Statement on Teaching Philosophy and Experience

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Philosophy

My teaching philosophy can be best understood as fighting against the metaphor “you can lead a horse to water, but you can’t make it drink.” That is, I firmly believe that student success and motivation in class are strongly influenced by the instructor. Do the students feel safe to ask “dumb” questions? Do they feel the course examinations are fair? Do they see the course as connecting to their broader career goals? All of these factors are largely in instructor control!

Here’s how I deal with the above questions: How do students feel safe asking “dumb” questions? I thank them for every question. How do they know the examinations are fair? I post learning outcomes directly on the course syllabus, create exams that directly measure these outcomes, and design homeworks and practice exams to practice these outcomes. How do they see the course as relevant? I ask them what their career goals are and explicitly give relevant applications. These applications have included going over problems from actuarial exams, explaining the relationship between linear algebra and statistical regression, and giving an overview of public-key encryption.

My overall goal is to empower students. I work to get them to see themselves as part of the mathematical community and to see the role of mathematics in their lives. I learn their names, I tailor my classes to their interests and backgrounds, and I regularly ask for anonymous feedback on how to improve their learning experience. I also regularly attend teaching workshops so that I can employ evidence-based practices driven by the principles of equity, diversity, and inclusion.

Experiences

• Served as a Teaching Assistant for 19 classes, conducting weekly 50-minute discussion sections, holding office hours, grading quizzes, grading homework, and grading exams

• Served as the primary instructor for 2 classes, conducting three 50-minute lectures per week, holding office hours, creating homeworks and exams, and grading exams (more details below)

• Served three times as a co-instructor for the introductory pedagogy class for new teaching assistants (more details below)

• Served two quarters as a mentor in the Directed Reading Program (DRP) at UCLA

• Served on the math department’s teaching committee Fall 2020-present, helping revise the TA handbook, developing holistic criteria for departmental teaching awards, and voting on awards for postdocs and ladder faculty.
Inquiry Based Learning

In Winter 2021, I was the instructor for Math 11N, an introductory course to number theory using Inquiry Based Learning (IBL). The central conceit of the course is that the instructor presents definitions and theorem statements and that the students prove the theorems for homework and volunteer to present them during the following class, after which the other students would give feedback. These proofs are then added to a class textbook that starts with proofs omitted. This is all done to allow the students to take ownership of their mathematics and realize that math isn’t just wisdom handed down from their elders.

I taught this course via Zoom, which had never been done before at UCLA, and I had to adapt the format. In particular, about a third of the class lived in East Asia and was unable to attend the thrice-weekly live lectures. To enable these students to participate asynchronously, I gave all students the options to present their proofs (and receive feedback) via a forum on UCLA’s course management system. This also made the experience more equitable for students who still could attend live, as many of them were not always in situations where they could comfortably share their audio or video.

The main goal of this course, aimed at first- and second-year students, is to build mathematical maturity. For this, I trained the students to be comfortable working on problems despite not immediately knowing the answer. When I assigned theorems at the end of each lecture, I required the students to submit work that reflected at least 30 minutes effort toward proving the theorems, whether they finished or not. (This was in addition to weekly homework sets designed to have every problem completed.) To see if this was effective, I asked them, on the last homework, “Of all the things you learned/did this quarter, what are you most proud of?” Most of the students, without prompting, said they were most proud of their newfound ability to handle challenging proofs. Many of them also reported learning much more than they did in their other math classes!

Pedagogy Training for New Teaching Assistants

In Fall 2019, 2020, and 2021, I have co-taught Math 495, the introductory pedagogy course for new TAs. Prior to each of these, I attended a 20-hour workshop/academy on inclusive pedagogy offered by UCLA’s Center for the Advancement of Teaching (CAT). In Math 495, we covered topics such as lesson planning, creating fair and efficient rubrics, creating inclusive learning communities, and developing strategies for assessing teaching effectiveness.

Assignments we gave for these purposes include: designing weekly lesson plans, observing their instructor, observing an experience TA, recording themselves to self-reflect, implementing active learning strategies, sending anonymous feedback forms to their students, drafting responses to common proctoring scenarios, and attending an inclusive classrooms workshop. In Fall 2019, we arranged for the international students office to give a workshop on pronouncing Chinese names, which was opened to the entire department.

Aside from the assignments, our main strategy to teach the new TAs was to model excellent teaching ourselves. We shared our lesson plans, to help them make theirs. We used the active learning strategies of wait time, think-pair-share, many hands, polling, and open questions so that
they could see how to implement them in their own classrooms. And we built an inclusive learning community (by creating community expectations, setting aside time for “burning” questions, and using Slack for out-of-class communication/collaboration) so they could see how to make those learning communities themselves.

The TAs that have taken Math 495 while I was a co-instructor now represent a majority of Math TAs at UCLA. I’m deeply proud of how they’ve grown and of how many of them put in the effort to implement active learning and other student-focused learning techniques. Frankly, it wasn’t like this when I started out as a TA.

Conclusion

I see teaching as an integral part of my professional life. I believe that mathematics is a universal activity, something that make us human. For many students, doing math means overcoming the trauma and isolation of their previous mathematical experiences. Too many have been taught that one either is a ”math person,” or one isn’t. But it doesn’t have to be that way. I strive to bring out the mathematical excellence in all my students and create a place where all of them can thrive.