

# **User Experiences of the General Population on Accessible Web Interface**

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## **Abstract**

There have been many lawsuits targeting organizations that have yet to make an effort to make their websites accessible to persons with disabilities. And hence, many vendors have started to make an effort in making their web interfaces accessible to persons with disabilities. Many research studies have also emerged, targeting user studies of persons with disabilities on the accessible web interface given the limitations of the Web Content Accessibility Guidelines (WCAG). Considering that the majority of the users comes from the general population, besides employing persons with disabilities, it is critical to also employ the general population in conducting user testing on the accessible web interface. However, existing literature on the perspectives of the general population on the accessible web interface is rather limited, in particular on individual accessibility features implemented according to WCAG. Obtaining the general population's insights on individual accessibility features is critical as it enables us to examine the individual accessibility features from the perspectives of the general population with a more critical lens. Our preliminary pilot user study findings suggest that the general population regard the accessibility features that they see as either (1) not relevant, (2) no effect or (3) helpful.

## **Keywords**

User Testing, Accessibility, Human Computer Interaction, Web Usability and Engineering Education.

## **1. Introduction**

Concerning the limitations of Web Content Accessibility Guidelines (WCAG) (Aizpurua et al., 2013, Power et al., 2012), the importance of rigorous user testing on persons with disabilities on accessible web interface have been emphasized. Aizpurua et al. (2013) states that a website that meets the success criteria on WCAG may not always be perceived to be accessible by persons with disabilities, and on the other hand, a website that violates majority of the success criteria on WCAG can be perceived accessible by persons with disabilities, in particular persons with visual disabilities. Considering the importance of user testing on persons with disabilities on the accessible web interface, various user studies concerning persons with disabilities such as studies by Aizpurua et al. (2016), Lopes et al. (2010), Bingham et al. (2007), and Petrie et al. (2004) have been conducted to evaluate the accessibility of the web interface. However, existing literature on the perspectives of the general population on the accessible web interface, in particularly perspectives of the general population on individual accessibility features implemented according to WCAG is rather limited. Harnessing the perspectives of the general population is critical as not only that they comprise the majority of the web users, but their perspectives have the potential to also assist in improving the accessibility features implemented for persons with disabilities. Since Hassenzahl (2005) suggests that people perceive the product's features before constructing a personal version of the product character, which is whether the product is good or bad, it is critical for us to also obtain the general population's insights not only on the accessible website as a whole but the individual accessibility features implemented according to WCAG as well. Our research question is thus "What are the perspectives of the general population on the individual accessibility features implemented according to WCAG?"

## **2. Method**

To eliminate bias in our pilot user study, we screen out participants who have higher technical expertise than the average users such as web developers or designers (Albert et al., 2010). Since the major goal of our pilot user study is to identify the most important usability problem of the general population on the accessibility features and to get preliminary qualitative insights, we employ 4 participants as the number of participants for our preliminary user studies as 3 - 5 user study participants are generally regarded as optimum in spotting major usability issues (Nielsen, 2012). The 4 participants were asked to perform user testing on the CATME (Ohland et al., 2005) peer review system. CATME is a website that provides team formation and peer evaluation tool to over 7,000 instructors and 200,000 students per month. We employ the tasks completion approach similar to user studies conducted by Aizpurua et al. (2016) on persons with visual disabilities in this preliminary user study. The participants were asked to conduct a series of tasks, including (1) create a team, (2) create an activity, (3) answering the team demographic survey, and (4) answering the peer-review survey on the existing CATME peer-review system with the absence of the to-be evaluated accessibility features and on the current CATME peer

review system with the presence of the accessibility features. Since the majority of the population does not have a solid idea on which features will regard as “accessibility features”, we let them navigate the existing CATME system without the accessibility features to be evaluated before navigating through the current CATME system with the accessibility features to be evaluated. Each of the 4 participants was asked to evaluate the 5 accessibility features implemented according to WCAG after completing the tasks on the existing CATME system without the accessibility features and the current CATME system with the accessibility features. The accessibility features that participants are asked to evaluate are WCAG success criteria 3.3.1 on “error identification” (Figure 1), WCAG success criteria 3.3.5 (Figure 2) on “context-sensitive help”, WCAG success criteria 2.4.4 on “link purpose” (Figure 3), WCAG success criteria 3.2.1 on “on focus” (Figure 4) and WCAG success criteria 2.4.3 on “focus order” (Figure 5). We used the modified system usability scale employed by Kortum and Bangor (2013) in their article titled “Usability Ratings for Everyday Products Measured with the System Usability Scale” where the participants will give us a rating between 1 to 5 where 1 indicates the accessibility feature was not useful at all to them and 5 indicates the accessibility feature was very useful to them. Additionally, the participants were allowed to indicate that the accessibility feature was not relevant to them if they did not use the particular accessibility feature during the user testing process. And lastly, the participants were asked to give us their user interface evaluations with the presence of the 5 accessibility features in comparison to the user interface without the presence of the 5 accessibility features on the system usability scale (Kortun and Bangor 2013) of 1 to 5.

