Teaching Philosophy Statement

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Mathematics has always been a fascinating subject that I grew to love throughout my education, and as my passion for teaching became apparent during my time as an undergraduate, I knew that being a mathematics professor is what I wanted for my eventual career. Although teaching mathematics is a challenging task, I try to educate my students at a deep level of understanding and attempt to show my students how captivating mathematics can be, while focusing on reaching students of all backgrounds and learning styles.

As an instructor, I feel as though my job is not to help prepare my students to get the best grades they possibly can on the homework and on the exams. Instead, I believe the goal should be to impart a deep understanding of the course material that allows my students to apply the mathematics they have learned to succeed in subsequent math courses, in related science or business courses, and in their future workplace. To accomplish this, I try to focus in-depth in lectures on the theoretical background of concepts and on the step-by-step processes that we go through to solve problems. I want my students to learn these processes and learn to think analytically instead of having them care only about finding the final answer, because they will need to use similar problem-solving strategies in future situations. It is also crucial for my students to develop the ability to communicate mathematics, which I have previously promoted by having students present their solutions to worksheet problems on the board in recitation. Explaining their work to the class helps the students learn to convey their thought processes to others and gives the rest of the students an opportunity to see different approaches to solving problems that they may not have used. Lastly, I try to spend a portion of each lecture on problem-based learning in which my students work problems on their own, in groups, or within think-pair-share activities rather than simply watching me do examples on the board, keeping them more engaged and actively involved in class. These ideas help students retain the knowledge they gain from my course and apply that knowledge in futures courses or jobs.

One of the major goals that I have as a teacher is to stimulate my students’ interest in mathematics. It is important for a student’s success in a course for him or her to be motivated to put in the necessary work and study time. A key for this motivation is for the students to find mathematics to be interesting, useful, beautiful, and even fun. I have always found math to obtain these qualities, but it is often difficult to convince students of this if they are only in a math course to fulfill a general education requirement or because their major forces them to be there. The first step is to show that the material they are studying will be useful to their lives by using relevant application problems as examples, and then I try to display its beauty and intrigue as well. One example would be how I once introduced the basics of my research related to the study of partially ordered sets to some of my MathExcel students in recitation. This helped display the vast world of interesting mathematics that exists beyond the mundane activities of working with functions and equations that calculus students are used to doing. I have found other ways to show the fun side of mathematics to my students in lower-level courses. During the graph theory chapter in my Contemporary Math course, I showed my students how the popular smartphone app Glow Puzzle is identical to the homework I assigned them, as the goal of the game is to find Eulerian circuits within a graph, albeit the app is more colorful and visually stimulating than a typical
online homework problem. With innovative means of introducing the course material, I hope to alter the common attitudes of college students that math is a boring, useless subject to help spur my students’ self-motivation and maybe even convince some to enter a more mathematically-based field of study.

Another of my goals is to teach effectively so that students of every background and knowledge level can reach their full mathematical potential. I have taught a wide variety of students throughout my first few years as an instructor, from the non-science majors in Intro to Contemporary Math to science majors with poor math backgrounds in Precalculus, to the advanced students in Calculus III, to future Elementary and Middle School teachers. Even within individual sections, one can find a vast array of background knowledge levels. To cope with this problem, I try to keep the majority of examples in lectures at a level that every student can follow, then challenge my students at a deeper level on homework problems, making sure I am frequently available for office hours if they are too much of a challenge for some students. I also try to always maintain a positive attitude when students ask questions or answer questions incorrectly in class, as well as when helping students outside of class in order to keep my students’ confidence levels high. An additional strategy to fulfill this goal is to divide students into groups to do worksheet problems with each group representing the diverse skills that exist within the section. Grouping quieter students with more vocal students and matching the brightest students with less advanced students generates teaching opportunities within the groups. This helps bring along students who have more trouble with the material as well as improve the stronger, more vocal students’ ability to communicate and develop their knowledge.

In addition to helping students of all backgrounds accomplish the learning outcomes of my course, I recognize the different learning styles that students have and strive to optimize the learning across those various styles. As an example, many students are visual learners and many also experience improved learning through the use of technology. To help these sets of individuals, I use the dynamic geometry computer program Geogebra for topics such as demonstrating in a Calculus course how secant lines over small intervals of graphs can be used to approximate tangent lines. Furthermore, I have previously implemented inquiry based learning techniques such as guided discovery in my Math for Elementary Teachers courses by using hands on activities to help my students gain knowledge about areas and volumes of shapes as well as to learn about the Platonic solids. These strategies create a more interactive, visual, and experiential learning environment that would benefit this type of student. Based on reading David Kolb’s “Learning Styles and Disciplinary Differences” while taking the College Teaching and Learning course as part of the Preparing Future Faculty curriculum, I have learned about the variety of learning styles that exist, which Kolb characterizes into four categories based on one’s preference of either abstract or concrete thought and either reflective or active learning. With this in mind, I can create homework problems and classroom exercises focusing on one of these particular skills such that each student has certain problems on which he or she should excel. These strategies help students of all learning styles succeed in my courses.

In pursuit of these goals, I continually aim to improve my teaching through the available resources at UK. I want to be the best teacher that I can for my students today, as well as when I graduate and move on to a professor position elsewhere; hence, I am always looking for teaching innovations and ways to improve my pedagogical skills. I have previously implemented mid-semester student evaluations, used the Center for the Enhancement of Learning and Teaching to gain feedback on my teaching, participated in many on-campus teaching workshops, and taken coursework to earn my Certificate in College Teaching and Learning. These resources have had a great impact on my teaching and have helped evolve my beliefs on how to be the most effective teacher for my students.