

Engaging Student Programmers as Inclusive Designers

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ABSTRACT

While awareness of accessibility standards and guidelines can help students learn to produce accessible web pages, overcoming real-world accessibility issues often requires creativity and flexibility. One way to develop these skills is to engage student programmers in design practice. This poster describes an undergraduate web programming course that used pedagogical techniques drawn from architecture and industrial design education to enable students to empathize with users with disabilities and to creatively address accessibility issues. Evaluative feedback from students indicates that this approach is effective in encouraging accessible design practices.

Categories and Subject Descriptors

K.3.2 [Computers and Education]: Computer and Information Science Education—*computer science education, curriculum*;
K.4.2 [Computers and Society]: Social Issues—*assistive technologies for persons with disabilities*

General Terms

Design, Human Factors

Keywords

Accessibility, Education, Inclusive Design, Web Programming

1. INTRODUCTION

While many web programming courses include some coverage of web accessibility, this coverage is often limited to technical standards and guidelines. Students may follow these guidelines to address common accessibility issues and to create web sites that are largely accessible. However, knowledge of guidelines alone may not be sufficient to address all possible accessibility issues. Furthermore, students who have not been exposed to real users with disabilities and the challenges that they encounter may not be motivated to practice accessible design outside of the classroom.

Practitioners of design disciplines such as architecture and industrial design have addressed accessibility issues by adopting the perspective of *inclusive design*. This perspective considers accessible design as a creative process and emphasizes the importance of understanding and empathizing with users with disabilities. Inclusive design educators promote student awareness and empathy through activities such as role-playing, iterative prototyping, interaction with representative users, and reflecting on personal experiences related to disability and accessibility [1].

This poster describes an undergraduate web programming course that adopted an inclusive design perspective in order to promote accessible design practices in student projects.

2. INTEGRATING INCLUSIVE DESIGN

An inclusive design perspective was incorporated into the course in four ways. First, accessible design practices were discussed throughout the course. The topic of accessibility was introduced on the first day of class, and accessibility issues were discussed in relation to major course topics such as JavaScript and CSS.

Second, students were encouraged to take a designer's perspective in their work. Students sketched out potential designs, created prototypes, and critiqued each other's work. When possible, class assignments used design representations that were familiar to programmers, such as personas and design patterns.

Third, students participated in several in-class activities intended to raise awareness of excluded populations. The class discussed exclusion in design and created scenarios in which different groups of users were excluded by technology. Students watched a video that demonstrated assistive technology use at their own university, and simulated the experience of visually impaired users by using screen reader software.

Finally, students completed a group project in which they analyzed and addressed accessibility issues in their prior work. Projects addressed the needs of a wide range of users, including non-native English speakers, low-income users, and users with disabilities such as color blindness and Asperger's Syndrome.

3. CONCLUSION

Students completed a course evaluation survey at the end of the course. Eight students completed a follow-up survey during the subsequent semester. Findings from the surveys include:

1. Fifteen out of seventeen students rated the overall course experience as Very Good or Excellent;
2. Five students in the follow-up survey used inclusive design or accessibility techniques in subsequent work;
3. Six students in the follow-up survey said that they were "very likely" to practice inclusive design in the future.

An inclusive design framework is effective for introducing accessibility into a technical course. By integrating an inclusive design perspective with web accessibility techniques, students may develop the technical skills, design sensibilities, and awareness required to produce accessible web applications.

4. REFERENCES

- [1] Welch, P. 1995. *Strategies for Teaching Universal Design*. Adaptive Environments, Boston, MA.