

Do Students Receive Adequate Training in HCI Field?

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Abstract

There are millions of web applications and systems developed and used today. However, the majority of them have significant usability flaws. Given the exponential growth of the web, there is a possibility of us facing a web usability crisis. In order to avoid it, significant improvements in usability of web sites are needed. Therefore, more skilled HCI (human-computer interaction) specialists are needed. In addition, educating developers, designers, and their supervisors in HCI will also improve the situation. However, do we adequately educate IT (information technology) professionals in HCI? A study was conducted to analyze curriculums of US graduate-level IT-related master programs and to determine whether students receive adequate training in HCI field. The results of this study are discussed in the article.

Keywords: HCI training, HCI courses, HCI programs, IT curriculum, Human-Computer Interaction

1. INTRODUCTION

There are millions of web applications and systems developed and used today. However, the majority of them have significant usability flaws, and, therefore, are either a burden to companies or not as effective as they have been intended to be. In fact, Nielsen and Norman (2000) claimed that designs of about 90% of all commercial web sites contain usability flaws. Furthermore, Opaluch (2003) stated that usability problems negatively affect revenues, cost savings, and web traffic. In addition, even in 2003, the number of web sites was 10,000 times greater than the number of user interface specialists (Nielsen 1999). As a result, the lack of user interface specialists may lead to a Web usability crisis. In other words, there will be an enormous amount of poorly designed and hard-to-use web sites.

In order to avoid the usability crisis, significant improvements in usability of web sites are needed. Therefore, more skilled HCI (human-computer interaction) specialists are needed. In addition, educating developers and designers in HCI will also improve the situation. Finally, very often, management and supervisory staff do not allow for sufficient usability testing or any usability testing at all due to the lack of

understanding of usability concepts and benefits. Therefore, they should be educated on HCI as well.

What is the primary source of application/interface designers' and developers' education? The answer definitely points to educational institutions offering IT-related programs of study. Therefore, this study was conducted to analyze curriculums of US graduate-level IT-related master programs and to determine whether students receive adequate training in HCI field. Master programs were analyzed to make sure that the results of the study cover developers, designers, and management and supervisory staff.

2. APPROACH

The approach taken in this study consists of five major phases: Identification of educational institutions, Identification of HCI courses, Analyses of identified HCI courses, Identification of HCI majors and concentrations, and Collection and reporting of data.

Identification of Educational Institutions

One hundred and ten U.S. educational institutions offering graduate-level master programs in IS were identified by the Association for Information Systems (www.isworld.org). Master-level programs included

Master of Science (M.S.), Master of Arts (M.A.), Master of Business Administration (MBA), etc.

Identification of HCI courses

Once educational institutions were identified, the scope of the study was expanded to include not only IS programs but also other IT-related programs, such as MIS, computer science, computer engineering, software engineering, information systems management, etc. offered at institutions identified in previous phase. We analyzed curriculums of these programs to identify HCI courses, if any.

Identification of HCI courses in curriculums was conducted in two ways:

- 1) Names of courses were analyzed to determine if they could be characterized as HCI courses. For, example, course names containing keywords such as human factors, human-computer interaction, computer-human interaction, etc. or any combinations of the above mentioned keywords, were categorized as HCI courses. Then, descriptions of these courses were examined to make sure that these courses cover HCI principles.
- 2) If names of courses did not contain the above mentioned keywords, course descriptions of all design and development courses were examined to determine if they contain HCI topics. In this case, descriptions of web design, web development, software design, software development, etc. courses were examined.

Analyses of Identified HCI Courses

For programs containing HCI courses, further analyses were performed to determine whether identified HCI courses are required or elective courses.

Identification of HCI Majors and Concentrations

Institutions identified in Phase I were examined to determine whether HCI majors or concentrations are offered.

Collection and Reporting of Data

The data was collected and reported on an institutional basis.

3. DISCUSSION OF THE RESULTS

The results of the study suggest that only thirty-seven out of one hundred and ten educational institutions reviewed in this study offer HCI courses as part of curriculums of their IT-related master programs. However, a much larger number of institutions, sixty-seven, are not offering any HCI courses in IT-related master programs at all. The information on programs at six educational institutions was not available. In terms of percentages, only 34% of education institutions offer HCI courses, whereas 61% of institutions do not. Information on 5% of institutions was not available (Figure 1).

A closer investigation of those institutions that offer HCI courses as part of curriculums of their IT-related

master programs revealed that only eight out of thirty-seven institutions require students to take HCI Courses. The vast majority of institutions, twenty-nine, list HCI courses as electives. Percentage wise, only 22% of educational institutions that offer HCI courses as part of curriculums of their IT-related master programs list these courses as required, whereas, 78% of institutions list them as electives (Figure 2). If we look at the entire sample, the result is even more terrifying: only 7% of all reviewed education institutions require students to take HCI courses.

