WHO TEACHES ACCESSIBILITY? A SURVEY OF U.S. COMPUTING FACULTY

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Introduction





Introduction



Motivation



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Related Work

How to Teach Accessibility

Bigelow, 2012; Putnam et al., 2015 & 2016; Shinohara et al., 2016; Palan et al., 2017

- Empathy and diverse perspectives
- Engaging people with disabilities
- Project learning
- Guest speakers and video testimonials
- Curricular interventions Waller et al., 2009; Ludi, 2002
- Curricular change

Barnett et al, 2001; Kirk and MacDonald, 2001; Kezar and Eckel, 2002





What are faculty doing at a large scale to adopt and implement methods to incorporate accessibility in computing and information science curriculum?





352 institutions across the United States

14,176 computing and information science faculty

Responses from 1,857 instructors from 318 institutions

Research Questions

RQ1: <u>Who</u> is teaching accessibility?

RQ2: What <u>barriers</u> do faculty see to teaching accessibility?

RQ3: What factors <u>predict</u> who is teaching accessibility?

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Survey Sample

- Faculty at 4-year universities and colleges
- •Computer Science
- Information Science
- •Other interdisciplinary computing departments Major accredited programs as identified in:

Wikipedia

- Computing Research Association
- •iSchool Caucus charter list for Information Schools

Survey Sample: Crowdsourcing Contact Information

Mechanical Turk: Department and college site URL

- •Two different workers collect faculty names and contact information
- •Sites with 30+ faculty names split into 2 or 3 tasks
- •Flagged mismatches to check manually

Website data collection - Instructions (Click to collapse)

Click the link below to review the website. Collect the following information if it's available:

- · Names of all the faculty, lecturers, emeritus faculty and adjunct faculty
- Their contact email addresses

Collect all the names from A to Z and copy them below **WITHOUT Suffixes** (Ph.D, M.S. , M.B.A., M.Sc., M.Eng etc.) Or **Prefixes** (Dr. , Miss, Ms, Mr, Mrs, etc.)

Make sure you click on ALL tab on the side menu for complete faculty, lecturers, emeritus faculty and adjunct faculty list from all departments:

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Survey Instrument

RQ1: Who is teaching accessibility?

- Demographic information: gender, years teaching, area of expertise, personal connection to disability
- Do you teach courses that include accessibility?
- What pedagogies do you use to teach about accessibility?

RQ2: What barriers do faculty see to teaching accessibility?

- Should accessibility be taught as part of computer science?
- What resources would be helpful?

Survey Launch and Response Rate

SurveyGizmo, 3 Launches

Emails with link to survey sentTo 14,176 facultyFrom 352 institutions

Received full responsesFrom 1,867 facultyFrom 318 institutions

Response rate of 13%

Teaching Accessibility

Welcome

A Research Survey

Data from this survey will help tech-industry and higher-education institutions to create resources to lower barriers to teaching accessibility in computing and information sciences.

Thank you for participating in this 3-minute survey!

This survey is sponsored by the National Science Foundation (CNS-1042260 and CNS-1539179), the University of Washington's AccessComputing, and industry partners: Facebook, Google, Adobe and Microsoft.





RQ1: How many are teaching accessibility?

20% respondents DO teach courses that incorporate accessibility

Representing 175 unique institutions

•At least 2 faculty at 75 institutions

Estimate at least

•375 out of 14,176 or 2.6%

•175 institutions out of 352 or 50%

RQ1: What institutions teach accessibility?

Top college and universities



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RQ1: What institutions teach accessibility?

Top college and universities



RQ1: Who is teaching accessibility?

- Identified as female
- More likely to know someone with a disability
- Most common area of expertise: Human-Computer Interaction
- 17% identified as having a disability

100% 90% 19.6 80% 37.6 70% 60% 50% 40% 75.9 59.5 30% 20% 10% 0% Who Teaches Who Doesn't ■ Non-Binary / Prefer not to say Female W Male UNIVERSITY of WASHINGTON

Gender Identity and Who Teaches Accessibility

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RQ1: Areas of Expertise

Teaches Accessibility

HCI Software Engineering Information Assurance Cybersecurity Library and Information Science Computer Science Education Other Applied Areas **Does Not Teach Accessibility**

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Algorithms Theory Artificial Intelligence Machine Learning Programming Languages

Of All Respondents: 424 of 1857 indicated areas of expertise

<u>Top overall</u>: algorithms and theory, machine learning and robotics, HCI, software engineering, and networking and communication.

