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GAANN Teaching Report
Spring 2020

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Summary

Spring 2020

I have completed the goals for the semester: Attend a CTL lecture, complete the Teaching Seminar, conduct problem sessions, continue learning about learning management systems, and added to my teaching portfolio in the form of reflecting on activities documented below.

Fall 2019

I have completed the goals for the semester: Attend a CTL lecture, complete the Teaching Seminar, start a teaching portfolio including a teaching philosophy, documented below.

Teaching Philosophy

Since my recent experiences with teaching have revolved around design courses or courses that focus more on the application of computing concepts and skills, this portion / version of my teaching philosophy is most related to these sorts of classes.

My teaching philosophy revolves around the idea that an important part of learning is developing agency through making personal connections at multiple levels such as with the tools, materials, and concepts themselves as well as how to apply these in systems and in the world. Digital technology has reached an unprecedented level of ubiquity and influence on our lives. The underlying value system that governs the creation of these devices revolves around speed, utility, and immersion. While there are often elective-style classes that touch on these topics such as a Tech Ethics or specialized Design Studio, my approach is to also integrate these ideas and this type of thinking more often in other courses.

For example, AI systems are often trained on datasets from the real world. When humans in the real world make decisions, there are many hidden biases such as gender and race that influence their decisions. Building an AI on that data only reinforces those problematic power structures. Or in the field of HCI, questions about the ethics of various interaction

techniques are coming into focus as digital technology reaches an unprecedented level of influence on our well-being. For example, the infinite scroll technique, a seemingly elegant and benign alternative to making the user click a button to go to the next page, has recently been discussed as a dangerous and unsettling since it doesn't give a natural stopping point for users to decide if they are finished. As students develop the technical skills for how to implement these things, they should also develop the skills to consider how these technical skills might be applied and the implications of technical decisions.

Concepts and ideas should not be presented to students as benign; rather they should be brought into focus along with room for discussion about what they mean. This not only embeds discussion of ethics into the entire learning experience, but it also gives students the opportunity to develop literacy and voice, and thus agency over the seemingly small aspects or decisions they make in computing.

We have known for a while now that learning happens best when students are actively doing rather than passively listening. This concept has been translated into classroom techniques such as flipped classroom, project-based learning, and lightweight teams for in-class group activities. I facilitate class time drawing upon these strategies as much as possible. This gives students the opportunity to work through problems in a safe environment, learn soft skills such as working with others, and allows me to understand what the students are thinking to adjust or provide different scaffolding. I draw upon an inquiry-based learning method during flipped classroom sessions, where I ask students questions about what they are thinking and their rationale behind it. In design classes especially, students often do not think through all the possibilities and it is only through dialogue-based facilitation that I can provide feedback on their ideas in an effective way.

Each student is different, as is each population of students. Drawing from sensitivities I have developed as an HCI researcher, I anticipate that I will always be adapting teaching methods to meet the students' personalities and provide the appropriate level of scaffolding to the students I am working with. For example, in some classes I have found that students need some guidance for how to best work in a group and need scaffolding at the beginning for how to structure their in-group communication.

Overall, I hope that through giving students the opportunity for personal and unique reflection on what they are doing I can contribute to fostering a body of computing students who are thoughtful, deliberate, and mindful about the technology they are putting into the world by helping them realize that they have agency over the tools they are learning and ideas that are worthwhile.

Experiences with Teaching and Problem Sessions

Spring 2020 - ITSC 8665 (Teaching Seminar) Teaching Session

This semester, in the teaching seminar course, we each get to teach one of the sessions in pairs or groups of 3. Ahmad and I were assigned the first one, and the topic was about dealing with difficult situations. Dr. Maher gave us a suggested template for each lesson, which included lesson objectives, overview of plan, a list of things students should be able to do by the end of the lesson, any preparation materials, and the activity for in-class.

We decided that within the topic of difficult situations, we would focus on the specific difficult situation of cheating, since that is an unfortunate prevalent problem in computing right now. We searched around for literature and articles on the topic of cheating and read through some that Dr. Maher had suggested. It became clear that there were a few different facets to focus on- why cheating happens in computing, how to prevent cheating in computing, and how to address instances of cheating or suspected cheating. We assigned readings to understand these aspects.

