

Charting the Landscape of HCI Education in Brazil

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Abstract. One of the issues the Brazilian HCI community has paid great attention to is HCI education in the country. One of the efforts has been to understand, through the use of surveys, how HCI has been taught in Brazil. So far, two reports on HCI education profile in Brazil have been presented: one from 2009 that described HCI courses being taught, and another from 2012 that was in response to a SIGCHI demand and targeted a broader audience, not taking into account specificities of the Brazilian context. Therefore, the need for an updated analysis of HCI education in Brazil was identified and a new survey applied. In this paper we present the initial analysis of the results of this survey and delineate what HCI courses have been offered at undergraduate or graduate levels around the country and their topics they cover.

Keywords: HCI Education, Brazilian HCI community.

1 Introduction

Fifteen years have passed since the recommendation of HCI courses to the Brazilian Computing programs by the Brazilian Computer Society (SBC).¹ During this time, the HCI community in Brazil has deepened discussions about its education matters, reporting different approaches HCI courses or modules [3]. Such discussions took place in working groups and, in recent years (since 2010), mainly at a permanent workshop during the national HCI conference.

Besides the discussions, the community has been trying to collect data about the way these courses that have been taught in Brazil. Two surveys have already been applied in the community: the first one, in 2009, which collected data about HCI

¹ <http://www.sbc.org.br/en/>

courses being taught countrywide [37], and the second one, in 2012, in response to a SIGCHI demand, aimed at identifying the opportunities and challenges of HCI teaching [3]. The 2012 survey brought us interesting results, but since the survey initially targeted a broader audience – it did not take into account Brazilian specificities – some important points were left out. Then, in order to broaden our work, in 2013 a new survey – specific for the Brazilian HCI Community – was designed and applied.

In the next sections, we present the applied survey and its results, as well as a comparison between the new results and the older ones, in order to better chart the landscape of HCI Education in Brazil.

2 2013 Landscape of HCI Education in Brazil

The 2013 survey was open for the community to answer from April to July. It consisted of an online questionnaire, which was distributed to several HCI email lists in Brazil, in an attempt to reach not only Computer Science faculty, but also designers and related professionals who teach HCI in Brazil.

2.1 Respondents' Profile

Overall, 114 people answered the survey, but only 75 of them were considered valid (since filling out information on at least one taught class was required).

Respondents consisted of HCI-related professors, whose degrees and majors varied, though most of them (67%) are directly related to Computing. Nineteen percent (19%) claimed to have a Master's degree or Doctorate specifically in HCI, and 48% claimed to have other Computing-related degrees. The remaining respondents belong to such fields as Graphic Design, Business, Anthropology, Arts, Psychology, Education, Marketing and Electrical Engineering. Such variety thus points to a multidisciplinary feature observable in customary HCI teaching. Respondents' HCI teaching experience averaged 4.7 years, but 37% of respondents reported between 6-7 years of HCI teaching. This last piece of information strengthens the fact that HCI is a new field in Brazil, still inexistent in many universities' curricula.

The graphic displayed in Fig. 1 shows respondents' geographical distribution throughout Brazil. Teachers who responded to the survey are affiliated with both public and private universities, totaling 26 federal universities, 11 state universities, and 15 private universities.

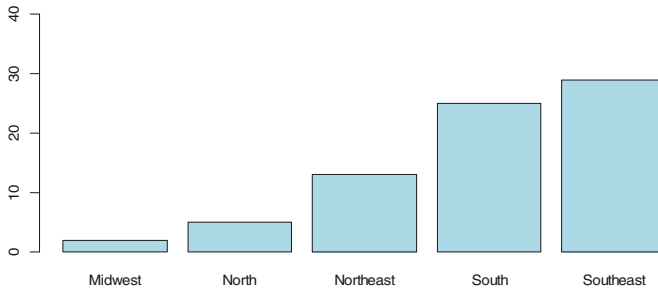


Fig. 1. Nationwide respondents' distribution

2.2 Undergraduate HCI-related Courses

We investigated undergraduate courses fully dedicated to HCI and only related to HCI. Among the dedicated ones, the fact that they were similarly named in different universities stood out. In addition, the emphasis each course gave to HCI did not differ greatly.

