

My experience in teaching began in high school and college when I was a regular volunteer teacher at centers for out-of-school youth and low-income communities in the Philippines to teach English, mathematics, and the use of computing applications. I taught learners from a diverse set of backgrounds — children and adults without any formal schooling, juvenile delinquents, homeless, people who have dropped out of school due to financial constraints, victims of abuse, and many others. My experience in teaching people with diverse needs and the constraints that I worked with teaching within these contexts have taught me meaningful lessons around engaging thoughtfully with learners, being aware of their needs, and how to integrate the accommodation of these needs with instructional material and pedagogical practice to create an enriching and inclusive learning environment. These experiences shaped my practice as an educator early on and I continue to draw on these early experiences in my teaching engagements.

Contextualizing CS-Learning Within Students' Communities of Practice

As an instructor at the University of the Philippines Los Baños (UPLB), I taught CS courses that served both CS and non-CS majors. One of these was CMSC22, a course on object-oriented programming, where I taught a total of roughly 90-100 students per semester. When I taught the course, I wanted to address a feedback from students on past iterations of the course that the lab activities felt like disconnected learning experiences and lacked a cohesive element that integrated concepts together intentionally. To address this, I redesigned the lab exercises so that each exercise was a sub-component of a larger project towards the end of the course. The exercises thus served not only to teach concepts, but provided a **concrete way to bridge together concepts** by iteratively building and connecting sub-parts of a bigger project.

Because the course is taken by both CS and non-CS majors (for example, communication, statistics, and engineering) one of my goals was also to develop the lab exercises in a way that **contextualizes students' learning experience within their own communities of practice**. Towards the end of the course, I invited the students to adapt or re-conceptualize their final project in a way that expresses how they might use them in their own fields. I directly guided students in doing this and helped them develop ideas from their current field-knowledge. This resulted in final projects in the form of games, simulations, statistical matchmaking applications, and many others. Students showcased their projects in a class-wide exhibit where they could explore, provide feedback, and play around with their classmates' work. Students reported, both personally and in course evaluations, that **they enjoyed and felt engaged with their lab projects**. They were proud of the work they were able to achieve at the end of the course and **felt connected to their learning experience** because they were able to **apply the course concepts to a concrete application within their own fields of practice**.

Because of the positive feedback from this course, I replicated and adapted these activities in another course I taught, CMSC2, a course on introductory web development. The course also had a very diverse set of student majors attending and I taught about 100-150 students per semester. Students' exercises also built towards a final project, which they adapted to their respective fields of practice. A fascinating output from this experience was that some students actually created and deployed web projects that served as part of projects in their other courses for the semester; for example, some communication majors used their web projects as a tool to aggregate and present information that they collected from their survey respondents. The lab work thus provided them a venue to concretely and productively **enrich their learning experiences within their own domain**.

Broadening Participation in Computing in the Practice of Public Health Informatics

At the Ateneo de Manila University (ADMU), I taught CS187.1, a course on public health informatics taken by mostly pre-medicine majors (about 30-40 students per semester). In this course, I used learning activities that promote regular feedback. I gave weekly quizzes for the students to have a gauge of their own progress in class. I would also hold group case-studies in class during which students discussed with their peers about the design and use of computing or technology-based solutions in community and public healthcare. This activity provided a **venue for peer learning and feedback** in students' sharing of ideas. It also provided a venue for students to **think about the broadening of participation**

in computing, particularly in the application of healthcare technologies in communities within the Philippine context. These cover factors around end-users' exposure to computing or computing education, constraints around the deployment of healthcare technologies in low-income communities, and how students might consider these factors in the design of technology-based healthcare solutions or the training of end-users in utilizing these solutions. This draws from my earlier teaching experience with low-income and marginalized communities.

In their feedback about the course, students mentioned that beyond learning about how to use and apply computing in healthcare, computing itself gained a more "human sense". In addition to thinking about how to design and use technology to aid their practice, they also needed to consider how the tools they introduce changes the dynamics of their interactions with receivers of their practice. Students also recommended that a future iteration of the course may involve students participating in an "on-site" interaction with the communities they discussed during the case studies. I like this feedback for two reasons — one, it suggests that the learning experience **encouraged the students to immerse themselves further in extending their practice to real-world communities**, which they would likely encounter in their future profession; second, it opens an opportunity for me to further develop such a course in the future that is based on students' concrete and meaningful experiential feedback.

Teaching Assistant at WPI

In the first year of my PhD program at WPI, I was a graduate teaching assistant for the CS1 and CS2 courses (about 150 students per semester), for which I held office hours, supervised lab activities, and coordinated the grading assignments of the undergraduate TAs for the courses. I would hold what I called "mini-classes" during my office hours wherein I invite students to identify examples or concepts discussed in the course lecture or labs for which they expressed having a difficult time understanding. Students went to these mini-classes and I would provide detailed and paced walkthroughs of the material they identified, such as step-by-step walkthroughs of program-design. I particularly invited students to ask questions as much as they needed to, at points where they feel they needed clarification or reiteration. Based on feedback from the students, the more focused nature of these mini-classes particularly **helped students who were struggling during the course, as well as those who expressed difficulty asking questions or raising concerns in large-lecture setups**, especially international students and non-CS majors. I was awarded by the WPI CS department **Teaching Assistant of the Year** during my term as a graduate TA.

Mentorship

Mentoring both undergraduate and graduate CS students has been a rewarding experience; it has been fulfilling for me to see students take on fruitful career paths beyond their successful work. At UPLB, I worked closely with a CS undergraduate student working on a crowd dynamics simulation capstone project (one of my earlier research areas); he has since graduated and obtained a position at Web3, a tech company in Brisbane, Australia. At ADMU, I mentored a CS undergraduate student exploring novice programmer compilation behavior, whose work led to a poster being accepted to the Philippine Computing Science Congress, a top computing research conference in the Philippines; he has since proceeded to working on a CS master's degree. While at WPI, I remotely mentored a CS master's student at ADMU exploring students' programming biases for his master's thesis; he has since graduated and is currently faculty at Xavier University in the Philippines.

Summary

My experience as an educator, both in formal academic settings and in contexts of mentorship and community involvement, has shaped and continue to develop principles I adhere to in my teaching:

1. **Cultivate a culture of inclusivity.** Learners come into a learning environment with diverse backgrounds, which bring up various needs — these may be in the form of cultural differences, socioeconomic background, or the need for more integrative learning activities. We, as educators, should encourage learners to communicate to us their needs, and we in

turn should strive towards creating learning environments that are responsive to or consider these needs. This also involves **creating a community of support**, where an open and respectful communication line fosters enriching feedback both between teacher and learners, and amongst learners themselves.

2. **Develop a sense of engagement.** I have learned through my experiences that engagement comes not only in the form of students' interaction with the instructor and the learning material, but in the way that they connect their learnings to their practice. Rigor is a critical part of any instruction, but it also counts that students are able to connect to their learnings meaningfully. My students felt a connectedness to the learning environment when they were able to bring their learnings to their own communities of practice or even extend it to communities beyond their own, such as in marginalized communities.

I am prepared to continue teaching courses I have taught in the past such as CS1/2, data structures, web development, and interdisciplinary courses such as health informatics. I look forward to teaching courses related to my primary research areas such as HCI, computing education, and learning sciences.