Teaching Statement

Wei Zhu

October 30, 2006

The field of mathematics is like an enormous cavern: Theorems support the weight of the structure; formulae and definitions fill the space like glittering gems; passageways lead to unknown depths. As mathematicians, we lay out paths so others may follow in our footsteps and visit the sights we have seen. When we teach our students, we are inviting them to see the wonders we see, and what they get out of this experience depends largely on how we lead the tour.

Every student is capable of developing his or her mathematical ability. To teach students effectively, however, we have to accept that their goals, backgrounds, and interests are usually different from each other. In order to help students learn, I strive to determine where they are from mathematically and where they want to go. With this in mind, I give students a questionnaire on the first day of each course I teach, asking about math classes they have taken, their majors, reasons they take this class, and what they most want to see in this class. This information helps me make each course more student-oriented. For example, in the summer of 2005, I taught ordinary differential equations, and I am teaching the same course this semester. Through the questionnaire, I discovered that more than half of my current students are from engineering backgrounds, so I changed the course focus to spend more time on numerical solutions and real-world modelling. I also emphasize the practical use of Matlab to analyze and solve ODEs, tailored to fit the needs of an engineer.

Lecturing is a sophisticated process, which involves more than just presenting material to students. While preparing for lectures, I make a point to present the current materials in relation to previous sections. In this way, I lead students to view the course as a continuous effort toward the goals previously set in the syllabus, instead of a series of independent and abstract concepts and topics. At the beginning of each class, I write down key words from previous class and the goals of this class and then tie them together.
briefly. During the class, I give as many illustrative examples and simple pictures as possible because I believe that frequent use of those elements can convey complicated mathematical ideas in a more direct and understandable way. When explaining difficult materials, I look for signs that indicate students are having trouble understanding me, and pause frequently to ask for questions. When a student answers a question, even if the answer is incorrect, I give them some positive feedback. When a student asks a question, I am sure to not only answer the question, but also point out reasons why the question was important or thoughtful. In the student evaluations, I have been consistently praised for my ability to create a friendly, interactive and informative environment in class.

As an instructor and student, I think incorporating technology provides great aid in the learning process, especially in a math class. Indeed, with the help of technology, we can bypass some of the unnecessary formalities and lengthy computations that can divert attention from more important matters and more readily present the integral ideas of mathematics. For example, I use Matlab to show my ODE students the long-term behavior and the classification of equilibrium solutions of autonomous equations.

Homework assignments should not just be methods of assigning grades and forcing students to work. I believe that the feedback assignments provide gives strong insight into students’ true knowledge of mathematical objects and can be used to plan my next lecture. I also use the assignments as guides to create handouts for students wherever I find them having trouble. Moreover, I encourage students to work collaboratively on homework because most people learn better and show more motivation when they are sharing their knowledge with their peers.

Teaching does not end in the classroom. Helping students outside the classroom is a vitally important part of teaching. This can be done through office hours, help sessions, lab sessions, and even answering questions via email. I am accessible as much as possible to help those students who do not catch the ideas in class. Visits during office hours or just stopping by are always encouraged. Students are more than welcome to put forward suggestions to improve the course. I maintain a constant dialogue with the teaching assistants running help sessions to get an idea of my students’ performance, and what they need further assistance with.

With my strong background in mathematics and extensive teaching experience, I am a confident and qualified guide in this fascinating trip. Personally and professionally, I look forward to leading the next generation of mathematicians as we explore the cutting edge of the field.