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Selah Bellscheidt

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# Exploring Methods of Collecting Accessibility Feedback

## **Selah Bellscheidt**

Department of Computer Science  
Western Washington University  
Bellingham, WA, United States  
bells@wwu.edu

## **Yasmine Elglaly**

Department of Computer Science  
Western Washington University  
Bellingham, WA, United States  
elglaly@wwu.edu

## **Abstract**

Accessibility, the practice of making a website or application easily usable and understandable by people with disabilities, is essential to ensuring that all users are able to participate equally in using the Web. However, currently many websites have accessibility issues. This study interviews 11 software developers and designers to learn about the methods that they use to collect accessibility feedback during the development and maintenance of websites and mobile applications. The research revealed a lack of standardized accessibility education at the post-secondary level, as well as a myriad of methods used to obtain accessibility feedback from automatic accessibility checkers to user testing. This work attempts to bring awareness of different current methods used, as well as current gaps in accessibility feedback methods where new methods and tools could be introduced.

## **Introduction**

In March 2022, WebAIM, a nonprofit centered around accessibility<sup>1</sup> research and education, released their annual WebAIM Million Survey where they ran the top million web pages through their automated testing tool WAVE. The survey found that 96.8% of the top million websites had WCAG 2.0<sup>2</sup> errors on their homepage, indicating widespread online accessibility issues [8]. Companies are working to combat online accessibility issues. Studies have found that technology professionals have a lack of accessibility knowledge. However, while large companies are able to hire accessibility specialists and train champions to support company-wide education on accessibility and create resources to help colleagues with less accessibility knowledge, significant barriers such as lack of time, money, management support, and company-wide accessibility knowledge prevent smaller companies from taking similar strides [1,2]. Although research exists on the methods that accessibility advocates and specialists use to increase accessible product development within companies, as well as on accessibility requirements and testing, there has not been research on current methods of getting accessibility feedback from people with disabilities to improve websites and applications after the software is published.

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<sup>1</sup> Accessibility is the practice of making a website or application easily usable and understandable by people with disabilities.

<sup>2</sup> WCAG 2.0 is a widely-used set of web content accessibility guidelines created by an international standards organization called the World Wide Web Consortium.

Accessibility feedback is defined as changes that can be made to remove barriers that prevent people with disabilities from successfully and easily using a website or application after the software is published. For example, one piece of feedback is to add alternative text to an image, a short description of the image that screen readers will read in place of the image, so that users with visual disabilities will understand the content of the image. In this study, we asked: (1) How do software developers and designers collect accessibility feedback from people with disabilities? (2) What are the types of accessibility feedback that would be useful to collect that aren't being collected currently? We found that there's a lack of formal accessibility teaching in post-secondary education, leading participants to be forced to largely self-educate or get help from peers when learning about accessibility. We also found that there is currently no standardized method for getting accessibility feedback during the development or maintenance phases, with different companies employing different methods from automated testing to A/B testing. Finally, we offer recommendations for steps that can be taken to increase accessibility awareness and methods of receiving feedback from people with disabilities that can be implemented in companies.

## **Related Work**

Previous studies have focused on ways that companies promote accessibility and barriers to creation of accessible websites and applications, as well as the creation of tools which could help to reduce these barriers and receive more accessibility feedback; however, less is known about current methods of obtaining accessibility feedback.

Prior research has shown that one of the major barriers to accessibility implementation is lack of awareness about accessibility, along with poor management support, existing misconceptions about accessibility, and inaccessible design requirements imposed by companies [5]. One way of increasing accessibility awareness that's been suggested is to include accessibility education in other classes besides computing classes, because accessibility should be the responsibility of the entire company, not just a select few [1,6]. Large companies often have accessibility champions or people working on accessibility teams to help educate their teammates regarding accessibility, as well as to create new tools to help fellow designers and developers make their work more accessible [2]. Unlike larger companies, smaller companies will often not prioritize accessibility due to a lack of time and resources, unless the company's leadership prioritizes accessibility [1,2].

Tools have been proposed to improve accessibility feedback collection on websites and mobile applications. The Public Barrier Tracker (PBT), is a mechanism proposed to standardize accessibility feedback gathered across public sector websites in the European Union, which is a requirement because of the Web Accessibility Directive. This method uses a database so that people can track and file their complaints, creating more transparency and accountability concerning feedback [3]. In an effort to improve accessibility of mobile applications, a research

team has trained a binary classifier to identify whether a review is accessibility-related or not. This model can be used on a company's reviews on app stores, in order to help the company locate the accessibility-related reviews [4]. We aim to understand what the current feedback methods are, in order to see what is currently functional and where there's space for new methods to be developed or current methods to be improved.