RQ1: Learning Objectives

- Understand technology barriers
- Understand design concepts
- Engage diverse populations
- Evaluate web accessibility standards and heuristics
- Develop accessible web technologies
- Employ design techniques
- •Understand Legal regulations (Section 508, ADA)
- Understand Models of disability
- Employ accessibility-focused technical languages and tools

RQ2: Challenges to incorporating accessibility

- •Not core part of curriculum
- •Don't know enough to teach it
- •No appropriate textbook
- Lack of students and administrator awareness
- Lack of support for topics addressing real challenges for disabled
- Difficulty engaging students
- Lack of demand in industry
- Difficult to recruit people with disabilities

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RQ2: What are barriers to teaching accessibility?

- Faculty who do not teach twice as likely to view as barriers:
- Don't know enough about accessibility
- No textbook
- Challenges engaging students



RQ2: What do faculty need?

"If you wanted to incorporate accessibility into your curriculum, what resources would be helpful?"

- Connecting or bringing people with disabilities into classroom
- Resources like tools, technologies, guidelines, problem examples
- Access to curriculum building and curricular samples in specific courses
- Training and opportunities to gain expertise





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RQ2: What do faculty need?

"Appropriate lesson plans for different classes (algorithms, theory, intro programming). This should be taught across the CS curriculum, not just in a specialty topics course. But, I feel that students and faculty feel that "it is not directly related to the curriculum" and so they don't incorporate it."

-Survey comment

RQ3: What predicts teaching accessibility?

What factors could be addressed to overcome barriers to teaching accessibility?

Binomial Logistic Regression to predict who reported teaching accessibility

- Identified as female
- Knowing someone with a disability
- Knowledgeable about accessibility
- Believe accessibility should be taught

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RQ3: What predicts teaching accessibility?



1.5 times as likely to know someone with a disability



2 times as likely to identify as female



2.1 times as likely to agree that accessibility is part of computing



3.5 times as likely to report having knowledge of accessibility



Recommendations to the CS Education Community

Local change agents can foster curricular change through social and instructional discourse, contributing to institutional culture Barnett et al, 2001; Kirk and MacDonald, 2001; Kezar and Eckel, 2002

•Hire HCI faculty

• Develop discipline-specific course and class level materials that incorporate accessibility

•Teach and train faculty accessibility concepts



Accessibility as a Grand Challenge

"Materials to motivate why a culture of change in computing is needed to both broaden participation and address sources of implicit bias. The largest hurdle is the mindsets that currently pervades computing that is oriented towards financial bottom-lines and achievable but incremental pursuits.

Accessibility must be seen as a grand challenge for computing."

-Survey comment



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Access Computing

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| | Come see other Accessibility focused events at SIGCSE |
|----------|--|
| Thursday | 4:10 pm, 320 Enhanced Robotics! Improving Building and Programming Learning Experiences for Students with Visual Impairments (Paper) 4:30 pm, 314 Teach Access: Teaching the Design and Development of Inclusive Technologies for All (Paper) * 5:30 pm, 314 Access to Computing Education for Students with Disabilities (BoF) 6:30 pm, 310 Designing CS Courses using Universal Design Concepts (BoF) 6:30 pm, 314 Teach Access: Teaching the Design and Development of Inclusive Technologies for All (BoF) 6:30 pm, 317 We're All in This Together: CS students, the tech industry, and mental health (BoF) |
| Friday | * 10:45 am, 308 2018 Panel of Computing Students with Disabilities (Panel) 3:00 pm, Exhibit Hall Bridging the Research to Practice Gap with Project TACTICal Briefs (Poster) 4:35 pm, 316 Teaching Inclusive Thinking to Undergraduate Students in Computing Programs (Paper) |
| Saturday | * 8:45, 323 Inclusive Teaching (Inclusion Track) 9:10 am, 320 A Cross-Case Analysis of Instructional Strategies to Support Participation of K-8 Students with Disabilities in CS for All |

Thank you!







