TEACHING STATEMENT

There is nothing more inspiring to a teacher than the look in the eye of a student experiencing that “aha” moment. It is a transformation I have been lucky enough to both experience and witness time and time again, and it is this moment of understanding, along with my love of the sciences, that drives my passion to teach. Teaching is not only giving students the tools they need to succeed, but also inspiring an excitement about the material that spawns questions and a quest for knowledge beyond the binding of a textbook and walls of the classroom.

Clearly, one cannot have an understanding of chemistry without the basics. Learning the fundamental concepts in the beginning of a science curriculum is absolutely crucial to critical thinking about more complex ideas as a student progresses in the program. Terminology, formulae and the ability to efficiently navigate the periodic table give chemists a common language. They also give students who do not wish to continue in chemistry the skills to analyze their world from a different perspective. Practicing problem solving and extricating important information from a real world scenario is the best way to give students confidence in their skills and abilities.

One common problem with teaching science is keeping lessons relevant. Often, students struggle with the linkage of scientific concepts to the outside world. Chemistry can feel very abstract, since many have trouble seeing a connection between formulae and beakers and their own lives. My lessons have always stressed analogies and related topics in the lab to familiar ideas. One of the most memorable and descriptive examples of such a teaching style comes from my high school chemistry teacher, who was introducing the concept of limiting reactants. She compared the reactant in excess to leftover turkey after Thanksgiving. She illustrated that eventually one would run out of bread, so it would be impossible to make any more turkey sandwiches or products in a reaction. The reagent in excess could also go on to do other reactions, or, in the case of turkey, could be included in a casserole instead. This illustration, though very simple, obviously made the lesson more tangible. It also ensured that her students would not quickly forget the concept of limiting reactants.

Beyond the pursuit of knowledge is the questioning of what we know. Life teaches us to redefine things we previously held to be true, especially when new information emerges.
Questioning leads to refinements of theories, to new research frontiers and to a deeper, more internalized knowledge of concepts. Questioning the material draws a student from the Ideal Gas Law to the van der Waals equation, as it quickly becomes evident that the Ideal Gas Law is flawed. Questioning leads students forward from analyzing the ostensible symmetry of a molecule to quantifying said symmetry through the use of character tables to thinking about the implications of the symmetry for the hybridization of orbitals. I always encourage students to question everything, and I strive to do the same. Asking questions hinting at the limitations of a theory can help a student logically deduce the next step in refining it. Sometimes questions need to be asked differently in order to help students think about the question from a different perspective. This leads to greater understanding and assists in developing critical thinking skills. Questions drive teaching and learning.

In the end, even the best techniques will fail if a teacher does not love his or her job. I have been teaching as long as I can remember, starting with “helping” my parents grade their math and physics papers as a child, moving to tutoring and teaching preschoolers in church as a high school student and then teaching on a higher level as a college student, both in the community and in a more rigid academic setting. Of course, this continued into my graduate school career, where I taught General Chemistry lab, after which I sought out the opportunity to teach religious education to high school students. I am currently in the midst of running an entire course at Immaculata University, and the process has been both challenging and rewarding. The students constantly challenge my way of thinking as I challenge theirs, and that dialogue helps both the student and the instructor grow. I have found that if the teacher is excited about teaching, with a goal of keeping the curriculum exciting, the students will follow suit. They should realize that the person standing in front of them is not only interested in science, but also cares about them and their difficulties, strengths and challenges. I strive to do this with each class I teach and with each student I instruct. It is important, as a teacher, to keep an open mind and to approach the students in whatever way speaks to them. Each classroom is a diverse group of individuals with various levels of ability and experience. There will always be students who understand everything with little or no guidance, those who try but just do not identify with the material, and those who have dreaded entering a chemistry classroom or laboratory all their lives. It is only through different approaches, excitement for the material and constant questioning that one can hope to experience and witness that “aha” moment in every student and in one’s self.