

Philip Bevilacqua – Teaching Philosophy

The musician Beck said he puts himself into uncomfortable situations to help grow as an artist. Like Beck, I intentionally put myself in uncomfortable positions as a *learner*. I needed to know plant biology for new directions in my RNA research, so I took Developmental Plant Anatomy BIO 407 in 2010 with junior biology majors. I wanted to develop physical models of RNA folding intermediates, so I took CHEM540 from Professor Scott Showalter on the physics of particle scattering in 2011 with graduate students. I sensed a need for my CHEM110 students to see detailed explanations, on demand day or night, so I obtained a Tombros fellowship in 2015 and took the entire online course in Doceri, where I learned how to make and post screencasts. And I went to Italy a few years ago and fell in love “*innamorarsi*” with the country; I’m currently learning Italian from an online course “Coffee Break Italian” and plan to join a student Italian-speaking group in the Spring semester. On top of these formal courses I took as a learner, I regularly *give* group meeting to my research group: I practice talks, present research, and go over ideas for research proposals. I tell my group that I want to be their Sidney Crosby; I want to be their captain and keep playing the game, not just coaching or teaching it. I try to lead by doing and I try to inspire. By putting myself in the vulnerable position of the learner, I am reminded that learning, indeed the entire enterprise of creating new thoughts, is really, really hard. By doing these things, I have my first lifehack into teaching—reflection on my own experiences as a novice learner.

I’ve found that real learning happens best when the learner is involved. I often say that teaching is a verb. My journey into active learning was a slow, decades-long one. It can be traced through how I handle office hours. I took the scientist’s approach. Stage 1: I had office hours but almost no one came. Stage 2: I realized I wasn’t encouraging and approachable. I started taping my lectures and listening to myself in order to practice creating a welcoming and inclusive environment. Students started coming to office hours. I would show students how I solve problems. I then realized that while I was active in this process, the students were not. They weren’t learning very well. Stage 3: I changed my approach and let the student solve the problems at my chalkboard. I realized that the student *still* didn’t understand the problem well, which I learned by asking them for self-explanation. Stage 4: After solving a problem, I then asked the student to solve a related problem, followed by variations on that problem. At this point, most students could create additional variations of the problem themselves, and explain them back to me, and then to another student at office hours. I finally felt satisfied. I had arrived, by a very circuitous route, at my second lifehack into teaching—studying the mind of the novice learner. I found I could now anticipate many of the difficulties of the learner and thereby implement interventions. I’m not particular to the intervention—self explanation, drawing of models, flowcharting, analogies, technologies—I find them all relatively effective. What is key for me is knowing what is going on in the student’s mind.

The most successful, but by far most difficult, active learning I practice is solving research problems with my students. Here we create new knowledge in an open-ended, project-based approach. I obtained my BS from a small Jesuit school, and the value of that liberal arts education has never left me. I have taught over 50 undergraduates in my research group. They have written 15 theses and co-authored 20 peer-reviewed papers. I believe in the thesis and now require it of all my undergraduates, having co-founded the SCIRES program to provide the thesis option to non-honors students. My undergraduates even have two first-author papers, meaning they drove the research and made the major contribution.

I have a strong commitment to climate and diversity in teaching. My classroom is an open and constructive one, with a positive and supportive tone. Moreover, as Department Head, I’ve passed this on to my faculty through faculty meetings, through creating education committees to promote ethics and climate in teaching, and by letting the faculty know how much they are appreciated by their students through inviting e-mails in their classroom. I’ve promoted diversity through running the inaugural Chemistry Workshops for the Millennium program for many summers, as well as partnering with the directors of the program to teach the cohort in my CHEM110H and 110B courses. In addition, six of my graduate students have gone on to teach at liberal arts colleges including Dr. Kathleen Leamy who is an Assistant Professor at Gonzaga University and Dr. Laura Ritchey who is an Assistant Professor at Pitt Johnstown. In the end, my teaching philosophy boils down to this: understand how a student thinks, try to inspire, and above all else be approachable.