HCI-related contents showed up in such courses named as 'Software Engineering II', 'Graphic Design: Webdesign', 'Languages for Structuring and Presenting Content', 'Graphical and Multimedia Environments', 'Cooperative Systems' and 'Education and Novel Technologies'.

As for Bachelor's Degrees, the course load for specific HCI courses varies from 60 to 90 hours, and there was a single 40-hour course mentioned in reference to a vocational education training course. When it comes to HCI-related courses, informants reported that work hours allocated to teaching HCI varies from 4 to 40 hours. The number of students in these courses averages 31 – the smallest group consisted of 10 students and the largest one had 60 students.

The number of HCI courses reported by different programs can be seen in Fig. 2. There was a total amount of 70 courses; many of them are linked to more than one program at the same University and were taught by more than one professor.

None of the mentioned HCI courses requires prerequisites, and not all of them are mandatory. They are offered in different semesters, and most of them belong to Computing majors, which correlates to the degrees teachers who answered the survey. Among the mentioned major programs, Computer Science (CS), Computer Engineering (CE) and Information Systems (IS) are the ones that offer most HCI courses.²

² Systems analysis and development was not considered because it is a technical course and not a major program.

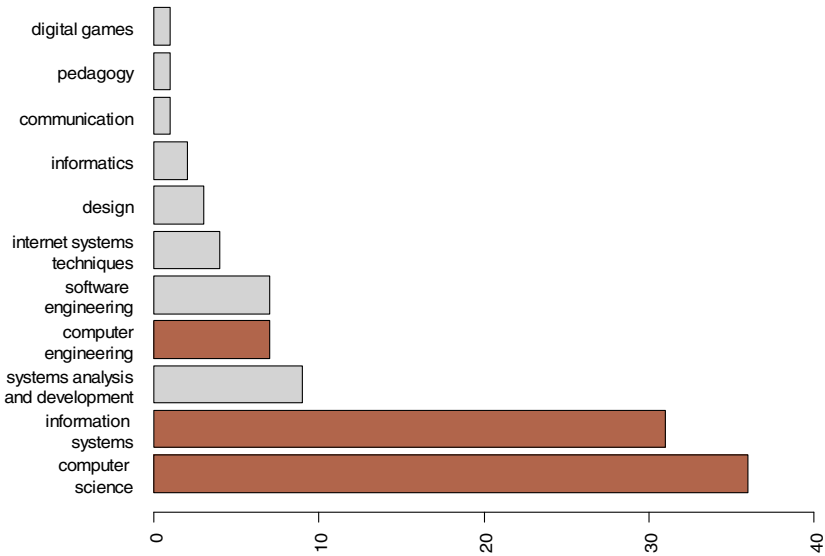


Fig. 2. Number of HCI courses per major

By focusing on the three high-frequency HCI course majors, we can further observe the number of HCI courses per major in Fig. 3 below, which also shows whether they are mandatory or not.

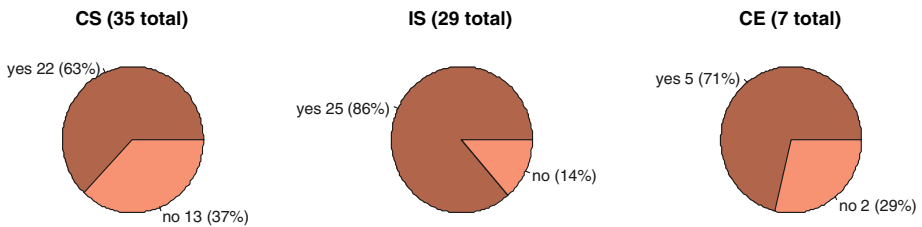


Fig. 3. HCI mandatory ratio on CS, IS and CE curricula, as reported in the survey

When analyzing all courses and their corresponding curriculum study load at the universities, we can classify the main topics in the following groups: (i) Basic Concepts; (ii) HCI Analysis; (iii) HCI Design; (iv) HCI Evaluation; (v) Other Topics, which chiefly include Assistive Technology and Accessibility, Information Visualization, Information Architecture, Websites and Multimedia Content and, lastly, Mobile Devices Interaction.