In class, we first led a discussion about why students cheat based on the readings and based on their own perceptions of the topic. Then, most of the class was dedicated to acting out various difficult situations related to cheating and act out strategies for how to deal with them. We came up with this idea for acting things out based off the Exclusion Response workshops led by the Center for Education Initiative (CEI) in CCI for all incoming computing students. These exclusion response workshops are based off of Theatre of the Oppressed, which is a participatory theatre technique where audience members step onto stage to act out different situations might go based on their own experiences. At UNCC, the workshops are used to raise awareness of oppression students might face in computing based on gender, race, socioeconomic status, or other factors, and to equip students with strategies for how to address those situations when they arise. The acting part, which can be intimidating, gives students the opportunity to say the words out loud and get some practice in a safe space. Even if we talk about the right way to react beforehand, unless we have participated in those conversations before, we haven't really learned it fully. This is why we chose to use this technique in the Teaching Seminar for students to practice how to approach tough conversations with students and how to react when students respond in different ways.

We divided the students into groups and had them decide on a cheating situation to act out, act it out, and then switch actors to act it out in a different way. We then had some of the groups perform in front of the class and switched out the actors while discussing the situation. Some important points were brought up, for example, in one group, the "professor" had brought two "students" suspected of cheating into their "office" at the same time, but the class pointed out that it would be better to discuss with each student individually.

In the course feedback, students appreciated the acting portion, even if some were shy about acting at first. I'm not sure how forcing students to act in a normal class would go, but since this is a course for students who are preparing to be instructors, we did not feel bad putting them on the spot in front of the class. Some of the students wanted to discuss other types of difficult situations, not just cheating. I worry that if we had done this, the single class session would have been too broad and they would not have gotten much out of it. Next time, we would make sure to spend more time on the acting. We also might have given the students specific situations to act out rather than deciding on their own. Some groups got stuck deciding on a situation and we lost time. Even with encouraging them to just pick something and move forward, they kept discussing other things rather than following instructions. The downside of assigning scenarios is that students likely have situations in mind that they have questions about and if we don't explore the situations on their mind, they might not get those questions answered.

Spring 2020 - ITIS 4011/6011 Interaction Design Studio - Problem Session Support

I attended two class sessions of the Interaction Design Studio course, taught by Dr. Wilson. The majority of these class sessions were run as a semi-structured time for students to get feedback from each other and from the instructor on their ongoing semester-long projects. During these sessions, I helped with giving feedback to the students by walking around to the groups to ask about their status and answer any questions.

The class is large- about 40 students in groups of 3, when in the past the course has been less than 20 students. This means that students need to be very self-guided and self-driven to be successful. Dr. Wilson said that the students should have a relatively concrete idea of the design they will be pursuing and should be focusing on what the technological components will be so they can order them if necessary.

Each time the design studio is taught, there is a different design prompt. This semester, the prompt is to design a tangible interactive system to help with learning.

One interesting challenge for students in design courses is balancing between conceptual development and technological implementation. It is difficult to know what kinds of concepts are possible when they haven't experimented with the technology yet. And if they focus too much on the technology, they sometimes don't fully explore less obvious applications of the technology. The groups were spread out in terms of having a solid idea for the concept versus having a solid idea for the technology.

This class session was a little different from other problem sessions since there aren't correct and incorrect answers that the students are seeking. Some of the groups didn't think that they needed any help, but I asked them questions anyway and we found that there were still ways that they could develop a more concrete technological implementation plan or could refine their concept for a richer interaction or better scoped project. My strategy was to ask the students a lot of questions to understand their thinking. If there was something that seemed to need more thought or development, I would ask more questions to help the students realize it for themselves rather than just telling them the insight. This is in line with inquiry-based learning.

Fall 2019 - Guest Lecture in Rapid Prototyping and Design Patterns Class

Course Overview
The Rapid Prototyping Course is part of a suite of classes that focus on various aspects of HCI. These classes include HCI, which involves learning how to conduct a user-centered design process and what aspects of human cognition and capabilities we should be sure to consider as we design interfaces. The Interactive Systems Design and Implementation class picks up where the HCI class leaves off and focuses on web APIs and the actual building of the website. The Interaction Design Studio is a project-based course that incorporates a real world design prompt and real implementation. The rapid prototyping course re-iterates many of the design principles from the HCI course and focuses on techniques for prototyping, teaching students how to rapidly apply them towards prototypes of varying levels of fidelity using different software and approaches.