## **Method**

### *Interviews*

We conducted 11 interviews with developers and designers (Table 1). In our original study design, we had also included software testers; however, no software testers responded to our recruitment efforts. Two of our participants came from medium-sized companies (100-999 employees), three participants came from large companies (greater than 1000 employees), and the rest came from small companies. Four participants identified as having a disability or other chronic condition. For compensation, participants received a choice of a \$25 e-gift card or an equivalent donation to Associated Students Disability Outreach Center at Western Washington University. The interviews took approximately 30 minutes to 1 hour to complete. In the interview, we asked participants about their background in accessibility, their accessibility knowledge and how they use it in their job, current methods of getting accessibility feedback and gaps in current practices. Additionally, we asked about how they would communicate the level of accessibility of a website or application to users. The interviews were audio-recorded and then transcribed, removing personal identifiers such as name. Finally, we performed thematic analysis on the transcripts, where two researchers examined the transcripts, summarizing important points and identifying themes across the data.

### *Recruitment*

With input and approval from Western Washington University's Institutional Review Board, we designed a consent form which gave potential participants information about the study. If the viewer consented to participate, they would be directed to a page where they were asked for their contact information, current job description, and demographic questions. Once they submitted the form, they received a link to schedule an interview. If participants did not consent to participate, they would be taken to the page to end the survey. For the study, we required that the participants be User Experience Designers, Front-end Developers, or Software Testers. However, we did not receive any responses from Software Testers. We posted a recruitment message containing a link to the consent form to Twitter, Facebook, and specific accessibility and human-computer interaction related groups on Slack and Discord. In addition, we reached out personally to people in our networks that we thought would be a good fit for the study or knew people who might be interested. We used snowball sampling, where we requested that people that we reached out to, as well as study participants, pass their information along to peers that they thought would be interested in participating in the study. We recruited participants from April 2022 to June 2022.

**Table 1. Interview Participants**

ID	Gender, Age	Job Title	Educational Background
A1	Male, 29	Software Developer	bachelor's degree in unknown
B1	Female, 30	Senior Design Technologist	some college credit in computer science/no degree
C1	Male, 42	Senior Developer	some college credit/no degree, self-taught coder
C2	Nonbinary, 27	Software Developer	associate degree, coding bootcamp
D1	Male, 48	Full Stack Principal Designer	bachelor's degree in american studies
E1	Female, 25	Communications Specialist	master's degree in translation
F1	Female, 32	UX Designer	master's degree in human-centered design
G1	Male, 33	Senior Full Stack Engineer	master's degree in software engineering
H1	Male, 27	Visual Designer	master's degree in human-centered design
I1	Male, 28	UX Engineer	bachelor's degree in human-centered design
J1	Male, 48	Sr. Lead UX Researcher	doctorate degree in human factors engineering

## Findings

### *How Accessibility Knowledge is Acquired*

Of the participants, only 4 learned about accessibility during their post-secondary education. C2 was briefly introduced to accessibility in their post-secondary education, but attributed most of their accessibility knowledge to on-the-job experience, and utilization of online and physical resources. J1 also learned a little bit about accessibility in class, but also focused their master's thesis on accessibility and grew their knowledge during monthly meetups with peers also interested in accessibility. H1 worked with accessibility in class projects, then learned more through online and physical resources, while I1 worked on a capstone project where their advisors introduced them to accessibility.

Other participants cited helpful peers, online and physical resources, job experience, family members, and personal experience as the ways in which they were exposed to accessibility knowledge. When recalling how she'd learned about accessibility, E1 said:

*“When I started at [company], the person who did all of the accessibility for the [company], because the team was really small when I started, it was just three people. She did all the accessibility, she's been with the [company] for, like 25 years...she did all the accessibility work, but she was going to retire. And so we were going to lose all of that institutional knowledge. So I sat with her and worked with her on projects for months to learn how to do accessibility on the website.” -E1*

Some participants had learned about accessibility through multiple methods. The most common ways that people learned about accessibility was through the use of online and physical resources, through coworkers, school and through on the job learning (Table 2).

**Table 2. Methods of Learning About Accessibility**

Method	Number of Participants
Online and Physical Resources	6
On the Job Learning	4
Peers and Coworkers	4
Post-Secondary Education	4
Family Member	2
Personal Experience	1

#### *Feedback Methods During Development*

We found that developers and designers were utilizing many different methods to test for accessibility standards (Table 3). A common theme among participants was cross-team testing. E1, G1, and D1 referenced bringing their designs to coworkers to receive accessibility feedback, and giving feedback on coworkers' designs, describing how this prevented design blindness. B1 discussed hosting office hours, while D1 and F1 discussed office hours offered by design champions or other accessibility-knowledgeable coworkers to give accessibility feedback. In addition, F1 and H1 had companies or clients hire an outside consultant. In F1's case, the consultant created visuals of what the app would look like for people with different visual disabilities and in H1's, the consultant gave feedback related to the WCAG standards. B1

discussed how they were developing a checklist for designers to reference as they audited their design:

*“I’m working on right now...a checklist quiz kind of thing where if you’re a designer, and you’re creating a design, one of the final things that you do before you hand off, you know, your specs to an engineer, is you go through this kind of wizard style quiz, where it asks you questions like, have you checked the color contrast? Do you have images baked in? Do you have alt text? And it comes up with a recommendation of sort of like quick hit lists that you can check off to make sure that you’ve accounted for in terms of accessibility. So then that way, hopefully, the handoff process gets to be a little bit more tighter, because at the end of the day, we don’t have a dedicated accessibility team.”*

C2 also discussed having a checklist that they go through when developing or designing a product, mentioning manual testing, like using a screen reader on the application, and automated testing using an accessibility checker.