Fig. 4 shows the course load distribution in hours assigned to each topic mentioned in all curricula study loads for Computer Science, Information Systems and Computer Engineering. It enables us to picture the variations among the emphases each major gives to each topic, which define the commitment each of them hold in shaping future professionals.

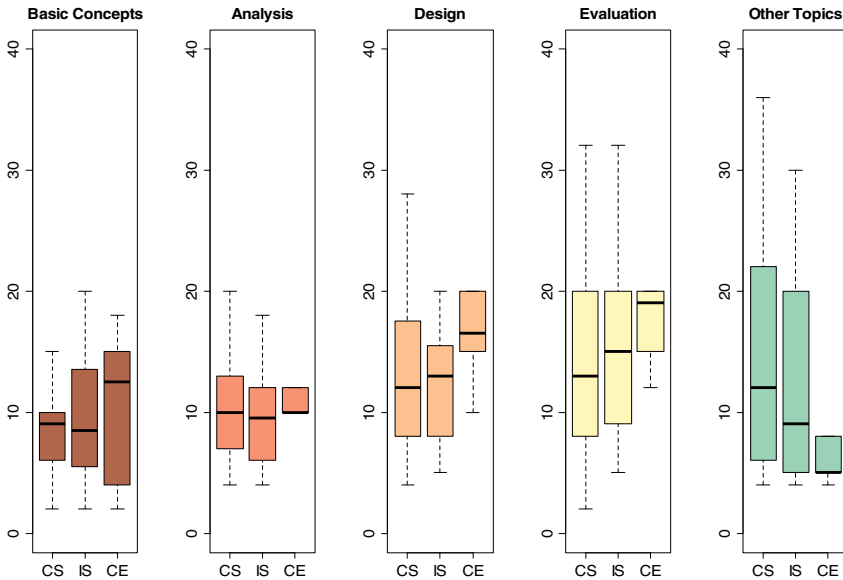


Fig. 4. Study load for each topic and course, in hours

The graphic in Fig. 5 demonstrates the bibliography mentioned in course descriptions. Notice that half of the entire textbook list corresponds to titles in Brazilian Portuguese (represented by an asterisk next to the authors' names). It is also interesting to notice that the top three most often used books are in Portuguese and that the top two textbooks are used twice as much as the ones following in the list. The top book on the list is a Portuguese version of the 1st edition of the book, which is already on its 3rd edition in English. The high preference for books in Portuguese indicates that it is much easier for students to use a book in their native language, and not all Brazilian students read English well.

2.3 HCI Courses in Graduate Programs

Sixteen HCI-specific and HCI-related courses were mentioned, all of which are offered in Masters' and doctorate programs in the computing field, except for one course, which is offered in a multidisciplinary program. The list below displays the course names.

- Alternative Techniques on Interaction and Virtual Reality
- Design and User interface evaluation
- Human Computer Interaction (2 instances)
- Information Architecture
- Intelligent Interfaces
- Interaction Design
- Interactive Systems Quality
- Interface Projects

