Teaching Philosophy

When I first stood in front of a classroom as a student teacher, I felt the distinct responsibility of teaching, and I remembered those who came before. Up to that point, I had received generous support from my mentors and advisors. Without their guidance, I would have never envisioned myself teaching others. I thought about Mala Radhakrishnan, my advisor at Wellesley College, whose pedagogical lineage traces back—advisor by advisor—to Galileo Galilei. I saw that the relationship between advisor and student is a branch of a tree; a sort of heritage akin to a family tree, where each advisor develops a philosophy, inspiring their students to go on to teach and adopt a philosophy of their own. I find it fascinating that this 400-year-old branch is one that I, a blind female chemist, am a part of. My foundation in chemistry and my broader academic heritage drives me to start a branch of my own by inspiring students of chemistry, science, or any other field. I want to invest in my future students just as my advisors invested in me, and as theirs invested in them. To do so, I emphasize three facets of my philosophy of teaching: communication in science, active learning through interaction and demonstration, and the inclusion of every student.

Communication is the foundation of scientific progress, for not a single scientist stands alone in research. If one cannot communicate their findings clearly, others cannot build upon those results. I want to stress the importance of this concept to my students and teach them to communicate clearly through writing, presenting, and conversing with collaborators. To build communication between classmates, I will implement accessible, peer-oriented elements within my approach to interactive learning–no matter the class size. For example, I will use methods like "Think-Pair-Share" in undergraduate classes, or peer review in upper-level research writing classes. To teach clear communication, I, myself, must exhibit this skill. Recently, some members of my research group and I taught a theoretical computational chemistry seminar. There, undergraduate students learned how to code molecular dynamics simulations of Argon in the microcanonical ensemble. When asked for a review of my performance, a colleague noted, "I was impressed by how [Mona] interacted with the students and made sure everyone was on the same page. She encouraged all the students to participate in discussions and ask questions if they did not follow." If you had stepped into my class, you would have found students collaborating with one another and openly asking questions in an active classroom environment. That day, my goals included communicating clearly, engaging with the students, encouraging respect, and setting an expectation of active participation in class. Ultimately, I wanted to highlight the importance of communication between student and instructor and communication among peers. This led to a productive and interactive learning environment that I hope to emulate in my teaching career.

To better cement the knowledge of chemistry into their students' minds, a teacher should utilize active learning processes. An instructor who only reads from slides or administers exams creates passive processes for their students. I want to create active learning processes in the classroom. I will start by assessing students' existing knowledge. Then, I will use that knowledge to find where to begin a lesson and which elements to focus on. Throughout the class I will continually ask probing questions so that I will know whether to clarify, expound, or move on between topics. For example, in a general or physical chemistry class, at the beginning of each week I will assign a set of questions about the material that will be taught that week. The students will have a chance to attempt to work through the

problems, which will foster critical thinking and assess their previous knowledge. After they learn the material, the students will have another chance to answer the questions. Then, after handing in their answers for grading, I will allow students to design their own questions in a group. They will not be graded, but the best-quality questions will be used on the next exam to assess the entire class.

There are many abstract concepts in chemistry that we cannot see, like the structure of the atom or the mechanism of a reaction. As a professor, I will use interactive modes of learning such as practical demonstrations, three-dimensional models, and in-class experiments to make these abstract ideas more tangible. Demonstrations, models, and experiments are practical forms of presentation for an introductory class that will help me showcase my own enthusiasm for the subject matter and retain the students' attention. To promote inclusion and communication in larger class sizes, I will inclusive technology, like the blind-accessible iClicker Reef, to engage students with questions. For more complex problems in an advanced class, I will need to implement active learning in more creative ways. For example, in an upper-level computational chemistry course, I will create a project where students will investigate a chemical problem within their own interests. This project is an active process that will empower the students to apply the computational chemistry concepts they have learned. As a professor, I want to bring these practical applications into teaching the field of chemistry so that I can inspire students like my own professors inspired me.

As I progress as professor, I hope to learn alongside my students by listening to their feedback and responding to any difficulties they might have. Especially for larger classes, office hours will be an important strategy in having the change to develop my students and work through their questions. I do not want to cut off any potential branches of the pedagogical tree; thus, I want to inspire my students to be well-rounded and confident contributors to the realm of chemistry, undeterred by biases and unjust assumptions others may have held against them. My Wellesley advisor, Mala, invested in me as her student, even when others saw my blindness as an inconvenience and a risk to their productivity. She believed that preconceptions placed on a student by others not define their capability. Professor Radhakrishnan showed me that unbiased inclusion can inspire students, allowing them the opportunity to live up to their full potential, as it did for me. I will follow her example, always looking for aptitude in places that many might overlook.

When I was a chemistry teaching assistant at the University of Florida, I was able to implement my teaching philosophy. I created a classroom environment that fostered conversation and discussion as I engaged students in open questions and dialogue and administered a shared responsibility of reading course material aloud in front of the class. A past student of mine originally doubted she would be able to learn in a classroom guided by a blind instructor. She wrote in her course evaluation, "at first, I thought being blind would compromise [Dr. Minkara's] teaching style. I was wrong. I was actually very attentive in class, and she always motivated us to get on the chalkboard and practice." By asking students to read presentation slides aloud, to transcribe critical points on the whiteboard, and to openly contribute, the class benefited from a unique approach as evidenced by its surprisingly high attendance rates. Some students even came from other sections to attend mine. This is not only a testament to visually disabled teachers, but a testament to a diversity of thought and a sense of community.