

Teaching Accessibility, Learning Empathy

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ABSTRACT

As information and communication technologies (ICTs) become more diffuse, the diversity of users that designers need to consider is growing; this includes people with disabilities and aging populations. As a result, computing education must provide students the means and inspiration to learn about inclusive design. This poster presents top-level findings from 18 interviews with professors from some of the top universities in the US. Our analysis yielded four categories of findings: (1) important student learning outcomes (the most common was for students to embrace diversity); (2) exercises and teaching materials (almost all focused on inclusion of people with disabilities in discovery and evaluation of ICTs); (3) frustrations and challenges (largely focused on how to engage students in accessibility topics); and (4) the importance of instructor initiative to include the topic of accessibility in their teaching. The unifying theme was the high importance of cultivating empathy with end users.

Categories and Subject Descriptors

K.3.2 [Computers and Education]: Computer and Information Science Education—*computer science education*.

General Terms

Human Factors.

Keywords

Accessibility, pedagogy

1. INTRODUCTION

As information and communication technologies (ICTs) become more diffuse, the diversity of users that developers and designers need to consider has expanded to include more people with disabilities. As a result, computing education needs to respond by providing students opportunities to learn about accessibility and designing for inclusion. This extended abstract summarizes results of a qualitative research study of practices in teaching accessibility in university-level programs in the US; specifically, we summarize findings from 18 interviews with professors from some of the top universities in the US who discussed their

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experiences teaching courses related to accessible computing.

While there is a clear need to include principles of accessibility and convey the importance of designing for people with disability in computing education, there is a lack of resources for instructors with little or no background in the area to know how to incorporate these topics into their curricula. While other articles have provided small-scale surveys or first person reflections about teaching accessibility [e.g, 1-3], this project fills a gap in the literature by providing results of a study across a larger number of instructors, courses, practices, materials and programs. We present a set of themes detailing best practices and challenges in teaching accessibility.

2. Methods

To identify instructors who teach accessibility, we started with the top 160 US universities listed in the US News and World Report. We then identified courses related to ICT accessibility and, when possible, contacted the last or current instructor. In addition to searching the top 160 US universities, we also identified other leads through the literature review and during interviews we asked our participants to refer us to other instructors who taught accessibility. In total, we contacted 236 people, which resulted in 18 completed interviews. All interviews were conducted in April-May 2014. See Table 1 for the list of participants.

Table 1: Interview Participants

Participant (A-Z)	Title (5/2014)	Institution (5/2014)
Dan Cosley	Assoc. Professor	Cornell Univ
Katherine Diebel	Instructor	Univ of Washington
Jinjuan Heidi Feng	Assoc. Professor	Towson Univ
Krzysztof Gajos	Assoc. Professor	Harvard Univ
Juan Gilbert	Professor	Clemson Univ.
Derek Hansen	Assoc. Professor	Brigham Young Univ.
Amy Hurst	Assist. Professor	Univ. of Maryland, BC
Julie Kientz	Assist. Professor	Univ. of Washington
Sri Kurmiawan	Assoc. Professor	Univ of California, SC
Richard Ladner	Professor	Univ. of Washington
Clayton Lewis	Professor	Univ. of Colorado
Benjamin Lok	Professor	Northeastern Univ.
Bilge Mutlu	Assist. Professor	Univ. of Wisconsin
Steven Reiss	Professor	Brown Univ.
Seth Teller	Professor (Deceased)	MIT
Gregg Vanderheiden	Professor	Univ. of Wisconsin
Confidential	Confidential	Carnegie Mellon Univ.
Confidential	Confidential	Fordham University

In the interviews, we asked about (a) details about the course(s) they have taught that included accessibility, e.g., number of students; (b) activities and/or assignments that had been particularly successful, and to explain why; (c) a memorable experience; and (d) if they were to run into a former student what would they like to have had the student recall about the course.

3. Top Level Findings

We grouped our findings into four categories: (1) important student learning outcomes; (2) exercises and teaching materials; (3) frustrations and challenges; and (4) the importance of instructor initiative. In all four categories, the unifying theme was to teach with the goal of cultivating empathy with end users.

