Teaching Portfolio for the Certificate in College Teaching

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1.0 Introduction

This portfolio includes my teaching experience, philosophy, student, and personal evaluation methods. This document aims to provide a holistic view of my teaching experience both before entering Graduate School at the University of Colorado, Boulder, and the experience I have gained teaching here and working for the Graduate Teacher Program (now Center for Teaching & Learning). The purpose of this portfolio is to demonstrate that my teaching experience and pedagogical methods are developed enough to receive the *Certificate in College Teaching*. For this, my story begins multiple years before enrollment at CU. During my undergraduate degree at UC Berkeley, I helped to found the UC Berkeley Solar Decathlon Team, which unexpectedly introduced me to college and high school teaching. The purpose of this team was to design and build a net-zero energy house for a Department of Energy competition, a fundamentally multi-disciplinary and highly integrated project. As a team founder and the head of design, I helped to run a *DE-CAL*, the UC Berkeley platform for students to teach classes about a subject they are passionate about, on the topic of sustainable residential design. This was my first time "teaching" at the college undergraduate level, and an extremely high stress environment. I loved this, and proceeded to take the lead in teaching a 6-week "plug-in" course at the local high school in Richmond, California. Our competition entry was a low-income house designed and built for a Richmond, CA neighborhood, so the high school course focused on both Architectural Engineering concepts *and* gleaning input from the students about what would make a successful home in their area – what was their dream home? This experience was monumental, transitioning from a well-staffed and well-equipped university classroom to a public school in one of the poorest areas in the country. Given a short variety of experience as an educator, I began to develop and customize my own personal teaching philosophy. This was further cultivated and refined as I began work as a teaching assistant during my graduate studies at CU Boulder.

2.0 Teaching Experience

The first course I experienced at CU Boulder as a teaching assistant was AREN 2050 – *Construction and Building Materials* [See Syllabus in **Appendix**]. My responsibilities were minimal, and included holding office hours weekly along with grading weekly problem sets. During office hours I learned how to deal more intimately with student frustration with items out of my scope – assigned problems and qualitative questions with "no correct answer". I took it upon myself to ask for more – and through this was able to teach a lecture and write part of the first and most of the second midterm exam. With this, I held comprehensive review sessions [See Midterm Review in **Appendix**] and created review problems for the students. However, although this was a great introductory experience to more traditional college teaching, most students lacked a passion for the material that is more inherent to an upper division course. Through this I gained a better understanding of my own limits with inspiring interest in the material, versus helping students to find another path.

My second semester at CU, and through the following (current) academic year, I took the initiative to help develop and now teach a course that I shared a passion for with the instructor. Due to a heavy focus on large-scale, commercial and office building techniques in the AREN program, we started *Residential Design-Build* (AREN 4830-006) in collaboration with the CU Solar Decathlon team [See Syllabus in **Appendix**] . This project-based, experiential learning course has been a rollercoaster of consequential decision making that shook my entire teaching philosophy – overall helping my teaching tremendously and igniting a passion for experiential learning. The course is two parts, with the fall semester begin the *Design* portion and the spring semester the *Build*, the main objective of this class is to have students experience the physical implications of their ideas to both gain confidence in their skills and gain foresight as designers that most people do not have leaving university. This class is multi-disciplinary, while heavy on environmental design (ENVD) and architectural engineering (AREN) students, which comes with an entire set of challenges on its own. My experience with student frustration in my previous TA position with AREN 2050 helped tremendously here, as I tried to develop and teach an upper division engineering course to students who had yet to learn the foundational vocabulary

in the subject. Another challenge was the course format – 2.5 hours on Thursday night – which was beneficial for in-depth work on the subject yet unfortunate for students with long days and trouble focusing. I never lectured for more than 45 minutes continuously, and split each class three-pronged into a content, activity, and in-class work session. I only performed four of the content lectures throughout the semester, mostly facilitating activities and work sessions, and brought in guest lecturers in the field for other days. Throughout this process, I began work as a *GTP Lead TA*, which initiated more reflective thoughts about the process. I applied multiple teaching techniques from the "pedagogy toolbox" asI like to call it, that I discovered during the summer training. Performing video tape consultations not only helped other graduate teachers in the department, but aided my own growth in teaching evaluation.