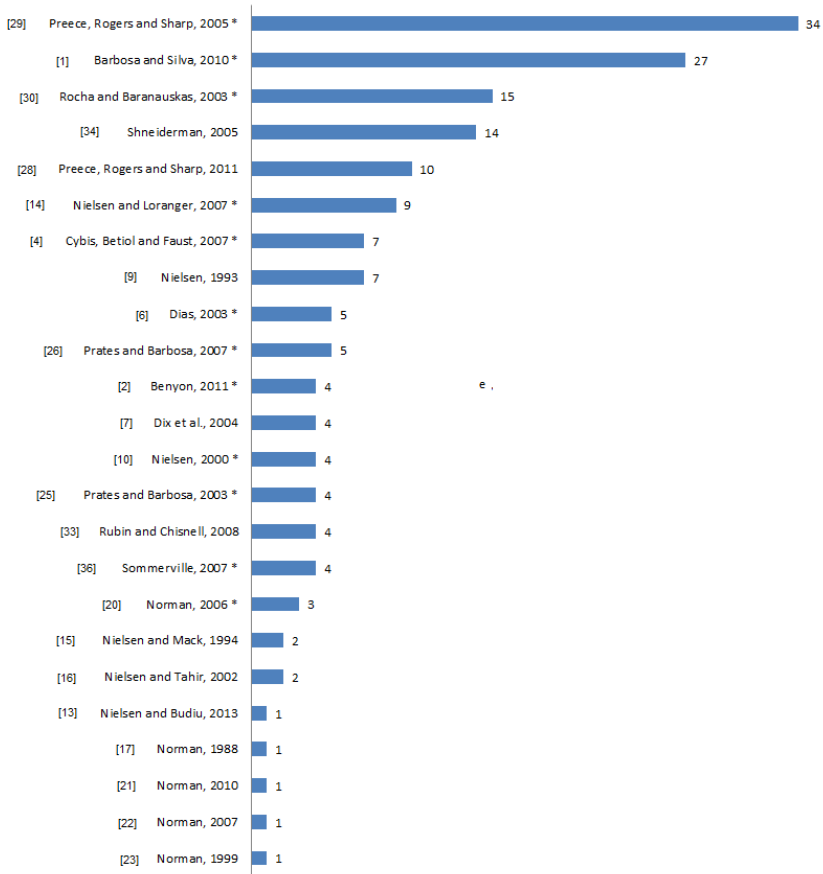


Fig. 5. Most often used textbooks in undergraduate HCI courses

- Introduction to Human Computer Interaction
- Research Design and Academic Writing
- Semiotic Engineering
- Special Topics on HCI and SE
- Topics on HCI
- User-centered Design
- Visualization of Information

Considering that many undergraduate programs lack either HCI courses or prerequisites to them, when we analyzed specific graduate HCI courses and their syllabi, we noticed that their topics end up being similar to the topics grouped in Section 2.2, though they may differ in emphasis and depth. However, at the graduate level, courses on more specific or advanced topics were listed: ‘Cooperative Interface’, ‘Ergonomics’, ‘Semiotic Engineering’, ‘Natural and Artificial Interface Languages’, ‘HCI interactions with Software Engineering and HCI Research Methods’.

When observing the course syllabi – corresponding to both undergraduate and graduate levels –, a variety of topics stand out in all Brazilian HCI courses, which further points to concerns with Information Visualization and Data Manipulation. Besides illustrating that, Fig. 6 also portrays a nationwide multidisciplinary approach to this field.



Fig. 6. Word frequency counter for HCI disciplines course topics in Brazil

At the graduate level, the list of adopted textbooks shows that not only is the number of books smaller, but many of them are Brazilian Portuguese versions of textbooks in English (Fig. 7). Most books deal with general topics such as HCI Concepts, Analysis, HCI Design and Evaluation.

