
HCI Curriculum Across Disciplinary Borders: a Case Study of Teaching UX outside the Computing Sciences

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Abstract

Computer Science programs often take an engineering-centric approach to Human Computer Interaction (HCI) that tends to lack the comprehensive methodological approaches to social interaction found in the social science, or the reflective practices defined by critical social theory as found in the communication studies. At the same time, social science undergraduate programs tend to lack courses that train students how to develop interactive interfaces or analyze behavioural data collected in studies with human participants sets. In this position paper I argue that what is needed is a curriculum that transcends the confines of “traditional” disciplines and instead offers students opportunities to study the emerging challenges of our increasingly-interactive society and to learn how to address them through design that incorporate foundational concepts from a variety of other relevant disciplines (anthropology, psychology, sociology of technology, arts, humanities). For this I draw from a case study of three senior-level undergraduate HCI courses in a social science program that illustrate the challenges and benefits of adapting and extending “traditional” HCI curricula across disciplines.

Introduction and Motivation

Human-Computer Interaction (HCI) is one of the most dynamic fields of research, where scientific explorations

are strongly connected to real-world advances. In contrast to many other disciplines, HCI teaching and research is closely intertwined with industry advancements – this is very visible in the large number of graduates we observe from our own programs that are joining such industries. This appears to be often driven by an increase in interest in User Experience (UX) across many sectors (industry, government, healthcare, etc.) While on the surface this appears to be a highly beneficial inter-dependence, I argue that our HCI curricula needs to broaden its reach beyond the traditional confines of computing disciplines. This is increasingly important as the demands of societal progress create pressures on universities to prepare students in a comprehensive way: not only as highly versed in a particular set of technical skills, but be able to apply these in ways that fully engage the cultural and societal shifts we are currently witnessing.

In this presentation I draw from the curricula developed for three senior-level undergraduate HCI courses in a social science program. I will use these as a starting point for discussions on the challenges and benefits for a cross-disciplinary approach to HCI.

Background

The case study is based on HCI-related courses that are being taught at the Institute of Communication, Culture, Information and Technology (ICCIT), within the University of Toronto Mississauga. ICCIT is in fact a multi-disciplinary degree-granting institute, drawing from social sciences, critical theory, communication, humanities, design, and computing disciplines.

The HCI courses are introduced in the third year (two course), with an advanced course introduced in the fourth (terminal) year. These build on a disciplinary

variety of first and second year courses that include communication theory, digital media design, and writing. The three courses are CCT380: Human-Computer Interaction and Communication, CCT383 The Interactive Society, and CCT485 User Experience Design. (a fourth course, CCT488 Human Centred Design is currently not offered but in process of being re-developed as an advanced-level HCI course).

Curricula challenges and innovations

At the workshop I discuss extensively the curricula for these three courses, and the challenges in implementing and adapting these to disciplines that are not grounded in computing sciences. I summarize here these adaptations.

Developing a completely novel UX / HCI curriculum, particularly within a program that is itself relatively new and without an incremental history of offering such course, is an endeavour that requires innovative approaches. The first of such approaches that I have taken was grounding the curriculum development of the foundational HCI course (CCT380) into the existing body of pedagogical practice within HCI, yet adapt it to an audience who may not have the technical background that is more common in such courses. For this, I have leveraged our students' digital media design skills, and the opportunities they often take with respect to employment in creative industries. At the same time, I aimed to expand the "employability" reach to meet the demands of many other industries (e.g. banking, government) for UX practitioners. I have design the syllabus of CCT380 to replicate the steps an industry practitioner or a UX research must go through for researching, building, and evaluation an interactive interface. This was complemented by the delivery of an appropriate theoretical background (based on the most

recent standardized curricula for teaching a third year introductory HCI course), combined with a scaffold approach to assignments – each assignment being one step toward the completion of a real-life UX project. The syllabus emphasized the earlier stages of the design process such as understanding users and collecting design requirements – skills that match the overall competencies students gain at ICCIT (as opposed to similar courses in Computer Science, where the production and evaluations are more dominant).

The fourth year course (CCT485) has been designed as a continuation of the foundational third year course. It covers more advanced topics such as Contextual Inquiries, Ethnography of Technology, Participatory Design, and A/B testing. Similar to CCT380, the challenges related to lack of especially programming skills lead to several pedagogical innovations. Primarily, this course has been centred around student-lead client-focused projects, where there is always a client or audience. This required changing the role of the instructor from being a grader of work to being a “production” or “client engagement” manager, as well as changing the dynamics of course work from submitting assignments and being graded after submission to a collaborative model where the instructor and the students work together on solving a problem. This was complemented by the implementation of a studio-based approach to working on assignments in which students, TAs, and the instructor work together in class in “sprints”, in a manner comparable to agile development (with the instructor being the product owner, the TA the scrum master, and students the development team).