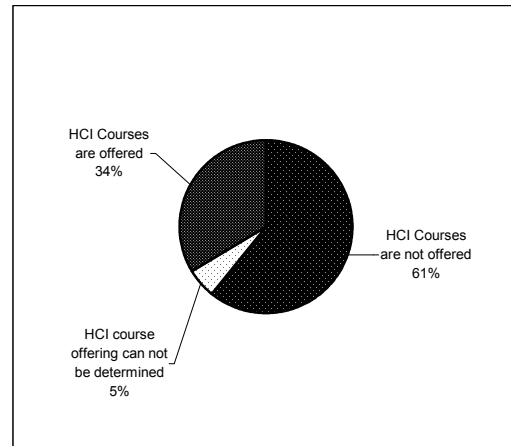


Figure 1. Percentage of Educational Institutions Offering HCI Courses in IT-related master programs.

Finally, only four educational institutions offer students an opportunity to major in HCI or to choose an HCI concentration in a master program. This corresponds to nearly 4% of the reviewed educational institutions (Figure 3).

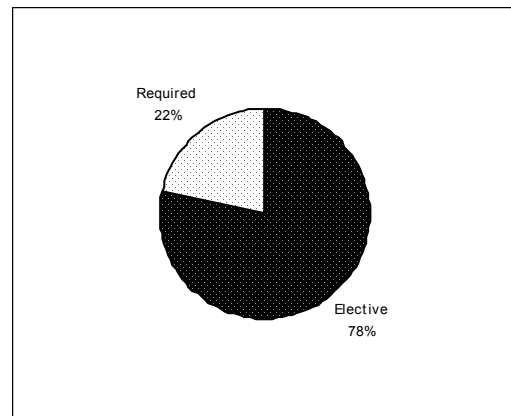


Figure 2. Percentage of Education Institutions Offering Required Versus Elective HCI Courses in IT-related Master Programs.

According to the Model Curriculum and Guidelines for Graduate Degree Programs in Information Systems

(MSIS 2000), HCI courses are not included in the group of core courses. Instead, HCI courses are listed as electives and are incorporated into the “Human Factors” career track (Gorgone and Gray 2000). As a result, only students who choose to major in HCI or select an HCI concentration will be taking HCI courses. Since only 4% of educational institutions offer HCI major or concentration (as revealed in this study), a vast majority of students will not be educated in HCI at all.

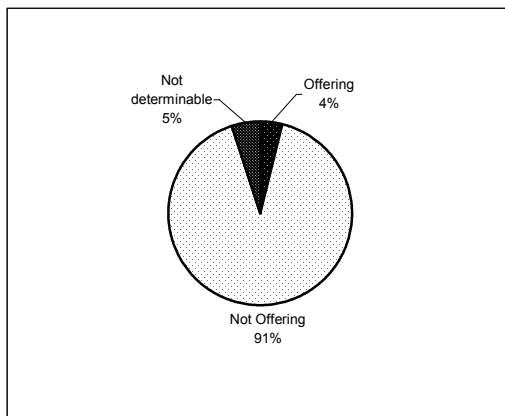


Figure 3. Percentage of Educational Institutions Offering HCI Majors or Concentrations in IT-related master programs.

4. CONCLUSION AND FUTURE RESEARCH

The results of this study confirm the deficiency of HCI courses in curriculums of master-level IT programs. Therefore, our developers, designers, and their supervisors are not properly educated on usability. As a result, we may encounter a vast amount of systems containing usability flaws. In order to eliminate the lack of HCI-related education and prevent development of systems with usability flaws in the future, we propose to revise curriculums of IT programs as follows:

- 1) Include one HCI course in a group of core courses for IT-related master programs. If this is not possible, then, at least, incorporate HCI principles into existing core courses.
- 2) Encourage educational institutions to offer HCI majors or concentrations.

To confirm the generalization of the results of this study, future research studies should be conducted using larger, more representative sample sizes. In addition, future research efforts are needed to further analyze programs that offer HCI classes as electives and to determine the availability of HCI courses to students. These programs may list HCI course as electives but offer them very occasionally or not offer them at all. Yet another expansion of this study is to look at the actual enrollment figures of HCI classes to determine the percentage of students taking these classes. Finally,

these studies could be conducted by analyzing undergraduate and even doctoral programs as well.

5. ACKNOWLEDGEMENTS

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