

## Teaching Philosophy

Chemistry is a daunting subject for many people, particularly college students, where a common sentiment is to simply get through the class as quickly as possible and emerge after finals as a survivor. Students can bring anxiety and uncertainty with them into class if they view chemistry as a nearly impossible test of endurance where they can do very little to affect the outcome of their success. These feelings of anxiety and uncertainty can become burdensome and prevent effective learning and performance.

I was no exception to this sentiment, but my view of chemistry changed when I took organic chemistry with Dr. Marvin Miller. Dr. Miller's calm demeanor and persistence in asking guiding questions for students to draw conclusions, think critically and solve problems built confidence in me and my classmates to take control over our success in the class. He was a motivator and enabler of our learning instead of a source of the answers to test questions. In Dr. Miller's class, I was able to find and nurture an excitement and genuine interest in chemistry that caused me to change my major, join an organic research laboratory and become an organic chemistry tutor. During my time tutoring, I found an excitement and passion for teaching that I've pursued ever since.

During my first semester at Georgia State University, I was a teaching assistant for the organic I laboratory which, like all chemistry laboratories at GSU, is an inquiry-based double blind laboratory. Students became anxious when they realized neither the TA's nor the instructors knew the 'answers' because there was no 'right answer.' In this lab, I was forced as a TA to become a facilitator and mentor to my students instead of an orator full of answers. It was my task to probe my student's prior knowledge and appropriately guide them to interpret their own data and form their own conclusions. I was wonderfully surprised when my students began to enjoy their experiments and they were extremely satisfied in themselves when they drew their own logical conclusions from the evidence before them using their prior knowledge. Since then, I've had the opportunity to teach the general chemistry laboratories as an instructor of record and co-teach a chemistry-biology hybrid class for students in the College of Education using four primary goals that I set for myself as an educator:

- I strive to cultivate excitement and curiosity in students so that they will be motivated to inquire about the world around them through activities linking course material to students' interests or introducing topics within a broader context with which students are already familiar. To do this, I use activities such as "What's in the box?" or I develop case studies for students to work on in groups. Additionally, the internet is home to a plethora of engaging videos that are relevant to course material. When applicable, I use such videos to introduce a topic or problem.
- I work to facilitate students' learning through effectively communicating course material using inquiry-based methods to equip and empower students to think critically, solve problems and draw reasonable conclusions from data and evidence—all skills to be used inside and outside the context of chemistry. In class, in lab and in office hours, I pose questions to guide students to come to a conclusion and learn a new concept using their prior knowledge. Similarly, when students ask a question, I follow up with guiding questions to help them connect what they know to discover their answer. Lastly, I work as many problems as I can during class time in a step-wise fashion where the class determines the next step—this way, the students can discuss and teach each other in a collaborative way.
- I seek to probe, reinforce and supplement students' foundational knowledge and content knowledge through assessment and immediate feedback techniques using technology (such as clickers) and collaborative learning techniques like group quizzes and group activities which research suggests are more effective than traditional methods in information retention<sup>1-2</sup>.

- I encourage students interface with course material outside of class and laboratory time by holding office hours, study sessions and providing extra resources online. In addition to inviting students to these office hours and study sessions, I work hard to apply a personal touch by learning all of my students' names so they feel welcome and comfortable seeking help. For students who are unable to attend these sessions because of their schedules I remain flexible for appointments, but I also write tutorials and study material from the common misconceptions and mistakes in office hours and I post them online for all students to use.

In order to teach a diverse set of students with a diverse set of learning styles, an educator must be flexible in adapting and adding new techniques, tools, assessment methods and teaching methods to his or her repertoire. In the past I've attended, and I plan to continue attending professional development workshops and conferences on chemical education and pedagogy as well as keep abreast current chemical education literature. In addition to personal development through workshops and conferences, I am committed to learning from my own assessments from my students. I encourage students to leave detailed reviews and assessments on my teaching evaluations so that I am able address my flaws to teach more effectively next time.

Mentorship is an important aspect of teaching that goes beyond the classroom and beyond office hours. In my graduate experience, I've had the opportunity to mentor many undergraduates in my research laboratory as well as students from my classes. I've enjoyed working with my mentees in the lab and meeting with them to help them navigate the rest of their collegiate career and beyond. Students' plans don't always go in the direction they expect them to go and can be stressful, but my students have expressed gratitude in having a mentor to guide them and help them de-stress and re-evaluate their plans with a clear mind.

My main interest in teaching is for organic chemistry, but I am also prepared and capable of teaching general chemistry classes. As a GAANN fellow at GSU, I have had the opportunity to develop curricula and hands on activities to adapt into K-12 schools as well as college-level courses. Some of these activities are the beginnings of a cooking chemistry course. Not only would it be a fun elective that students might be interested in, but such a class could help students draw connections and solidify their chemical knowledge and foundation by connecting concepts in a different framework. It could also be a useful class for non-majors and non-traditional students that introduces them to foundational chemical concepts in a familiar context.

Students enter into university with a diversity of goals and aspirations. As an educator, I want to help my students achieve their goals and become successful not only with a great understanding of chemistry, but my hope is that they leave empowered and equipped to find solutions to the problems they'll encounter with ingenuity and confidence.

1. Johnson, D.W., Maruyama, G., Johnson, R., Nelson, D., and Skon, N.L. "Effects of Cooperative, Competitive, and Individualistic Goal Structures on Achievement: A Meta Analysis," *Psychological Bulletin* (89:1), 1981, pp. 47-62.
2. Slavin, R.E., Sharon, S., Kagan, S., Hertz Lazarawitz, R., Webb, C., and Schmuck, R. (eds.). *Learning to Cooperate, Cooperating to Learn*, Plenum, New York, NY, 1985