(1) The most common desired **student learning outcome** (expressed by 12 interviewees) was the importance of students embracing diversity in order to keep accessibility in mind as they design technologies. For example, Sri Kurniawan told us:

“The one thing that I wanted [students] to take away is to really understand that number one, they are not designing for themselves, they are designing for people with a wide range of abilities and needs and preferences.”

(2) Examples of **exercises and teaching materials** fell into two subcategories: (a) approaches and (b) assignments. By far, the most common approach, mentioned by 7 of 18 instructors, was to facilitate direct interaction with people with disabilities. Clayton Lewis summarized the impetus for this activity well:

“I believe it’s really critical for people to get some first hand exposure, [some] interaction with people with disabilities. I think it is a subject that is difficult to appreciate from a sort of a book-learning point of view. And not just it can be hard to understand, it’s easy to misunderstand.”

Derek Hansen discussed direct interaction in the context of the challenge of helping students building ‘true empathy’:

“I think if it’s just a lecture alone on the topic I think sometimes it’s hard to really help them gain empathy and understanding.”

Another common approach was to simulate disabilities (mentioned by five interviewees) to help students build empathy. The most extensive model of simulating disabilities came from Gregg Vanderheiden in his description of the experience lab that he has built at the University of Wisconsin:

“...we have a series of approximately 30 experience stations (15 pairs of stations) that everybody in the class has to complete. At each of the station-pairs we give the student a different limitation (they wear a blindfold, or must use only a headstick, or use special limiting gloves to simulate arthritis, or vision limiting goggles) and two different products. One product is designed poorly (and it is very hard or impossible to use) and one that has been designed well (and it is no problem to use).”

The most commonly discussed assignments also emphasized involvement with people who have disabilities and focused on group projects to either build something using a user-centered approach or evaluate an existing application. At the University of Washington, Richard Ladner focused some computer science capstone courses on designing for diverse users and emphasized including people with disabilities not only in the discovery phases, but also in the evaluation. That way, projects “...get critiqued, and not just by me, or by the teacher but by people with disabilities to give them feedback.”

(3) There were several common **frustrations and related challenges** that interviewees discussed. Three of our interviewees discussed frustrations surrounding the lack of awareness about the importance of accessibility-related topics and how few students are exposed to accessibility in their programs. For example, Seth Teller explained that at MIT accessibility was covered in-depth in one elective course, but commented that the course did not reach very many students:

“...the class only reaches twenty to thirty students a term, and our department has more than a thousand students, so I’d say the exposure by our department to students broadly is pretty limited. I’d say most of the thousand students at any given year in the program will go through the year without hearing or thinking about accessibility.”

When we asked interviewees about activities they had tried that had been unsuccessful, they commonly mentioned how difficult it was to engage students when discussing legal and technical topics related to accessibility. For example, Krzysztof Gajos said:

“I’ve found that if I teach students the rules and the laws for accessibility that they fall asleep and still do a terrible job on their project, so I have shifted towards trying to build empathy.”

(4) A recurring theme in the interviews is the **importance of an instructor initiative**. Because the topic of accessibility is rarely embedded in programs and courses, individual instructors often have to take the initiative to include them in their teaching. Among out 18 interviewees, 13 had a research project or agenda related to accessibility. For example, Katherine Diebel told us:

“When I was teaching, I was generally introducing accessibility topics because I’m interested in them and I view them as important rather than they were already mentioned in the existing course.”

To conclude, the unifying theme throughout our top-level findings was the high importance of cultivating empathy with end users. Strategies for building empathy included (a) simulating disabilities so students get an embodied experience of using inaccessible technologies, and (b) including perspectives of people with disabilities in the classroom through testimonials, direct interaction, or other materials (e.g. movies) that attempt to present the world with an accessibility perspective.

4. ACKNOWLEDGMENTS

We would like to dedicate this project (and poster) to the memory of Seth Teller. We would also like to thank all of the interviewees for their time and thoughtful responses.

5. REFERENCES

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