Teaching Statement

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1. Introduction

I am currently an Assistant Professor at Gannon University in Erie, Pennsylvania and am teaching 12 credits per term. My past experience has consisted of being a Visiting Assistant Professor at the University of Oklahoma teaching linear algebra and multivariable calculus, being a primary lecturer for four introductory courses at the University of Michigan while in graduate school, and being a teaching assistant for various levels of calculus at the University of Dayton. I am looking forward to future opportunities to teach a variety of mathematics courses at all levels and share my enthusiasm for mathematics. Based upon the breadth of courses I have taken, especially while an undergraduate, I believe I have the knowledge to teach a wide range of mathematics courses.

Even though I find great delight in teaching, my personal enjoyment must come second to the necessity that I be an effective communicator of ideas in order for me to be a successful instructor. In order to accomplish this goal, I have relied upon three main tactics: actively engaging the students during class sessions, thoroughly preparing for each class while looking ahead to the future of the course, and judiciously applying technology to classroom learning.

2. Presentation and Student Participation

Based on techniques of the teachers I have admired during my education, I have striven as an instructor to maintain a high level of interaction between myself and the students during lectures. This has involved asking the students to fill in some of the details of an example being worked on the board or asking someone in the class to give a definition or result from the previous reading assignment instead of watching me dictate it and write it on the board. From my experiences as a student and teacher, I have found that this can also be a valuable practice in proof-based courses, where the instructor can ask the students to suggest what should be the next step in a particular argument.

I have also tried to increase the active role of the students by having them work out exercises in groups of three or four during class. I have had varying levels of success in this attempt, but I believe many students can benefit more from trying a problem on their own than from watching me work it out on the board. Part of this process also includes having one or more students present the solution to the rest of the class, which ensures that the entire class will see a correct solution in the end and provides the presenting students with practice in the art of communicating mathematics.

By trying to change the students' role from passive observers to active participants, I believe that students will take a greater interest in the lecture and be more aware of their levels of understanding, and thus, be more motivated to ask questions about areas that are unclear. I, as the instructor, can then better gauge the general comprehension of the class and be aware of possible areas to re-emphasize next class. If I have a better sense of where the class's strengths and weaknesses lie, then I can better tailor my preparation of material to help them as best as I can.

Trying to actively engage my students has required that I display a lot of energy and excitement during class in order to obtain the most active reactions from my students. Fortunately, it is rather natural for me to be excited while presenting mathematics and, more importantly, I believe this approach has been successful. I have frequently had students tell me they enjoyed my lectures and valued the open atmosphere for questions. As one of my students remarked on an evaluation from the Fall of 2003, "I appreciate the enthusiasm and patience Mr. Dietz showed for the course and students. He explains the information clearly and is open to questions. Good job, Mr. Dietz!!"

3. Preparation

When preparing material for presentation to a class, it is important to consider not only the material for the next lecture, but to think about what happened in the last day's class and where the current material is leading. For me this means evaluating how the previous class went and looking for signs of trouble that need to be addressed. Perhaps the questions asked by students after class or during office hours hinted that I could have presented some material more clearly or that I should have spent more time on a particular

concept or example. Due to the structure of mathematics courses, it is vitally important that students have a good grasp of the current material if they are to have the best chance at comprehending future concepts. It is then also crucial to correct trouble spots as soon as possible.

I also make a point to think ahead about what is coming up in the course in order to provide motivation for what we are currently studying. As an example, while introducing the derivative, I will mention some of the problems, such as optimizations, that the class will eventually be able to solve using derivatives. This also includes looking ahead to future courses the students might take both inside and outside of mathematics. For instance, when discussing how the tangent line is a linear approximation of a function at a point, I told the class that this is a topic that will be investigated more deeply in the next term when they study Taylor polynomials. This method can be justified to the class by telling them of the great practical nature of approximation, which is often used when programming trigonometric functions into computer software and calculators. It may also help show them another way that mathematics can be useful in the "real world."

4. Technology

Finally, I believe that technology can serve as a valuable aid for understanding mathematical concepts. One instance where I think this works particularly well is the introduction of the concept of a limit. The "Table" feature on many graphing calculators allows students sitting in class to "see" a limit in action because they can enter a function, type in a decreasing sequence of Δx's, and immediately have a corresponding column of outputs that can give very strong intuitive evidence for the existence or non-existence of a limit.

While a student and teaching assistant at the University of Dayton, I grew to appreciate the utility of computer algebra systems, such as *Maple*. Especially in the setting of a multivariable calculus class, these software packages can be an amazing tool that allows students to see the objects they are dealing with and even handle them by rotating and changing the ranges of the plots.

When making use of technology in the classroom, it is also important to discuss the potential pitfalls of relying on it too heavily and to demonstrate to the students that they should not have blind faith in a calculator. I provide warnings about how a graphing tool may fill in the holes in a rational function, make a differentiable point of a function appear singular, or make a polynomial function appear to grow more rapidly than an exponential function due to the ranges of the plot. I believe these sorts of cases help to convince students that despite much of the ease technology has produced, it is still necessary for people to understand mathematics well enough to be smarter than the machines.

5. Conclusion

As a young teacher, I know I still have plenty to learn, but I believe I have already profited from the experiences I have had so far. While I received lukewarm evaluations the first time I taught at the University of Michigan, I have had very positive evaluations since then, including ratings that ranked me in the top quartile of all instructors in the College of Literature, Science, and the Arts at the University of Michigan. I have also been touched to see on several students' evaluations that they considered me one of the best math teachers they have ever had. A Calculus II student at the University of Michigan commented that I "really showed interest in the subject and most importantly seemed very concerned and dedicated in making sure students understood the material. Geoff was always open and happy to answer questions and had a great attitude."

I am looking forward to teaching in the years to come and am hoping that I can spread my excitement for the mathematical field to many more students in the future.