

Teaching Statement

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My diverse experiences, ranging from large-scale teaching to small classroom recitations, allow me to constantly reflect on different aspects of my teaching and continue to grow as a teacher. In my perspective, the role of a lecturer resembles **a guide on students' intellectual journey**. As a result, I strive to give effective lectures, create a safe learning environment, and make students genuinely excited to learn. I found the following comments from my students in discrete math to be a good illustration of my teaching style:

"Yining was very well organized, approachable, and enthusiastic. She did a great job not only with examples and lectures, but with making us a template for lecture notes beforehand, helping organize the way that we ask questions during lectures, and being friendly and kind when people did not understand material. Made the course so much fun."

In the following statement, I will describe my perspectives on key components of running successful CS courses.

Effective lectures

When I serve as the primary instructor of the course, my top priority is giving effective lectures. I found it essential to help students see the big picture of the subject. To achieve this goal, I always provide context at the beginning of the lecture on how each lecture relates to previous lectures. This helps students to connect what they learn in lectures to a web of knowledge instead of disconnected concepts.

Moreover, I found that students gain more from lectures if they have some expectation of what will be covered in each upcoming lecture. To better help students mentally prepare before class, I always provide lecture templates the day before a given lecture. On the template, I would use headers to break down the lecture into different sections; within each section, definitions, algorithms, examples, and remarks are partially written. During the live lecture, students would use the template to fill in the notes, while I used the same template to present the material. Based on the feedback, students found the lecture format to be effective:

"Yining's notes were very detailed and to the point, so it was easy to understand within the relatively short amount of time; Yining's lectures were very colorful and interesting. I felt like I knew what was important, and that the content was highlighted in front of me."

Safe learning environment

First, I make myself available to students. On top of the weekly drop-in office hours, I encourage students to talk to me after the lecture if there is anything course-related they would like to discuss. By doing so, I found that students feel comfortable asking me questions not only about the course itself but also about extracurricular activities, such as future course advice and graduate school advice.

Second, when I work with students, I would guide them instead of pushing them to a conclusion. When a student comes to office hours asking for help on an assignment, I would first ask them what they have tried; after hearing their attempts, I would identify the concepts related to their question. Then, I would review the concepts with them and ask them if they see the connection between the concepts and the problem. Oftentimes, I would also present an easier version of the problem to help them see the connection. The goal is to have the student come up with the solution themselves at the end. Even though this way of helping students takes a significant amount of time compared to simply presenting the solution, I found the time spent is extremely valuable, as indicated by the following students' comments:

"I felt like Yining genuinely cared about us, and I saw her putting in the effort; I owe so much of my understanding in this course to her, the fact that she is willing to stay so long after discussion just to make sure everyone asks their questions is amazing; Working with Yining in office hours is really helpful because she is so welcoming to questions and encourages participation of the students in office hours."

Make students excited to learn

As someone passionate about the subject they teach, it is my ultimate goal to have a long-term impact on the students by making them excited to learn. As a result, I constantly reflect on what brought me into the subject; often, they are exciting applications and unintuitive results, and I try my best to incorporate them into my lectures. For example, when I taught discrete math at Columbia, I presented a list of questions during the first lecture and asked students to vote for an answer anonymously. All of the questions are ones I found the answer to be surprising when I was a student in discrete math. For example, "Are there infinities 'bigger' than the others?" and "How many people do you need so that the probability of some pair of them sharing the same birthday exceeds 50%?" Using those questions as teasers, students are excited to start the learning journey.

I found that a significant challenge to teaching math to CS majors is that the abstract concept can seem a bit dry, and hence, students might lack the motivation to master the concepts. To overcome this challenge, another strategy I incorporate to make learning more fun is to always provide concrete analogies after introducing an abstract concept. For example, I found that

students had difficulty understanding different properties of a function, such as injectivity and surjectivity, because the way most resources present it is filled with notations. When I gave the lecture on functions as the instructor, I emphasized that a good analogy is thinking about elements in the domain as balls, elements in the codomain as boxes, and a function as a way of putting balls into boxes. Under this analogy, an injection means each box has at most one ball, and a surjection means there are no empty boxes. I found that such concrete analogies help students develop a better intuition of the subject and, as a result, build more confidence in students, making them excited to learn. The following excerpt from my students' feedback illustrates the effect of my strategy:

"Yining clearly enjoys the content she teaches and that really reflected in her enthusiasm during lecture, which made learning it a lot more enjoyable for me; legit never been this excited for math; Just that Yining is a great teacher and makes me excited about the material! Her excitement for the material and way that she presents makes it very enjoyable to learn how to apply these concepts. "

Conclusion

Throughout my learning journey, I have been extremely fortunate to have many exceptional teachers who have guided me to discover the joy of learning; through them, I see how much positive impact a teacher can have on a student. Therefore, I strive to become the best teacher I can be – through giving effective lectures, being available to students, and sharing my passion for the subject with them. I am excited to guide more and more students on their intellectual journey.