

Ironically, it was the recognition for excellent teaching I received early in my career that led to my development as a truly effective educator. As a new professor, I enjoyed teaching, and my students responded positively to my efforts. However, I knew little about teaching and learning beyond personal experience. Fortunately, the awards I won led to engagement with peers and to formation of an invaluable community focused on science pedagogy that has fostered my transformation from a merely popular teacher to a highly effective one.

My teaching philosophy involves self-identity as a coach who provides motivation, prepares drills, supplies feedback, and reiterates the process, all with the aim of promoting student progression from novice to expert. My role is straightforward but challenging – to induce students to do the hard work of learning via full engagement with the training framework I provide. My philosophy and approaches are wholly student-focused and are evolving as I constantly explore new research-based pedagogical principles. In the paragraphs below, I articulate four goals and principles that shape application of my teaching philosophy.

I aim to **build expertise** in my students. The first step in this process is to clearly communicate expectations via development and sharing of clear learning objectives for every course, unit and class. I then provide background material and provide motivation for students to engage with this material independently, often in the form of pre-class quizzes or in-class readiness assurance tests performed independently and in groups. I subsequently implement activities designed to make students practice applying new knowledge. I often conclude lessons by using concept mapping to help students incorporate new understanding into their existing knowledge frameworks. All of these activities are accompanied by feedback to promote development of expertise.

I have embraced **peer-to-peer and group learning** as effective teaching strategies that allow me to fully **partner** with my students in learning. I routinely use Learning Assistants and / or Team Based Learning approaches to foster peer interactions and promote the formation of peer learning communities.

Motivating students has become a core part of my teaching approach. My focus on motivation also provides an example of how my peer community fostered my growth. While I always worked hard at teaching, I gave little thought to student motivation and generally believed that if students chose to disengage from my course, it wasn't my problem. Exploration of the literature surrounding sound pedagogical practice in collaboration with my peers has reshaped my view. I was unknowingly using both research-proven motivating and demotivating practices in my teaching. Sharing my joy in the material as well as my joy of teaching and learning promotes intrinsic motivation in my students. However, my constant striving to challenge students often led to disengagement when students had trouble achieving success at tasks that were too difficult. I didn't fully realize the impact of failure on student motivation because I personally thought trying was fun. I have redesigned learning activities to allow success in a step-wise fashion, building a sense of accomplishment in my students and motivating them to higher levels of achievement. Being deliberative about motivation has deepened my sense of responsibility to my students and helped me pay closer attention to all the tools I can use to boost motivation. As a teacher, I now believe that lack of student motivation is indeed my problem to overcome.

It is fulfilling to leave a legacy in the form of students who achieve greater success in other aspects of their life and education because of their experiences with me. Thus, I am always cognizant of the overarching aim to produce **critical thinkers** with **strong metacognitive skill**. As a scientist by nature and by training, I have a desire to promote critical thinking skills. I have learned how to achieve this goal more effectively. For example, I have developed my skill at a Socratic approach with my graduate students. I have also been challenged by my peer learning group to consider how to promote metacognitive skills in my students. My feedback to my students is frequently focused on inducing them to think about how they have learned as well as what they have learned (or failed to learn) with the goal of developing helpful habits such as stopping to evaluate what you know and how much more you have to learn as an effective learning strategy to be applied in any situation.

I chose Penn State as an ideal environment where I could combine two passions: doing and teaching science. Seventeen years later, I am proud to have developed a teaching approach that is integrated with my scholarship, effective for my students and personally fulfilling.