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Teaching Philosophy Statement

Georgia Tech along with every other institute of higher learning has an obligation to put academics above all else. With so much emphasis on research funding, proposal writing and grants, professor's time is wearing exceedingly thin, often at the expense of classroom preparation and in my experience even attendance. As teaching assistants, we aren't subject to funding requirements or administrative pressures; our efforts can be aimed solely towards instruction. As a teaching assistant, our passion and our purpose can be purely to educate.

When I was asked to instruct a laboratory or review class, I never formally addressed what my teaching philosophy was. I don't think it's something you consciously formulate prior to preparing notes or instructing a class. A teaching philosophy isn't an outline for each lecture but rather a belief that's ingrained into our minds. Matt Kaplan, associate director of the Center for Research on Learning and Teaching at the University of Michigan emphasized that everyone has a teaching philosophy, whether they realize it or not. His contention was that even though you may not be the most experienced instructor, you are an experienced student therefore have many opinions about what works and doesn't work for teaching. I recently had a conversation about teaching philosophy with a good friend of mine, Dr. Will Hughes, before he left Georgia Tech. His teaching philosophy is simple: "We all have something to learn, as well as to teach." I would most certainly agree.

There are some people who are natural born teachers; they possess an innate ability to absorb information and explain it with ease. I was not fortunate enough to have been born one of those people. Instead I was provided with gifts of motivation, desire and perseverance. The best way for me to explain how I learned to teach is to explain how I learned to play basketball. I was not the best basketball player on my team, so I decided that if I wanted to play I'd have to be the best basketball student. If I couldn't compete with talent, I would compete by having more knowledge and understanding of the game. I practiced more hours, studied more film, broke down fundamental movements and discovered patterned behaviors of other teams and players. I repeated this process until I could anticipate what the other team was going to do. In this way I never had to be fast enough, or tall enough or any of those things that can't be taught...I only had to be smart enough. The same mentality that allowed me to succeed on the basketball court has also allowed me to succeed as both a student and teaching assistant.

I've never found a substitute for hard work either as a student or a teacher, therefore my approach to teaching has involved hours of preparation, note taking and practice. Just as I felt the need to understand where players on another team would and wouldn't move, I felt that I needed to understand why certain answers were right and why others were wrong. I worked to gain enough foresight into the problems and experiments we were studying so that I could predict the common errors students might make. By knowing those errors I could preemptively show students not only how they were wrong, but also why they were wrong. My high school coach, Richard Jones, used to tell me "practice doesn't make perfect, only perfect practice makes perfect." When this philosophy is applied to the classroom or laboratory it means that merely telling someone a method to solve a problem or perform an experiment isn't enough, you need to show and explain to them why it's the correct method so that they can in turn practice it correctly. The fundamental concept is that it would be better not to practice at all than to habitually practice incorrectly.

I was able to experience this first hand during my first year as a laboratory instructor for MSE 3020, the materials undergraduate laboratory class. My first week required me to instruct students on how to perform electrical property measurements on ceramics and metals

using DC characterization techniques. I was green to lab instruction and teaching, but was determined to prepare hard. I thought about my undergraduate days, what teaching techniques were effective and also what my biggest challenges were with learning in lab-based classes. I remembered that the hardest part of a lab-based class was retention of all the new information, lab procedures and equipment operation between lab sessions. I set out to proactively eliminate potential issues by developing my own laboratory handouts. The handouts had both detailed schematics as well as corresponding explanations in order to accommodate different learning styles. They contained word-bank exercises where the students had to fill missing words into paragraphs so that they could extract important definitions and descriptions of the lab we would be performing that day. I also provided an experimental procedure, critical equations and pre-arranged data tables with blank spaces where their results could be written. By taking the time to build these handouts rather than use existing ones, I was able to complement my teaching style with written text and ensure that the students took the correct notes and observations such that they could review the laboratory at a later date and be able to understand and remember what they'd done.

After four years of serving as a teaching assistant for MSE 3020, I'm gaining more understanding of just how important it is to put the student in a position to succeed. I've realized that the outcome of a student's efforts could be drastically improved if I did a better job of putting them in a position for success. It's all come back to perfect practice, the repetition of executing experiments and performing calculations the right way. For instance, rather than leaving certain calculations as an out-of-class exercise, I needed to make sure that, as a group, we went through equations, discussed what they really meant and where they came from, understood how to manipulate them and finally came to a consensus on an answer before leaving. Simply by understanding my role as an instructor and modifying my approach and methods, I've seen dramatic improvements in the student's results. It's gratifying to see year-over-year improvement in the students you teach, and even more gratifying to know that you had a role in determining that success. This year I've felt that success more than ever as four of my previous students have asked to do their senior research project under my direction. They want to perform electrical property experiments on novel composite fuel cell interconnect materials using the same techniques learned in the MSE 3020 lab class. While speaking with them about proper experimental procedures, they referenced my lab handouts and said that they already re-read them, now almost a year and a half later, and understood exactly what to do. It turns out that they'd referenced them often for materials definitions, descriptions and introductory material for other classes and reports.

Teaching should never be approached as a requirement, but as a responsibility for having been taught. Knowledge isn't a commodity available to some and restricted to others. I'm willing to teach anyone who asks because I remember what it was like being a student and getting turned down for help because they weren't the specified TA for that class. In fact some of my most effective work has been the result of spur-of-the-moment questions asked by a group of students while I'm sitting in our departments common area. At that point I'm not a teaching assistant at all, there's no formality to it, I'm just one student trying to help another, which is just how it should be. When you teach you have the opportunity to make an impact on the lives of future engineers, scientists and teachers. I feel that my effort and subsequent performance dramatically effects whether or not students become excited about the subject matter. And though my teaching philosophy evolves every time I begin a new subject or school year, my emphasis remains on doing my best to put students in a position for success through perfect practice.