

## What is the Most Important Thing We Can Teach Our Students? Ask How We Know What We Know

I am a teacher. Of science – because science is fun and interesting and that’s what I did before I started in the classroom.

But I am first and foremost a teacher of young people on their way to adulthood. Responsibility to my students, and the adults they will become, motivates and informs my work as much, if not more, than high-stakes tests or state standards.

Science isn’t a collection of facts or a lab manual of rote protocols, although the science classes I took in school were an unappealing mix of the two. Actual science, breathtaking in both its complexity and elegance, is the collection of ways we ask a vital, golden question about the natural world: How do we know what we know?

Each morning, I see AP biology students who go on to attend our nation’s most prestigious universities. In the afternoon, I co-teach our high school’s introductory-level science course with a special education teacher. The two populations of students I get to work with could hardly be more different in terms of prior academic achievements. But the intellectual demands I make on them are strikingly similar, focused on uncovering what we know and using that work to solve more challenging or intricate problems. I’ve tried to build my classroom practice to engage and motivate students so they’ll take the **risks required to learn science as an intellectual practice, not just a body of factual knowledge**<sup>1</sup>. In addition, students and I learn together how to find reliable sources when we don’t have the background to fully grasp a complicated scientific situation like climate change or CRISPR.

My goal is not to build rooms of future scientists. Rather, I hope that my wonderful, often-vulnerable teenagers will take this way of thinking, this wondering about what’s behind the curtain of what we take for granted, into their adulthood. Like many folks who find a career they love, I find myself constantly discovering and learning in deeply fulfilling ways. That’s why I care so much about giving my students opportunities to practice habits of mind that will enable success outside the classroom, particularly habits they can use to keep learning

and growing regardless of where they find themselves in the world.

The battle to reignite the patience and curiosity required to ask how we know what we know is constant in the trenches of U.S. high schools. Too many of my students, once kindergarteners wondering endlessly aloud, have been pressure-cooked into fact-memorizing list-checkers on an unending race to nowhere,<sup>2</sup> pallatives for which litter a recent **explosion**<sup>3</sup> of **popular**<sup>4</sup> **books**<sup>5</sup>. Other students in my classes have become deeply disempowered in their educations by the methods their teachers have used, or haven't used, to teach and assess learning.

Those of us who teach our nation's teenagers are also living in parallels of both these realities, often bound by high-stakes testing emphasizing rote memorization and teacher evaluations that focus on shallow subsets of assessment data. Before I started in the classroom, I vilified teachers whose courses looked more like test prep than places of actual learning. Now, though, I feel only empathy for well-meaning educators who, trapped in pressure-cooker environments themselves, find a **'just-the-facts' approach better rewarded and more comfortable**<sup>6</sup> than helping students develop their skills authentically.

By building a memorization-tocracy, we disconnect students who would be more motivated to learn and develop their literacy and numeracy skills by actually engaging in intellectual practices. And we minimize the amount of uncertainty and struggle that our students feel is comfortable during challenges. By asking what how we know what we know, and finding ways for students to unpack the answers, we can replenish some of the intellectual curiosity and resiliency of early childhood in our teenagers.

All of this is well-covered ground in education. But here's the secret I've learned from my time in schools: Investigating our own beliefs and assumptions about our personal and professional lives is just as important for strong, resilient, capable adulthood as any of the academic skills we develop in the classroom. The power of asking what we know and how we know it is far, far greater than becoming a successful college student or a savvy consumer of media and advertising.

Early in my student teaching, I found my assumptions about a bright but low-performing student blown open. It turned out his disquieting lack of effort at school was linked to the equally disquieting reality of being an undocumented

adolescent. As a result of that interaction and our continuing work that year – his, as he began to do more of his schoolwork, and mine, as I began teaching English language learners, specifically recent immigrants, with his input – **that student became one of my most valuable collaborators** and is now on the path to U.S. citizenship. Quite a story, I know, but I have countless others, all stemming from my still-developing ability to step back and ask myself and others about what's really going on in my classroom.

This mindset of asking where our assumptions come from, in science and as learners and as humans, allows people to grow into their best possible selves. After all, at the heart of each of us is the collection of stories we tell ourselves about who we are, who others are, and the narratives we use to describe what's happening. What is the outcome of telling these stories? Are there other stories to tell? How do we know?