

Towards Understanding the HCI Education Landscape

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ABSTRACT

Recent efforts have been made to realize the concept of the “HCI living curriculum”. To better understand the current landscape of our pedagogies, we implemented an online tool to gather and analyze educational patterns in HCI courses. Our goal is to uncover the pedagogical choices made in our HCI courses by analyzing syllabi information. Specifically, we wish to gain a better understanding of topic coverage, theories taught, and techniques practiced in the classroom. Furthermore, our tool enables regional comparisons of the data in the system. As a first step, we sampled a collection of syllabi from North American universities and present analyses from them.

CCS CONCEPTS

• **Social and professional topics** → Professional topics; Computing education; Computing education programs; Computer science education; • **Human-centered computing** → Human computer interaction (HCI).

KEYWORDS

HCI education, HCI living curriculum, curriculum design, syllabus, topic coverage, regional comparison, learning outcomes

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1 INTRODUCTION

Many efforts over the last few decades in human-computer interaction (HCI) education highlighted challenges unique to teaching HCI in comparison to traditional areas in computer science. Due to the rapid changes in technology, and thus, changes in user populations and their needs, many scholars have identified the HCI curriculum as a moving target. Moreover, the idea of an “HCI living curriculum” was developed to capture precisely the fact that the curriculum needs to evolve alongside the changes observed in the field [3]. With this in mind, researchers around the world began making collaborative efforts to realizing this goal.

In order to collaborate on developing a living curriculum at a global scale, it is crucial to understand what different educators

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do currently and where the strengths lie. In particular, it would be helpful to know where HCI courses are being taught, what theories and methods are covered in those courses, what pedagogical techniques are applied in the classrooms, how they may differ across geographical regions, and what patterns exist over time. While the literature has been populated with various case studies that address specific aspects of these issues (e.g., [2, 5]), we would ideally like to have a single source of information that facilitates such patterns to be easily revealed to end-users.

As part of this initiative, our goal is to better understand the current landscape of HCI pedagogies. Specifically, we wish to gain a better understanding of topic coverage, theories taught, and techniques practiced in the classroom. Where data is available, we would also like to conduct geographic comparisons to identify regional strengths and changes in pedagogical choices over time.

As a first step, we manually curated HCI syllabi from North American universities and analyzed the syllabi content. Although our sample is small, we present preliminary insights on a suite of existing HCI courses. As a contribution to the community, we developed an online tool to facilitate pedagogical analyses by end-users. This tool can serve as a database of HCI course information. We encourage other HCI educators to contribute their syllabi and make suggestions for future enhancements to the tool.

2 RELATED WORK

Significant milestones in HCI curriculum design took place in the early 1990’s [6, 12]. Since then, many approaches have been proposed to tackle challenges unique to teaching HCI. Along with other efforts in understanding pedagogical trends in the field, Churchill et al. [4] reported on an extensive project that interviewed 52 SIGCHI members and surveyed 872 educators worldwide. The survey reports on a variety of pedagogical trends, including the perceived importance of HCI topics and techniques.

Syllabi analyses have been done in domains such as CS1 to compare course expectations and student learning outcomes [1], in HCI to analyze the variations of content taught across faculties and institutions [8, 10], and in higher education courses to explore automatic transfers of course credits [9]. Syllabus collection efforts have also been mentioned in the literature [7, 11] but we were unable to locate these sources.

3 METHODOLOGY

We focused our attention on collecting course syllabi as a means to assess HCI curriculum in a systematic manner. We started by retrieving a list of universities and colleges with high ranking computer science programs (www.macleans.ca for Canada and www.niche.com for the U.S. on 15/09/2019). We also had some HCI courses that came from personal contacts. For each school, we searched the institution website, navigated to the computer science department course listings, and looked for a detailed course syllabus and/or

a course website. If a syllabus was not found but the instructor contact information was listed, we reached out to the instructor personally in hopes of obtaining a syllabus.

Due to a lack of standardized structure, we manually extracted the content from each syllabus to populate our database. A detailed syllabus contains information stating the course instructor, website, along with various administrative details, a general calendar description of the course, a week-by-week breakdown of topics taught, evaluation criteria, as well as learning outcomes.

In total, we entered 33 syllabi into our database (24 from Canada; 9 from USA). We found 6 of them were dated 2000, some dated between 2007 and 2017, 6 dated 2018, and 14 dated 2019.

4 PRELIMINARY ANALYSIS

To facilitate our analysis process, we built an online tool called What We Teach (<http://whatweteach.herokuapp.com>). Given the small sample, we offer a preliminary analysis only. To analyze topic coverage, we mined the weekly topics from the syllabi to obtain a frequency of topic terms. Figure 1 shows the top 20 most frequently occurring topics in our database. The x-axis shows the number of times each term appeared across all syllabi. Themes such as design, group work, and evaluation were clearly highly valued. Figure 2 shows a comparison of the 10 most frequently occurring terms between two regions (Canada and USA). We see that both regions cover similar terms such as design, prototyping, interaction, and projects. Interestingly, there was more emphasis on design and evaluation in the Canadian syllabi, and more on presentation, modeling, and web technologies in the American syllabi.

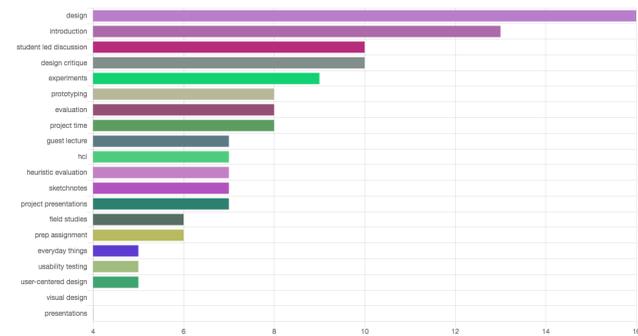


Figure 1: The top 20 most frequently occurring topics.

To assess pedagogical choices, we mined the evaluation criteria to identify whether a course has a project or a final exam. We found that most courses had either a project (20 out of 33) or final exam (18 out of 33), and only 5 courses had both. In the future, it would be interesting to obtain information on classroom techniques so that we can do more pedagogical searches and comparisons.

5 SUMMARY AND FUTURE WORK

This work presents our initial efforts in building an online pedagogical tool to help understand the types of HCI courses that are taught at the undergraduate level. We hope that our tool provides a starting point of reference for those wishing to develop their

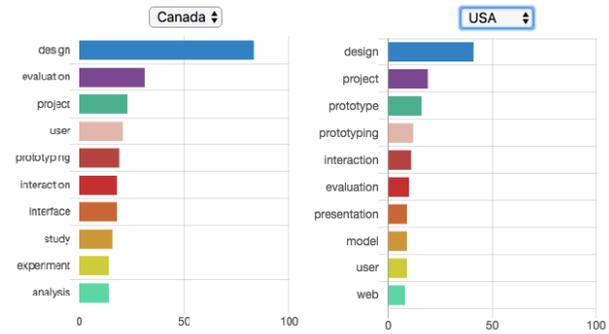


Figure 2: A comparison chart showing the top 10 most frequently occurring terms between two regions.

own HCI curriculum or those exploring collaboration opportunities among other HCI education researchers. In general, we encourage development feedback on this tool so that we can make it more useful for the community.

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