Lecture Overview
I was invited to teach the module on Physical Prototyping to the undergrad and graduate sections of the Rapid Prototyping course. Dr. Wilson wanted the unit to incorporate digital

fabrication tools such as 3D printers, though some challenges of incorporating these tools in a short module of a course is that they require skill to operate and utilize, they are slow to utilize within a class period, and we only have a limited number of them on campus for a large class of students to use outside of class. Nevertheless, there is great benefit to giving students exposure to these tools and it is worthwhile to overcome these challenges.

The module I created centered around a group activity of creating and evaluating a prototype of a tangible interactive system for learning a concept or idea of the group's choosing. The module was divided into three segments: introduction, design activity, and evaluation.

Introduction to Physical Prototyping (1 hr 15 min)
I began the class with a rapid prototyping activity: use the cardboard, legos, tape etc. on the tables to prototype a possible technology from the year 2070. Students had 10 minutes and then discussed their prototypes in groups. The goals of this activity were to 1) spark creativity and get students away from thinking just about websites 2) give students a sense of agency over the materials and the type of prototyping we would be doing that day and 3) reflect on some of the benefits and reasons why we prototype.

I then led an interactive lecture to introduce physical prototyping. I broke the concepts into two categories: physical computing, and techniques for prototyping physical technologies. Since most of the class is website and mobile app based, students needed an introduction to types of computing that had form factors beyond screens, mice, and keyboards, which I why I needed to introduce the students to fields of research and development such as Tangible Interaction, Embodied Interaction, Internet of Things, and Ubiquitous Computing. I introduced these concepts through a sketching activity that we did as a group and through reflecting on our sketches together.

Introduction to techniques for physical prototyping was lecture-based. I talked through some examples of low-fidelity prototypes made from cardboard or clay and an overview of digital fabrication technologies. I felt as though I was losing the students' attention at that point and that it was a whirlwind introduction to a lot of different ideas. In the future I might figure a different way to convey that information.

Prototyping Activity (1 hr 15 min)
The prompt for the activity was to work in groups of 5 to create a prototype of an interactive system for learning. Their prototype did not need to be fully interactive, but it needed to be a prototype of a system that would eventually have an interactive element.

They needed to use at least one of the following 5 physical prototyping techniques / machines:
- 3D printer
- Cameo paper cutter
- Sewing machine
- Makey Makey
- Manual 3D printing pen

Evaluation (1 hr 15 min)
The evaluation component involved students designing a user study that would test the extent to which the system helps the user learn what it is supposed to. Students had to first make a plan that involved pre-questions, post-questions, and a description of the task. They then conducted the evaluation with students from other teams.

Reflections
In the graduate class, students had solid ideas almost immediately and got to work prototyping. Many were using the makey makey devices and making prototypes that were actually interactive. The second most popular technology was the cameo cutters and a few were using the 3D printing pens. In the undergraduate class, some groups had a more difficult time coming up with an idea. Some of the ideas were not interactive or did not represent any novel differences from existing systems. The undergraduates were primarily using the 3D printing pens and the makey makeys. One group had a student who has prior 3D printing experience, so they 3D printed a piece for their design.

We decided to give the undergraduates another whole class period (1 hr 15 min) to finish or iterate on their prototypes. If I ran this again, I would give more time for the prototyping and scaffold the design prompt. Perhaps the students needed more examples of tangible systems for learning or could have been led towards a feasible idea with sub-prompts such as "pick an abstract concept that is difficult to learn".

Summer II 2019 - Instructor of Record for Human-Centered Design

Overview
As the instructor of record, I was responsible for creating the canvas page, setting the assignments, leading class, and communicating with the TA. The HCD class is taught regularly, so I had a few different versions of the curriculum to work with. I based it mainly off of the same version that I was TA for in 2015 since it was most familiar to me. The course introduces a number of principles to keep in mind when designing interactive

systems as well as the user-centered design process that keeps the user at the forefront at all stages of the design process.

The course was flipped classroom, where students watched video lectures to prepare, had a short quiz at the start of class on the video content, and then the rest of the class was dedicated to group activities. There was also a semester-long group project that involved designing a website or app using the user-centered design process from start to finish. Part of class time was dedicated to project work as well.

