adolescent development, motivation theory, pedagogical content knowledge for science, and cell biology itself. True teaching expertise is about applying different types of knowledge to the situation and student in front of you.

Is it possible to provide all future teachers with preparation that joins theoretical knowledge and practical skills? Yes. Around the world, others are doing exactly that. Successful education

*For more on teacher preparation, see the AFT's 2012 report *Raising the Bar*, available at www.aft.org/sites/default/files/news/raisingthebar2013.pdf. For more on the history of teacher education, see "Bridging the 'Widest Street in the World'" in the Summer 2011 issue of *American Educator*, available at www.aft.org/ae/summer2011/mirel.

systems such as Finland, Singapore, and Australia require that their teachers master and unite these realms. For example, the Melbourne Graduate School of Education in Australia, regarded as an international leader in teacher preparation, prepares its graduates for clinical teaching, interweaving theory and practice.[†] This program places its students in real classrooms from day one, but makes no compromises in learning fundamental and theoretical knowledge. Student teachers explicitly identify the connection between what happens in their fieldwork with what they are learning at the university. The result is graduates who approach teaching and learning the way doctors approach health and medicine—as true and clinical experts.

Ensuring that teacher preparation programs combine theory and practice is no quick fix, but it is far better and far more comprehensive than what many fast-tracked programs currently offer. Such programs initially attract ambitious and high-achieving individuals, the very same population that is ultimately dissatisfied with a job that requires so little training and relies on only a handful of techniques.

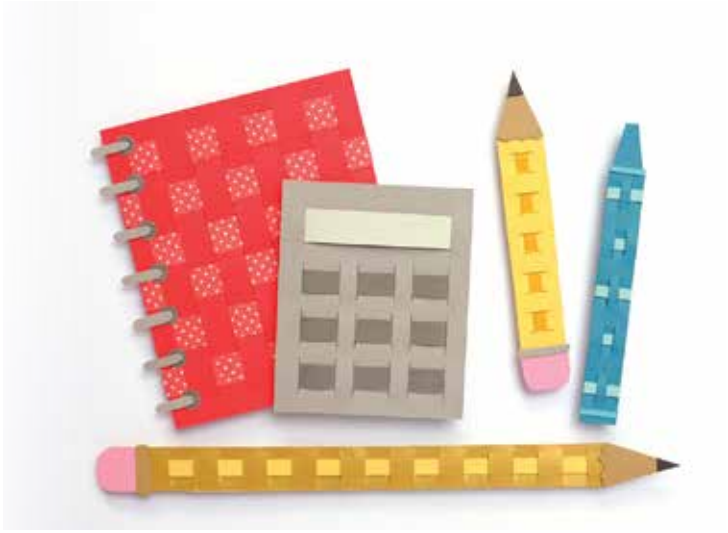
In contrast, by insisting that teachers complete university-based trainings focused on theory and practice, we can rightfully elevate the profession beyond the technical and mechanical. More importantly, teachers who have this clinical expertise will both be able to understand their students' needs and become genuine leaders in their field.

We need not only look abroad to see the value in this approach. I currently work alongside teachers in New Hampshire who are using their teaching expertise to create meaningful student assessments. They have been part of an initiative (the Performance Assessment of Competency Education, or PACE) that is creating common performance assessments designed to assess and support deeper learning by being integrated into their day-to-day classroom practices.[‡] For example, some of their students are building solar ovens instead of taking bubble tests in order to demonstrate their mastery of science content and skills. These research-based assessments were developed by teachers, piloted by teachers, and assessed by teachers.

Creating such assessments requires tremendous theoretical knowledge of science concepts, knowledge of cognitive development, and knowledge about designing assessments that are psychometrically valid and reliable. But it also requires clinical expertise on what works in a classroom to nurture individual student learning. Approaching assessment in this way does not work if pedagogical expertise and subject-matter expertise are viewed as separate and apart; true teaching expertise encompasses both.

Expert teachers can also help change the relationship between research and practice. If they are empowered to contribute to it, teachers can be much more than consumers of research. The best educators analyze their students' understanding, draw on their various types of knowledge to determine a path forward, and carefully examine the results. If many teachers do this in a coordinated and collaborative way, and involve researchers from local colleges and universities, then we can revolutionize both educational research and teaching. After all, research hospitals have become models of cutting-edge medical practice by having doctors partner with researchers in their work.

In 2012, when I made the difficult decision to leave my classroom to begin a doctoral program in education, it was with the intention of becoming part of this change. Being a classroom teacher was the most intellectually challenging and rewarding job I will ever have, and my feeling of loss is only balanced by a hope that I can contribute in a new way. My goal is to work in teacher preparation so that I can help equip future teachers to draw on theory and research in teaching their students. I also hope to support teachers doing research in those schools where teaching interns are placed. Ultimately, I hope my work will help build valuable research knowledge and also encourage pre-service teachers to view rigorous analysis as central to the profession.



The vast number of people who call for reexamining teachers' knowledge and revamping teacher preparation are reacting to real concerns. It is understandable that those who believe the issue is too many low-achieving and ill-informed educators want teachers to gain more advanced knowledge or at least follow the direction of experts who already possess it. And it is understandable that those who believe that teacher preparation focuses too much on philosophy and theory want to just give teachers the nuts and bolts of managing classrooms and writing lesson plans. But reacting to an issue is different than thinking through a real solution.

This false dichotomy of theoretical knowledge versus practical skills leaves us with only bad choices. Other professions have rejected it, and we should too. We should not be asking educators to become either theorists or technicians. The future of all of our students—but especially our most vulnerable students—hinges on their access to true teaching expertise. So how do we strengthen the teaching profession? By preparing teachers with clinical expertise that weaves together theory and practice and empowers them to make the best professional decisions possible for their individual students. ☐

[†]For more on the Melbourne Graduate School of Education's clinical teaching program, visit http://education.unimelb.edu.au/about_us/clinical_teaching.

[‡]For more on performance-based assessment, see "Putting the Focus on Student Engagement" in the Spring 2016 issue of *American Educator*, available at www.aft.org/ae/spring2016/barlowe-and-cook.