Participants also discussed user testing and interviews. B1, C1, C2, F1, and J1 discussed working with outside agencies to recruit participants for user studies. D1 described how their design process was iterative. They’d make a prototype, bring the prototype to target users, get feedback, improve the design and continue the cycle. However, C2, F1, H1 and I1 expressed that getting feedback from actual users with disabilities was an area that their company could improve upon, or was significantly more difficult due to lack of resources and time. This led researchers to be forced to make educated guesses about accessibility rather than actually consulting people with disabilities to get feedback.

**Table 3. Feedback Methods During Development**

Method	Number of Participants
Cross-Team Testing	3
Bringing in an Outside Consultant	2
Using Checklists	2
Educated Guesses	3
User Testing	4
Attending Office Hours	2

### *Feedback Methods During Maintenance*

Similarly to development methods, there was not a single standardized way participants received feedback after their application was deployed (Table 4). One feedback method employed was regular audits of the application every few weeks to make sure that there aren't any accessibility issues due to changes in the application or things that were missed. For the audits, similar to the checklists described in deployment, participants would go through the application using screen readers, automated accessibility checkers, and manually making sure forms are working. D1 and G1 also discussed the use of telemetry applications, applications that track mouse movement across a page and could tell the developer, for example, when a person was having difficulties navigating a particular section of the page or was having issues with the page layout, as a way to get less intrusive feedback from website users.

Participants discussed using forms and surveys to get feedback as well. E1 discussed how at their company it is required to have feedback mechanisms on the sites that they develop because they are in the education industry. On every site that they create, there's a dedicated accessibility page that has an accessibility statement and a method of filing a complaint if a person finds an accessibility issue on the site. B1 and D1 discussed using A/B testing on new features by choosing a control group to interact with the old version of the feature and an experiment group to test the new feature, receiving feedback and then making changes and evaluating the new feature accordingly.

**Table 4. Feedback Development During Maintenance**

Method	Number of Participants
Feedback Form	4
Automated Testing	5
Regular Audits	3
A/B Testing	3
User Testing With an Organization	5
Lawsuit	3
Telemetry Apps	2

### **Discussion**

One theme that emerged from the data was a lack of standardized accessibility education in post-secondary institutions. All participants discussed some form of ad hoc education, where they'd pieced together their knowledge through outside sources, rather than learning about accessibility

during their education. Although four participants discussed being briefly introduced to accessibility in school, they supplemented that introduction with other methods of learning. When accessibility education is not incorporated as a standard part of curriculum, many students will likely leave school with no exposure to the subject or knowledge that accessibility is an important consideration when developing a product or application. We believe that structuring accessibility knowledge in post-secondary education will lead to an increase in developers and designers incorporating accessible practices into their work, as well as a general awareness of accessibility, rather than having the bulk of the accessibility knowledge be limited to a few people in the company [2] .

Participants also discussed a desire for increased feedback of users interacting with their application, suggesting changes like more user tests and automatic feedback like telemetry applications or screen recordings be implemented into the product lifecycle. However, participants also stressed that barriers such as lack of time, money, and client enthusiasm currently prevented their company from obtaining feedback directly from users, leading the participants to be forced to make educated guesses.

Several participants discussed current accessibility statements that are displayed on their website, or accessibility statements that are currently being created, as a means to inform users about a company's commitment to accessibility. A participant discussed how they wanted to move their accessibility statement to a more prominent location on the site, in order to make users more aware that it existed. Accessibility statements should show a commitment to improvement of accessibility, rather than creating a promise that the site is, for example, 75% accessible, a metric that cannot be proven because the accessibility of a site is not a static entity. We suggest a prominent accessibility statement that is a commitment to improving the site, as well as including a way for users to submit accessibility feedback.

In summary, we make the following suggestions: (1) Increase research on accessibility education; (2) Incorporate more feedback mechanisms to show user interaction with websites; (3) Include a prominent accessibility statement on the application that includes a way for users to give accessibility feedback.

## **Conclusion & Future Work**

This study explores the current accessibility feedback collection methods of developers and designers. We found that designers and developers currently collect feedback in many different ways during the development and maintenance process. Based on our findings, we recommend increased research on accessibility education, the incorporation and development of methods that gather feedback on interaction of users with disabilities with the website or application and the inclusion of an accessibility statement in a prominent location. In the future, we would like to

expand this work to include a larger sample size, interview more participants from medium and large companies, and interview software testers.

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