Reflections

A challenge for any summer class is that all the content is squished into a small segment of time. This made the group project challenging since students did not have much time to iterate. I found it difficult to get the students to buy in to the flipped classroom teaching method. From the quizzes, it was clear that many of them were not watching the videos. I changed the policy to allow the quizzes to be open notebook, where students could look at their notes from the videos during the quiz. Hardly any students were even taking notes on the videos.

The students responded well to feedback I gave in class. The class was small enough that I could visit each group multiple times. Often, the students did not think through their answers at first and would need prompting to go deeper. Their semester-long projects were alright. They would have had more time outside of class in a regular semester for iterations and development. Accompanying the project milestones were write-ups that justified and grounded the design decisions they made and documented their design process. I emphasized the write-ups and was explicit about what should be in there because I thought the opportunity to reflect would deepen their learning or at least make them more capable of articulating what the class is about. Part of design is the product, but another part is being aware of and intentional about all the decisions one makes along the way. Their writing improved over the semester as they became more aware of what I was looking for. I gave them the option on several assignments to revise their work before getting a final grade. The emphasis on writing perhaps also contributed to the designs suffering. There was room for improvement on all the designs submitted at the end of the semester. If I taught this course again, I would have more milestones for feedback on the designs themselves.

Spring 2019 - ITIS 4011 / 6011 - Instructor for Interaction Design Studio

Overview

I was the instructor for the Design Studio course under the supervision of Dr. Mary Lou Maher. I created the theme of the course, the assignments, and led the classes with her guidance. The Interaction Design Studio is an upper level capstone course that centers around a semester-long project with a different design challenge each time it is taught. Past iterations have focused on designing interactive systems to prompt elderly people to be more physically active or design something relating to 3D printing prosthetic devices for children who have limb differences. When I taught it, the theme was design an interactive wearable garment to make people think about something. Students also displayed their pieces in Statement Making, a digital fabrication fashion show hosted by several fab labs on campus.

In the course, I created the activities around the idea of playing with things and playing with ideas. To learn the digital fabrication tools, students had tinkering assignments, which were open-ended explorations. We also did some design fiction exercises, which was how we played with ideas. We reflected on some of these assignments to come up with a definition of play and understand how play could be a useful technique in design. This is very different from the structured user-centered design process they are used to and we discussed how there was a time and a place for each. As the course went on, at various points I realized that students were getting onto a different track in their thinking, so I added some in-class activities to focus or collect their thinking to ensure the scope of the course wasn't too broad.

As a studio course, the students were expected to complete significant work outside of class and come to class ready for reflection and discussion. Much of the work was open-ended since each group had a different focus and different challenges. In class, sometimes there were structured activities to prompt a certain type of thinking, sometimes there was semi-structured discussion, and sometimes it was dedicated to students getting and giving feedback on their semester design projects.

Reflections

All groups successfully made something that they displayed as part of the fashion show at the end of the semester. The finished products did not all live up to their initial visions, but the design process certainly sparked interesting conversations amongst the students in class, which was one of the goals. Some of the students were really engaged with the

project and were clearly very driven to create something great. Others were less engaged and let their group members drive the project. There were some group dynamics challenges, where group members weren't doing what they said they would or were being outright unagreeable. To mitigate these challenges, I tried to help groups structure their communication by helping them set up a document where they would keep track of who is doing what tasks by what time, but since I wasn't grading these documents, groups did not continue using them.

There were a lot of concepts packed into a semester long course, which may have been a lot. Students had to learn how to 3D print, laser cut, program electronics, think about computing and design in a new different way, and apply all of this to a functioning piece of clothing that would be seen by many people. In the future, I might do a series of mini rapid garment design / prototypes throughout the semester to build confidence and help them understand how to scope things in a reasonable way.

I spent a lot of time one-on-one with the groups. The class-wide discussions were not always the most fruitful, particularly because I couldn't get a sense for what percent of students were on board or if it was just the few vocal ones who understood. In the one-on-one time, I could ask more specific questions about what each student was thinking and where they thought they were headed. This is where I noticed some of the group dynamics and could sense that some students were more engaged than others. The type of design we were doing was certainly less directly "useful" more typical HCI design, so I wonder if some personalities were turned off by that, which contributed to the lower engagement. Only one student voiced that concern directly and we talked several times through how to relate the project to his prior values and conception of what computing is for. The class put him outside of his comfort zone, but I think he eventually understood why we were doing what we were doing. No other students raised concerns like this, though perhaps they had them but weren't vocal about it.