3.0 Philosophy of Teaching and Learning

Teaching in the field of **Architectural Engineering** is fascinating, engaging, and difficult. The practical application of the material always lies at the confluence of qualitative and quantitative, where the physical implications are generally qualitative with a quantitative background of informed decision making. In my personal experience, early courses in this field involve managing student distress with the unknown "correct answer", and later courses in this field involve finality, decision making, and supporting your decisions through adversity. With this, my personal teaching philosophy is grounded in equity, variety of experience, and consequence. With *equity*, I try to consistently re-evaluate my personal privilege. I am grateful for the positive feedback loop that brought me to where I am today – but through this I try to recognize and teach to an educational experience that I never had. I can only find this through consistent self-evaluation – public and private modes for students to voice their concerns consistently throughout the semester. I try to engage different sections of the classroom and different demographics in the classroom, not judge, but think critically about the possibility of age, gender, or culture-based factors in the classroom. With *variety of experience*, I try to implement techniques for multiple learning styles. In the course I had the opportunity to develop, I used lecture, group work, and collaborative learning techniques **daily**. Part of this ability was because of our 2.5 hour time period. Through my own personal experience in other

classes, I tried to limit the amount of material, yet really solidify each concept. Each topic was given at least 45 minutes of lecture, a 30 minute activity, and a short homework assignment. I was proud to notice the increase of vocabulary and competence as students applied these concepts from class in the major design project. With *consequence*, I am excited for the spring semester in which this will all translate to group work and field work – where students have the opportunity to build what they designed last semester for a *real* client in Fraser, Colorado. This will be a project they never forget, and will be able to visit throughout their lives or add to their portfolio as they graduate. I reflect on a similar project from my undergraduate degree, in which learning consequence as a designer and engineer furthered my experience. Our industry is highly divided, and with this comes a severe disconnect. I feel that learning consequence in design increases the value of a designer and engineer significantly – for they gain invaluable skills in integration.

This philosophy has driven my syllabus and course development – for using the time allotted to provide a *variety of experience* was important to me. I think about *equity* each time I step into the classroom, and more intimately with group assignments, weekly activities, and participation. I made sure to include public and private teacher evaluations throughout the semester (as early as 2 weeks in), as well as private evaluations for group work to make sure that students are happy and collaborating – beneath the narrative they may display in the classroom. Another narrative that has driven my teaching philosophy this past semester (Fall 2019) is what I like to refer to as the “engineering hubris”. I agree that people learn with a multitude of styles and absorb information differently, but I do subscribe to the idea that engineering is a field inherently achievable by a select few. While if there is no *interest* in the subject matter, I lose steam, but one in the field of architectural engineering finds themselves consistently merging content from “Architects” and “Engineers”. Although not completely successful over the course of a 16-week class, I have tried to dispel the idea that the architects in the class held – that they could not perform high level calculations and use engineering software to solve problems. The idea was to build a strong base in vocabulary, and teach based on interest – while providing a motivation for both architects to learn engineering concepts and

vice versa. This was challenging, largely unsuccessful, and absolutely a work in progress. However, it is not something that I have given up in my teaching philosophy, and I will be taking an online course offered by the *Center for Teaching & Learning as well as the Center for the Integration of Research, Teaching and Learning* called "Advanced Learning Through Evidence-Based STEM Teaching" that will hopefully strengthen my skillset in bridging this gap.