### 3. Figures and Results

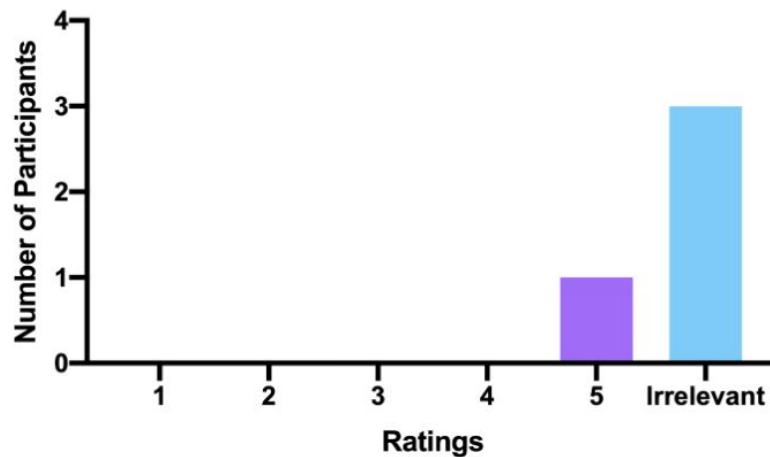


Figure 1: Number of Participants versus Ratings for Error Identification (WCAG Success Criteria 3.3.1)

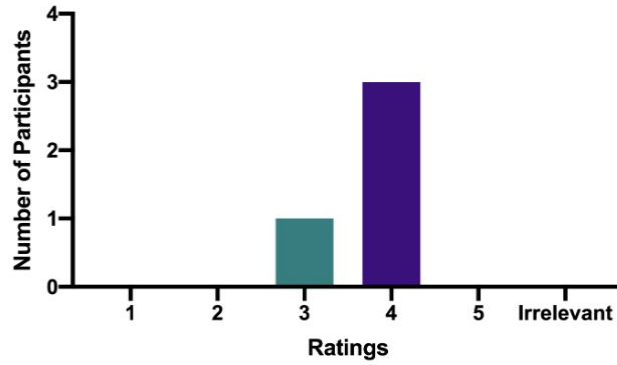


Figure 2: Number of Participants versus Ratings for Context-Sensitive Help (WCAG Success Criteria 3.3.5)

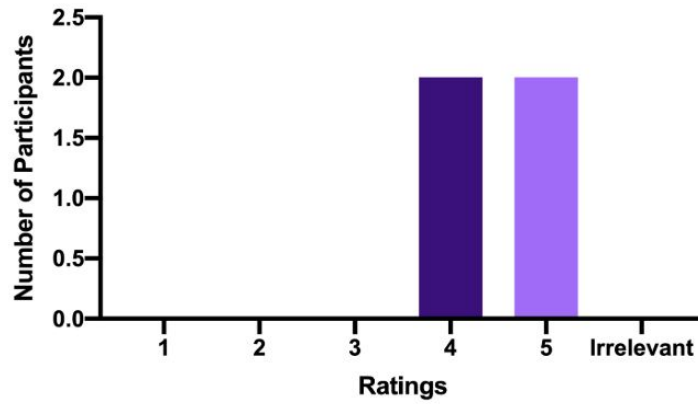


Figure 3: Number of Participants versus Ratings for Link Purpose (WCAG Success Criteria 2.4.4)

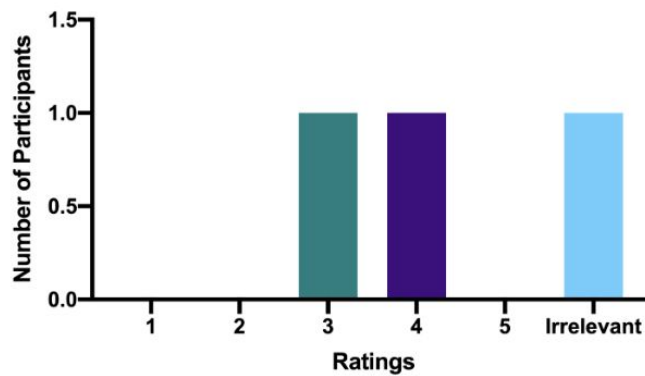


Figure 4: Number of Participants versus Ratings for On Focus (WCAG Success Criteria 3.2.1)

