

Teaching Statement

David J. Malan
malan@harvard.edu

My views on teaching have crystalized over time. When I first began, I'm not sure I had an overarching philosophy. Instincts and my own past experiences as a student alone guided my pedagogical decisions. But I was sensitized early on, by way of teaching at DCE and Franklin High School, to students “less comfortable,” for whom some subject did not come easily. And over time, patterns among my pedagogical decisions emerged, perhaps informed by my own doctoral research, which focused on detection of patterns in large (albeit very different!) datasets. Ever since, I daresay three principles guide my teaching: accessibility, rigor, and community. These are particularly manifest in CS50, given its size, but they also characterize my teaching at DCE, HBS, and beyond.

1 Accessibility

It's important that introductory courses be accessible, which is not to say easy but, rather, within academic reach of all students, irrespective of prior background or lack thereof. Quite often do introductory courses serve multiple audiences: non-majors for whom the course will be terminal, their only exposure to a field, and majors for whom the course is a gateway to higher-level studies. Barriers to entry serve neither demographic. If the on-ramp to a course is too steep, with the course assuming too much prior knowledge or accelerating too quickly without an adequate support structure for those less comfortable, non-majors might steer clear altogether and even prospective majors might veer off their initial trajectory. In both cases is our field poorer for it, with fewer of its ideas in the wild and fewer scholars trained to apply its lessons to their field or ours.

While it might be tempting to offer each demographic its own on-ramp, as by offering one course for non-majors and another for majors, such an early fork in the road forces students to choose a priori their destination, even before many have any experience based on which to make an informed decision. A premature fork risks creation of a class of students who assume they do not belong in the other.

It's for precisely this reason that we continue to keep students less comfortable and more comfortable alike in CS50 and provide for the former especially a robust support structure so that all students, irrespective of prior background or lack thereof, can succeed, provided they avail themselves of those resources. And it's for this same reason that we encourage so many students to take the course SAT/UNS so as to explore an unfamiliar field without fear of “failure.” Indeed, it was primarily because of that option (formerly implemented as Pass/Fail) that I myself enrolled the course so many years ago.

2 Rigor

Accessibility and rigor, though, are not mutually exclusive. In CS50, for instance, we expect no less of those less comfortable than we do of those more comfortable. Indeed, among General Education courses in the sciences alone, wherein workloads average just 4–5 hours per week, CS50 expects upwards of 12 hours per week of most students. But that rigor is made possible via the course’s support structure, which includes 41 teaching fellows, 41 course assistants, weekly sections, daily office hours and, thanks to wide-ranging sleep schedules, nearly 24/7 support online. Among those sections, meanwhile, do we have different tracks for those less comfortable, those more comfortable, and those somewhere in between, tailored to each demographic’s background. And some of the course’s first several problem sets offer less-comfortable and more-comfortable variants of problems. While both assess students’ mastery of similar material, one offers a lower floor and the other a higher ceiling. Students are free to choose one or the other (or both) for equivalent credit but are encouraged to reach higher as the semester progresses.

By scaffolding a course in this way, with training wheels on at term’s start and off after distances that vary among students, students’ progress can be measured vis-à-vis students’ own starting points, with the course’s rigor thus relative. Per CS50’s own syllabus, “what ultimately matters in this course is not so much where you end up relative to your classmates but where you, in Week 11, end up relative to yourself in Week 0.” On display at each CS50 Fair, meanwhile, is the result of taking those training wheels off. Via final projects do students ultimately learn how to teach themselves something new, without any specification from us. Indeed, at term’s end, a successful outcome is when students have learned something that we did not teach them.

3 Community

Perhaps most underappreciated in higher education is the opportunity to transform courses themselves into communities, each with its own culture and norms, a shared experience wherein students collectively struggle and, with the right support structure, succeed. Indeed, a course needn’t be just a course. It can instead be its own support network wherein students know (and are reminded) that they have classmates, just as uncomfortable as they, on whom they can lean as they progress together toward the finish line. Indeed, most every outward manifestation of CS50, including its t-shirts and stress balls, its lunches and office hours, its hackathon and fair, is intended to instill a sense of community and, in turn, collective accomplishment. It’s for this reason, too, that CS50’s t-shirts say at term’s end, simply and proudly, “I took CS50.”