4.0 Assessment and Evaluation of Student and Teacher Learning

Throughout my teaching experience, especially as a more formal experience here at CU (paid TA graduate assistantship), I have both developed and learned to appreciate assessment of student learning and teaching effectiveness in a way that I had never realized as a student myself. As a TA for AREN 2050, I had no choice in summative student assessment – where weekly problem sets, a final project, and exams were utilized for assessment. For formative assessments, I used the exit ticket method with the "muddiest" point to gain feedback on my lecture, and responsiveness to my exam review posting. For my "Residential Design-Build" course this semester, I have near infinite more freedom, and experimented with multiple flavors of assessment. For students, I used summative assessments in the form of consistent weekly assignments [See Example Assignment in **Appendix**] to solidify each concept, project reports, and project presentations. All group presentations had a peer review portion (submitted to me privately), and students were graded based on both their individual and group work – given that a large part of this class is project-based learning [See Example Rubric in **Appendix**]. Formative assessments included engagement, written and online course surveys, and constant personal check-ins via dialogue. The course was only 20 students, thus I was able to more or less keep tabs individually on student progress. As an instructor, I used feedback from these consistent dialogues and advice from the sponsoring instructor to drive and change the class. I tried to introduce technology via iClicker questions, but this was obviously unsuccessful – where the "SmartGrader" function for commenting on Canvas homework assignments was both convenient and successful. Course surveys [See Example Question in **Appendix**] also served as an additional tool for receiving feedback, although most of the feedback echoed the conversations I had previously in the classroom. I performed my second

video-tape consultation this semester where we explored teacher interactions – questions asked, received, wasted time, etc.… - and I was extremely satisfied with the process [See Second VTC in **Appendix**]. As a Lead TA for the CEAE department, my video-tape consultations with other graduate student teachers consistently serves as a reflective time for myself and my own teaching. Intentional conversations with a variety of other graduate teachers broadened my perspective of *how we view our students*, which seemed closely associated with the graduate teacher's perspective on summative assessments (*i.e.,* teachers that did not think students were interested in the material tended to lean on more summative assessments to hold people accountable). Formative style assessments gave insight into *how our students view us*, and ultimately *how we view ourselves* as instructors. I was never surprised by student responses to survey-style assessments – but the most impactful formative moments were in-class activities. Motivation, or lack-thereof, when activities and assignments are not graded for quality, was more consequential to my personal confidence as a teacher. I tried often to leverage in-class activity as a tool for gauging interest in the material and effectiveness of each lecture.

5.0 Diversity Statement

My scholarship, teaching, and service as an graduate student instructor aim to contribute to a more diverse community of students and the idea of inclusive excellence both in and out of the classroom. *Diversity of voice* in the classroom from both the students and instructor was a major tool for creating a more inclusive classroom. Guest lecturers for *Residential Design-Build* were chosen based on both their expertise and diversity of gender, culture, age, and experience. As the graduate student instructor for the course, I was lecturing in front of the class less than 50% of the time – usually taking the facilitator role for each guest lecturer. After my second videotape consultation, I made a more concerted effort to address the lack of equity in interaction (less questions coming from certain parts of the room), especially when I was facilitating these guest lectures and able to observe the classroom in more detail. More subtle, I of course included the necessary diversity statements in my syllabus as well as gave students multiple layers of reminders for important dates, concepts, and assignments. These

were posted online, outlined in the syllabus, and mentioned each course period with learning objectives. The clarity of assignment design improved over time, and with feedback, while sometimes the returned assignments themselves were quick indicators of language that large groups of students did not understand. I offered case-by-case extra credit for students struggling, in order to not penalize a particularly rough week with the presence of distracting personal issues. What I noticed was the most impactful, was a dual interaction with the instructor of record. Between the two of us, we were able to field a more diverse spectrum of classroom issues while also displaying a *diversity of voice* in our teacher problem solving.

More specifically to the field of Architectural Engineering, another mode in which I address inclusive excellence was described above as the *distinction* between architect and engineer. I strive to eliminate condescension and inspire confidence in **both** fields for **all** students. This contributes to a more diverse, more capable sector of sustainable building design. More broadly, I am consistently evaluating the privilege I have received throughout my academic career. Through this, I am able to choose more inclusive language and classroom presence. Ultimately, using the educational and formative tools provided by the *Center for Teaching & Learning* will help to further my inclusive pedagogy and improve my teaching style for inclusive excellence in the students.