CTL workshops

Spring 2020 - End-of-Semester Alternate Assessments and Projects

This was an online workshop aimed at helping instructors think through how to assess their students given instruction suddenly shifted to online in the middle of the semester. Some of the recommendations included a reminder that since there is no difference in where homework and classwork take place, that means that all work is just work, which

can make it seem like there is more than usual. For final assessment, instructors should minimize additional sources of stress. For example, using a remote proctoring system could be difficult to set up and cause technological complications. While it does reduce the risk of cheating, it is probably not worth the stress it may cause students.

They suggested a few different types of assignments and a few different principles to apply. One example is to take a project and divide it into multiple smaller pieces that students can get feedback on progressively. Other suggestions were to involve novel aspects to make the assignments more connected to life. For example, the Getty museum has been asking people to recreate famous artworks using objects in their house. An art history assignment could ask students to do something similar.

Many of the suggestions seemed to be relevant not only in the current educational climate, but also in more typical semesters. For example, breaking assignments into pieces so that students can get guidance along the way seems like a good way to build learning and development into the assessment process.

Fall 2019 - Viewpoint Diversity Workshop

I attended the Viewpoint Diversity and Civil Discourse workshop by Kim Buch. I was drawn to this workshop in particular because of how polarized things are in the United States currently and our typical strategy is to avoid certain topics rather than learn how to have a healthy conversation.

The workshop introduced the idea of Viewpoint Diversity as a type of diversity to consider in the classroom in addition to racial, gender, and socioeconomic diversity which are discussed more frequently. We discussed what it is, what the challenges are including environmental and personal factors, some psychology that explains why it is so difficult to accept or even listen to viewpoints that differ from our own, and some strategies for how to deal with opposing viewpoints in the classroom. Discourse happens when both sides speak listen, and respond to what the other has said. An important part is to not shut down dissenting opinions, but rather to let both sides speak and manage escalation. I found the workshop insightful and it led me to a series of reflections on how it applies to discussions we have about technology in the classroom, in particular the way I led discussions about technology in the Interaction Design Studio course that I taught in Spring 2019.

In general, we too often present and discuss technology as neutral, but there are so many biases inherent in it, it reinforces so many things that we don't think about, and every

decision we make as we create new technology aligns with a value system that we never discuss. A number of people have called attention to the fact that tech ethics are not discussed enough; there is sometimes a tech ethics course tacked on or added as a module, but in reality, ethics should be part of every discussion in tech and an integral part of technology development. There are also still a lot of grey areas with tech ethics and many situations in which there is not one clear correct answer. If we consider viewpoint diversity relative to tech ethics, this means that tech ethics needs to not be communicated as a list of things to think about regarding each tech concept students are learning, but rather tech ethics needs to be integrated as a space for students to learn how to generate those lists on their own and figure out new questions to ask. The tech ethics of today likely won't be relevant or complete enough to deal with all the issues that we face tomorrow.

The Design Studio course was not dealing directly with tech ethics, though we were provoking some questions about ethical dilemmas of current and future technology. I'm thinking about how I could have fostered more civil discourse around the topics. Particularly relevant was the prompt I gave the students, which was to design technology to provoke thought or represent a critical perspective about our relationship with technology. Embedded in that prompt is the shadow of my own agenda for and my own viewpoint in regards to technology. I think I managed to give students with similar agendas to explore and express that through technology, but I'm not sure I provided room for students who didn't have that agenda to speak. In design studio courses, there usually tends to be a set of students who are engaged and lead their groups while the rest follow and do minimal work (which is a different problem in itself). I saw this happen in my class and perhaps that distinction was also due to the prior viewpoints of the students- those with a certain viewpoint related to the design prompt and readily took ownership of the project, while the others were less engaged. The prompt hinted that students needed to do something contrary to the status quo. Should we have had more of a discussion about the status quo before doing something contrary to it? I know something we did not do enough of was interpreting other designs, perhaps this would have been relevant for viewpoint diversity as well. I wonder how I could shape the design studio where I teach students how to think about and develop opinions about current and future technology for themselves.