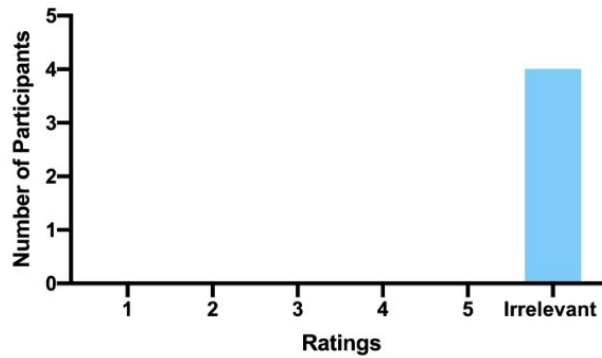


Figure 5: Number of Participants versus Ratings for Focus Order (WCAG Success Criteria 2.4.3)

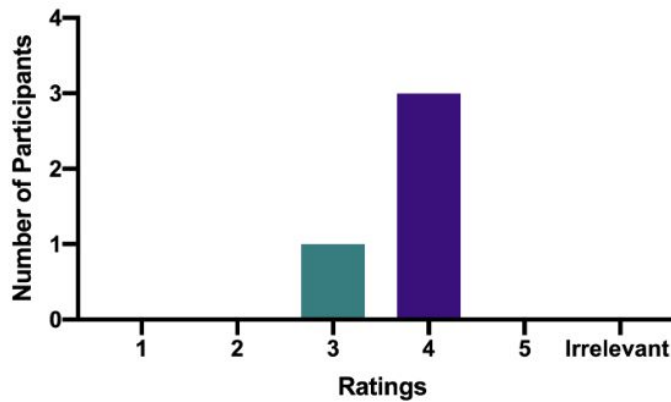


Figure 6: Number of Participants versus Ratings for Overall Usability Evaluations on CATME System with the Above Five Accessibility Criteria Implemented

Table 1. Mean and Standard Deviation of Rating for Each Accessibility Feature and Overall Rating on the System with the Five Accessibility Features Implemented

Accessibility Feature	Mean of Ratings
Error Identification (Figure 1)	5.00
Context-Sensitive Help (Figure 2)	3.75
Link Purpose (Figure 3)	4.50
On Focus (Figure 4)	3.33
Focus Order (Figure 5)	Irrelevant
Overall (Figure 6)	3.75

#### **4. Analysis and Findings**

Our analysis on the pilot user study results from the 4 participants suggests that their ratings on the five accessibility features of the CATME system can be classified mainly into (1) irrelevant (2) no effect or (3) helpful. This means that certain accessibility features catered to persons with disabilities can be beneficial to the general population as well. Accessibility features like “error identification” can be useful to the general population as well in the sense that if they encounter an error on the website, they would know the source of the error easily. Another accessibility feature that is regarded as helpful to the general population is the “link purpose” feature with a mean rating of 4.5 and the third most helpful accessibility feature on among all five accessibility features is “context-sensitive help”. From our pilot user testing study on the general population on accessibility features, we find that accessibility features that promote easier navigations will help the general population in navigating through the website as well. On the other hand, certain accessibility features do not affect the general population, as we hypothesize that those accessibility features might act as just “aesthetic” features to the general population such as the accessibility feature for “on focus” where the colors of the buttons change when the participants hover on them. There are also accessibility features that are regarded as “invisible” or “not relevant” to the general population such as the “focus order” accessibility feature as in general the general population doesn’t use the keyboard tab functionality to navigate the website but rather the use of mouse is preferred.

#### **5. Conclusion**

In essence, our pilot user testing study of the general population on accessible web interface seeks to inspire awareness in the human-computer interaction community that the insights of the general population may also be critical in advancing the accessibility features catered for persons with disabilities. Our work aims to advance the existing literature that focuses on employing persons with disabilities in evaluating accessible web interface and overcome the limitations of Web Content Accessibility Guidelines (WCAG). Human’s perspectives have long been seen as a valuable resource in improving usability, and hence, our research seeks to employ the perspectives of all in advancing the usability for persons with disabilities and also the general population. It is hoped that our pilot user study in utilizing the general population in evaluating accessibility features implemented according to WCAG will bring new perspectives to the user interface design community.

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