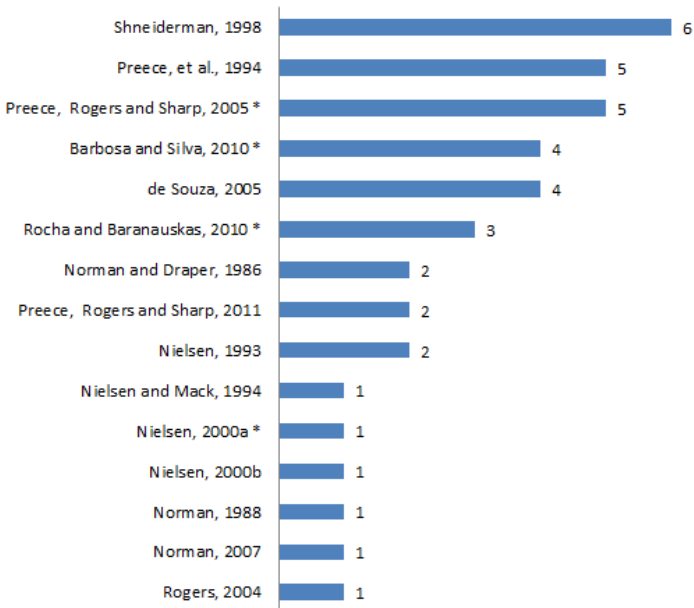


Fig. 7. Most often used textbooks in graduate HCI courses

The workload of such disciplines adds up to 42 hours, with an average of 10 enrolled students.

3 Exploring This Landscape

Although the majority of HCI courses are mandatory in CS (63%), IS (86%), and CE (71%) majors, their study load is still low, 75 hours on average, which means one course during the entire undergraduate program. The results show that the focus of the course for each program varies according to the course. CE courses, for example, emphasize basic concepts, design and evaluation. On the other hand, CS and IS courses, in general, make a more balanced distribution of the topics, dedicating more hours to other topics than CE does. Thus, although courses in different programs cover many of the same topics, they explore them differently. As a result, they form computer professionals with different HCI knowledge profiles, which could be interesting to fulfill industry needs.

Concerning the undergraduate HCI programs, we noticed that half the books adopted were in Portuguese, and that those included the three most often used books. This indicates that HCI education material in Portuguese is a better resource for our students. Looking closer at Portuguese titles, we notice that half of them are national productions and the other half translations to Portuguese. The advantage of also having books written by our HCI community members is that they could include in the text issues that are relevant to the Brazilian society and culture, as well as HCI perspectives and approaches broadly researched in Brazil.

The results regarding graduate courses indicate that their topics are similar to those of the undergraduate courses. As many departments do not have undergraduate courses, the opportunity to explore HCI concepts often occurs only at the graduate level. Besides, as HCI is a recent area of study in Brazil, many professionals and students who enroll in Master's and Doctorates programs do not have formal HCI knowledge in their background. Consequently, it is necessary to offer introductory HCI courses at the graduate level as well.

On the other hand, in departments with HCI courses at the graduate level, it is possible to explore special and advanced topics about novel concepts and theories of HCI, such as Semiotic Engineering, for example. It is also possible to relate HCI to other Computer Science disciplines in HCI graduate courses.

The short bibliography list of graduate courses suggests that, at this level, other resources complement the textbooks, such as journal and conference papers. This offers the opportunity to discuss the most recent topics discussed in different events worldwide and brings to the students a broader view of HCI.

4 Conclusions and Future Work

The 2013 survey aimed to explore the scenario of undergraduate, graduate (stricto and lato sensu) and independent HCI disciplines. In this paper, the focus is on

undergraduate and *stricto sensu* graduate programs. The data about *lato sensu* and independent HCI courses will be discussed in future works.

Although this survey was widely distributed, the response rate was low. We believe this may have occurred because the survey required participants to enter detailed information on the courses taught, which was quite time consuming. Thus, although the survey included participants from all Brazilian geographical regions and allowed for an interesting analysis of what is being taught, we cannot make any claims regarding its statistical validity. Furthermore, most of the respondents were from Computer-related fields. Thus, one of the challenges we face is to succeed in collecting more data about HCI courses in other areas, such as Design and Communications, for example. Most of the job offers for HCI position in Brazil require a Design background, but the knowledge requirements are the same that are taught in HCI courses within Computer Science departments.

This paper presents an initial analysis of the data collected. A more thorough analysis of the courses' programs and how they relate to diverse aspects such as geographic region and number of students will be further explored in the next steps of our research.

To complement this survey, we would also like to investigate the students' perspective on the courses they take and how they use the acquired knowledge professionally.

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