

TEACHING STATEMENT

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My first thought of teaching would trace back to spring 2009. It was my first year in college, and I took a linear algebra course taught by Prof. S.C. Wong. He had very strict rules in class: he would lock the door when the class starts, and if you disturb others he would ask you out. However, despite all the rules, to most of us he was the best math teacher we ever had. He doesn't repeat the book like other lecturers, instead he wrote his own lecture notes with better proofs, more examples and new applications. He was very enthusiastic, and when he came across to an elegant proof he would become really excited and dance in front of us. He was respectful to everyone, you could ask him anything math-related in class and he would answer you patiently. Sometimes the time is limited, and he would record your email and write you back in details later after class. I had never thought that time could actually fly in a math class. When he stands before the blackboard, you can see that there is a flame in his eyes. It was the time I thought teaching math is so cool, and it was also the time I found my real interest and devote myself to mathematics.

Prof. Wong sets me an example, and I have been working towards that way. My first experience of 'teaching' should be at the seminars organized by him. The seminars were for interested undergraduate students to read some geometry and topology books outside class. The seminar was run by us, and we took turns to go up and lecture others. Two years seminar experience taught me two important things: how to organize your lectures, and how to write your boardwork.

The lectures in the seminar were based on certain sections from the book, and some of them were not related well. So in order to make your lecture coherent, you need to glue them together by adding your own understanding, or sometimes you need to reverse the order of materials. I believe that a good lecture should be smooth, that the students would keep up with your logic. I usually start the lecture with a brief introduction, listing several important concepts as big dots on board, and then put details into them in order. Also, the big dots should be connected, either by illustrations or by examples showing why the previous dot induces the latter one, and what role it plays in the latter one. Math knowledge are always given in pieces, and are very easy to forget if you don't use them. The best way for the students to learn is to know which are the core ones that should be remembered firmly, and how to reach the other branch ones from the core. The students can't do it by themselves, so it's the lecturer's job to show them the logic chain that glue the knowledge together. I have done experiments on myself, and I know that a good logic chain will benefit so much, either to shorten the review and practice time massively, or to remember the formulas more firmly during the tests.

The boardwork is also a very important complement. Keeping a clean and well organized board would help the students so much in class. It happens very often that you are lost in a math class, and you are busy taking notes and don't have time to ask questions. Also, sometimes you don't hear your lecturer well, and you miss some important steps. The only thing you can count on now is what the lecturer writes on board. I usually separate the board into several parts based on the material, so the students won't mix them up. I also try to keep my notes on board as long as possible, so that the students would be able to trace back to the previous problems. If I have to make room for new materials I will erase from the oldest section. For really important concepts like theorems or main formulas, I will color and circle them and leave them on board unless we are done with them. Also I try to use explicit symbols to denote different materials, for examples, when I introduce a definition I will start with a big 'Defn', when I am working on a problem I will use arrows and lines to indicate the logic chain, and put a 'QED' when I am finished. I will use color chalks when the steps or the ideas are important. Such habits do help, and I received many student's positive comments on my boardwork.

My formal teaching experience started in spring 2014 at Florida State University, and I started teaching

PreCalculus. I have been teaching PreCalculus solo and doing recitation for Calculus I until spring 2016. Starting Summer 2016 I have been teaching Calculus III solo for two semesters, and linear algebra for one semester. I am now teaching PreCalculus and being the senior mentor for the TA's teaching the course for the first time. The teaching experience was precious, and I learned huge from it.

As an international TA, the first problem I had was the accent that made myself hard to understand. Also, since English is my second language, sometimes I can't find a precise word to express myself I spent almost a year to get the problem solved. I slowed my speaking speed a lot. I tried to feel a pause between the words jumping out of my mouth, and I use the pause to prepare my tongue. Also, I observed other lecturers' class in FSU, and watched several online courses to take notes on how the professionals explain themselves for some knowledge points. I still have an accent now, but it's not the problem anymore. Some students found it funny and imitate after class, but at least they can understand me very well.

The second problem I have improved a lot is the way I lecture. I used to lecture too much and didn't involve the students into the class. It's bad because the student are only taking notes and it could bore them easily. Also you won't see the students' reactions and you don't know that they are not understanding until you see their grades. Now unless I am writing necessary notes, I spent most of the time watching them and making eye contacts. I use that to observe how that are understanding the materials, and think whether I should change a way to explain, or I should illustrate one more example. To get them involved into class, I will also give some practice in class to have them work on, and give them hint if I find them stuck somewhere. Sometimes they will come with different answers, and it's a good time to let them debate a little bit, before I reveal the right answer. To make sure that they are understanding, enough eye contacts is necessary. The students could be shy, so when you ask them whether they are understanding they will say yes, but when you look them into the eyes you can see the true answer. Also, making eye contacts could draw near the lecturer and the students, and get the students more engaged by the feeling the lecturer is watching them.

People always say that mathematics is hard, and treat math like a monster. I believe that math is indeed not easy, but for most of them, once they can concentrate in the class and guided in the right way, the fundamental undergraduate course is not a hard task. The best way to get them engaged is to inspire their interest in mathematics, or at least make them feel that it's not horrible. One thing I have been working on is to illustrate math using daily language, and use graphs and metaphors to make the knowledge easier to understand and remember. For instance, in PreCalculus, there is one theorem called the rational zero theorem, which gives a list of possible zeros of a integer-coefficients polynomial. The theorem requires the students to take all the possible factors of the leading coefficient and the constant term, then take all possible ratios. Most students found the theorem had to remember, and it's very easy to mess the order of the ratio. So in class I told them to think the polynomial as a snake, while the leading term is the head and the constant term is the nail, then the ratio is just a handstand snake: the nail over the head. It turns out to be effective: in the following test they all got that problem right.

Also the students need certain courage from the lecturer. For some of the students who just come to college, they are not ready for college math, or haven't learned the right way. They may behave very pool in the first test, so the lecturer should comfort them and encourage them to give another try. I usually encourage my students to come to my office discussing their quiz and test, and I will sit down with the students going through their quiz and test, give advises on test skills and help them on studying more effectively. I will also write back to the students a couple weeks later to follow up, and if they are still struggling I will talk to them and try to find other ways to improve their grade. There was one student named Fara, she almost failed the first test, but we talked a lot after that, and she came to me every week discussing her study, then she made a huge comeback in the final, she scored the only 100 in my class. It was one of the very moments that I feel really happy and proud

of being a math teacher.

To me, mathematics is mysterious, elegant, and fantastic. The more I dig into it, the more I found it unbelievably beautiful. I inherit the passion and love for mathematics from my mentor Prof. Wong, and I wish that I could pass it to the next generation. I am on the road to an awesome math teacher, and I will keep improving and evolving.