Teaching Statement

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I believe that teaching is a rewarding responsibility. My students deserve well-planned classes and patient guidance during office hour. I derive pleasure from witnessing their academic growth. Teaching fulfills my personal goal to impart enthusiasm for mathematics to younger generations. This statement is written based on my several semesters’ teaching experience in University of Delaware.

I believe any class, at the very least, has to be well-organized and well-prepared. I always go through the whole lecture once before class to make sure all technical details are correct to save embarrassment on my part and confusion on the students’ part. I usually start a class with a brief review of the previous class and end with a summary of this class. In the middle, I arrange the material in logical order so as to maximize its absorption. I try to approach each new idea in a manner as natural as possible so the students won’t be overwhelmed and give up too soon.

I try to strike a balance between engaging students and completing teaching objectives. On one hand, I believe interaction with students is essential to effective teaching, which is the added value of coming to class compared to reading the textbook on their own. I like to get students to come up with the idea on their own. To achieve this, I divide big theorems into small steps and help them make the leap by asking leading questions which draw on what they already know. Their confidence is boosted if they can get the answer. These questions also serve as a perfect opportunity to probe my students’ level of understanding. I adjust my pace according to their responses. If they are stuck or hold some misconception, I will slow down and help them consolidate what they have learnt. Sometimes I intentionally make mistakes on the board and ask students to correct me. This temporary reversal of the teacher-student role induces students to reflect upon their own work. On the other hand, class time is a limited resource that needs management. Excessive interaction with students not only slows the teaching progress but also tends to bore top students. Only highlights of each lecture deserve such treatment.

I like to present materials from different perspectives. Most of my students are business or engineering majors so abstract formula rarely appeals to them while neat applications related to their major sometimes resonate with them. Whenever possible, I provide one or two real life applications to motivate the students less than inspired by maths itself to understand the dry concepts better. I like to teach different ways of solving the same problem. For example, I always teach the example to which both the shell method and washer method can be applied. It is more effective than teaching the two methods separately because students can better comprehend the applicability of each method. I also like to “mix up” the concepts we are going through and those we have learnt several weeks ago so that the students can keep aware of the connection between different parts of the textbook knowledge.

One thing I particularly encourage students to do is “break things”. Each theorem or numerical method has its own scope. In which case will they fail? From time to time
I assign a homework question with bonus points for students to have some fun. The question is designed to put a spotlight on the hidden assumptions. It prompts them to think critically and creatively, which lies at the heart of scientific research. Instead of drilling students to take tests, this is the part that they are encouraged to take an active role in learning and do a little bit exploration. I believe most students can only be as good as the instructor’s expectation. If we think of our students as test-taking machines, that is what they are going to become. But if we ask students to jump and reach for a hard problem, they will learn a lot in the process of dealing with the challenge.

I believe homework and office hour are indispensable to learning. Class time is limited and constitutes only the tip of the iceberg of learning. I know from my own experience that it is by “doing”, not “listening” that I learn maths. Usually the time spent outside class is when the students really learn. I assign homework judiciously so that it, on one hand, forces students to recall the concepts and on the other hand, exposes students to common pitfalls. Office hour is especially important because this is the only time one can truly communicate with students on individual levels. Students have different ways and levels of understanding even though they are taught in the same class. More often than not, they make their own mistakes which are not a problem for the rest of the class. To treat them in class is a waste of time while the office hour provides the ideal opportunity. I get satisfaction in improving some student’s grades greatly just by pointing out one or two of his misunderstandings.

I enjoy using technology in my teaching. The advanced calculus class often involves materials hard to present on a static blackboard. For example, the picture soon deteriorates to a bunch of tangled lines into the third step of Newton’s method. A clear presentation of revolutions in 3 dimension requires a little too much artistic skills. With the help of CAS software, not only can I draw everything as clearly as I want but the students appreciate the learning process more when they can get their hands on the objects they are dealing with. However I believe technology is not a panacea. Writing on board gives students time to think. The technology is quite powerless when it comes to teaching mathematics techniques like integration by parts or trigonometric substitution.

All in all, I like teaching a lot. I admit I may have made a mistake here or there but teaching has a learning curve. I am willing to try different teaching techniques to cater to my students’ need.