Fitting for a multi-disciplinary institute, a third HCI-related course was introduced specifically to bridge the

gap between the “production” courses and those teaching critical theory or communication theory. This course (CCT383: The Interactive Society) has been motivated by the observation that many other programs such as Computer Science offer courses titled “Computers and Society” which attempt to bring a more socially-minded perspective to computation methodologies, yet an equivalent course for programs which are already grounded in social and cultural contexts does not exist. As such, CCT383 focuses on how societal and cultural transformations can inform the development of computing technologies. This course is leveraging ICCIT students’ critical and social analysis skills as well as their writing and visual design competencies, and applies these to understanding how society is affected by technological advances and how these advances may be directed to address areas of concern or need. Students engage in critical activities based on peer-reviewed scientific paper (related to a topic that is considered “hot”, e.g. the ethics of AI), and propose solutions that are grounded in HCI design.

Encouraging hacking initiative

While several challenges will be discussed at the workshop, in this position paper I highlight what I consider to be one of the key barriers in expanding the reach of HCI into non-computing disciplines. Intuitively, this may appear to be the lack of advanced programming skills – yet, I have found that this can be addressed through proper design of project work. Additionally, students who graduated from our program and obtained employment as UX managers report that programming skills were not required for their jobs.

Instead, one of the most difficult challenges that I have encountered was of a cultural nature. Possibly due to lack of exposure to programming and over-exposure to

a rigorous and scripted delivery of materials, many students lacked initiative in creatively approaching problem-solving. Some may call this “hackers” culture, which is common in more engineering-oriented fields where students learn to put together solutions with limited resources. To address this, I have brought another innovation to the pedagogy of delivering HCI courses in this setting – the underspecification of assignments and removal of grading schemes. Instead, assignments were treated as a project that is defined in negotiation with a client. By removing grading schemes I have shifted students’ focus away from delivering an assignment that satisfy a pre-imposed scheme. This teaches students to work with stakeholders, to define the scope of a problem, and to propose solutions to that problem. I coach students in developing such skills during immersive class activities – for example, in mini-hackatons during which students need to design a physical interface with a set of very limited resources under significant time pressure that must be usable.

Towards a global community of practice

In this position paper I presented three courses that teach HCI to non-technical audience. I use these to support my argument that we need to dedicate more efforts to developing an HCI curriculum that transcends the confines of “traditional” disciplines and instead offers students opportunities to study the emerging challenges of our increasingly-interactive society and to learn how to address them through design that incorporate foundational concepts from a variety of other relevant disciplines (anthropology, psychology, sociology of technology, arts, humanities). For this, we need to reach to venues outside of CHI and build knowledge repositories that will provide the resources

to meet these goals. I thus advocate for an information platform that is open and globally-accessible, which could be used to support curriculum exchanges. Additionally, open exchanges between HCI instructors (as supported by such a platform) will ensure that a “global” curriculum is always updated and relevant, as well as capturing perspective from multiple disciplines. Finally, an open access to such a curriculum-development platform has the potential to lead to the creation of global-reaching, community-driven, certifications for UX- and HCI-related teaching. Such certifications may be of particular benefit to colleges or universities where such courses are being taught, yet where no UX or HCI academic degree is conferred.

Author’s Bio

Cosmin Munteanu is an Assistant Professor at the Institute for Communication, Culture, Information, and Technology (University of Toronto Mississauga), and Co-Director of the Technologies for Ageing Gracefully lab (TAglab). For the past two decades, Cosmin's multidisciplinary work includes mobile interaction through speech and language, mixed reality systems, digitally-inclusive learning support for marginalized users, assistive technologies for older adults, ethics in human-computer interaction, and usable privacy and cyber-safety. Cosmin completed a Teaching in Higher Education certification (University “Politehnica” Timisoara, Romania). Since joining the ICCIT in 2014, Cosmin has been actively involved in developing a curriculum that teaches a socially-minded HCI (and UX) to disciplines outside the Computer Sciences. Cosmin’s pedagogical work has been supported by two University of Toronto grants. He was a co-organizer for the HCI Curriculum Workshop held at the GI 2017 conference.