Teaching Philosophy

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My teaching philosophy is evolving, and always be. As a research mathematician, I received zero formal training in education in graduate school. I learned how to teach through osmosis, meaning I absorbed methods and behaviors from my own teachers. So, for the first 15 years of my career I used the ubiquitous sage-on-the-stage model, i.e., I talked at students for 50 minutes and they were expected to absorb my knowledge. A “good teacher” explains theory clearly and chooses illustrative examples. Failure was chalked up to deficits in the students. It was simple. All my colleagues agreed, this is how math is supposed to be taught.

I wish I knew then what I know now: I was replicating harmful teaching practices from yesteryear. Indeed, for the last 10 years I’ve been on a journey of discovery, reflection, and self-improvement in the classroom. It has completely changed the way I view education. My current teaching philosophy stems from one principle: effective pedagogy is grounded in research, not history and osmosis. I still have much to learn, but at present I focus on two evidence-based themes. First, instruction should be student-centered, meaning the focus is on how students learn, as opposed to how lucidly I think I’m explaining material. Second, affective and psychosocial experiences are extremely important, particularly for students from marginalized or historically excluded demographics.

A student-centered learning model has radically transformed my class. Students now work in groups at least 50% of the time. Instruction is scaffolded so students conquer bite-sized chunks of large concepts and techniques in their groups. These forms of active- and inquiry-based-learning are known to improve student learning. They also facilitate student collaboration, which is particularly important for the success of marginalized students, as demonstrated in the seminal work of Dr. Uri Triesman. This, in turn, fosters a community of scholarship among students, which is a pillar of the Meyerhoff Program (hence our own Millennium Scholars Program) and known to increase long-term retention among underrepresented students in STEM fields. It also allows students to sharpen skills which are important well beyond mathematics, such as metacognition and communication. Indeed, one cannot explain a problem before one understands it, so students are taught to monitor their own understanding and get clarification on ambiguities before presenting. In terms of affective and psychosocial components, I’m very intentional about building confidence, which is a major contributor to high attrition rates in STEM fields (cf., work of Drs. Bressoud, Ellis, and others), and sense of belonging, which is particularly important for marginalized demographics. I maintain the highest standards, coaching and encouraging students when they get frustrated, as Dr. Claude Steele has shown this counteracts effects of stereotype threat, for instance. Finally, I explicitly promote a growth mindset at every opportunity as work of Drs. Carol Dweck, Mary Murphy and others clearly demonstrates the impact of this belief about intelligence and success.

So, that’s my current teaching philosophy, but I’m not done learning and evolving. And I hope I never am.