

# **But Can Users Find It?: Investigating the Navigation Usability of a School System's Information Website**

Nicholas S. Alexander  
Department of Educational Technology  
University of Hawai'i at Manoa  
Honolulu, Hawai'i  
nsalexan@hawaii.edu

**Abstract:** Website usability studies are a widely used procedure to assess a user-centered design by testing a website with its target audience. Usability studies provide a valuable insight into the thought process of website users, but due to the time and effort it takes to perform, usability tests are not pervasive in school-created websites. The usability study conducted for this paper was designed to investigate the navigation usability of a simulated, school-created system's information website designed for school teachers. The goal of the study was to create a more intuitive, user-friendly website that would be adopted by school faculty and staff. This usability study, which was held via Google+ Hangouts, and recorded with QuickTime, assessed participants' perceptions of the website while completing specific tasks. Upon completing the study, participants filled out an attitudinal survey which assessed the scenarios in the study, as well as provided an additional method of voicing proposed improvements to the navigation of the website. The study, which was conducted in two rounds with a revision period between them, revealed navigational flaws in the designed website and provided guidance in improving the website for future users. Increased user ratings after evaluating initial user ratings and implementing suggested website improvements suggest that usability testing for school information websites can prove beneficial for its users.

## **Introduction**

The use of resource websites in schools brings an opportunity for teachers, administrators, and students to streamline workflows, consolidate information, and improve record keeping, but its practical use is constrained by its navigation usability. According to Nielsen (2000), website users usually lack patience, and without effective navigation, the resulting frustration may result in the abandonment of the technology (Aldunate & Nussbaum, 2013). To combat the potential abandonment of websites, designers of the websites must approach their designs in a more user-centric manner and their designs should be based on the target users' behaviors (Handa & Hui, 2010). Usability testing is one way to assess a website is ascertainable, useful, and efficient.

The field of modern usability emerged around 1990 with the release of Shackel and Richardson's *Human Factors for Informatics Usability*. This book outlined how human

factors such as human-computer interaction affected the usability of information technology systems (Shackel & Richardson, 1991). Lewis, Polson, Wharton, and Rieman (1991) expanded on previous research regarding human-computer interaction by creating a cognitive theory of initial learning in human-computer interaction which developed questions to better evaluate a technology being tested (Lewis, Polson, Wharton, & Rieman, 1991). This work, along with other research, built the foundation of modern usability testing.

It has been widely observed that users expect a website's content to be practical, its presentation to be in line with users cognitive habits, and it be easy to use (Handa & Hui, 2010). According to Morville (2004), to assist users to find value in what you are providing, the website information should have seven key attributes. The information should be: useful, usable, findable, credible, accessible, desirable, and valuable. Usability testing is a major component in creating an effective, practical website which leads to a quality user experience.

This usability study examined a simulated school system's information website which was based on a website deployed at a high school in Hawai'i. The information housed on the website was intended to be used daily by employees at the school and included information such as: schedules, calendars, bulletins and request forms.

The purpose of this usability study was to investigate navigation improvements to this simulated school system's information website designed for high school teachers. Moreover, the goal of this usability study was to identify and implement improvements to the simulated school system's information website based on data collected throughout the two rounds of usability testing. Data gathered as a part of this study will be implemented in a live website in the future.

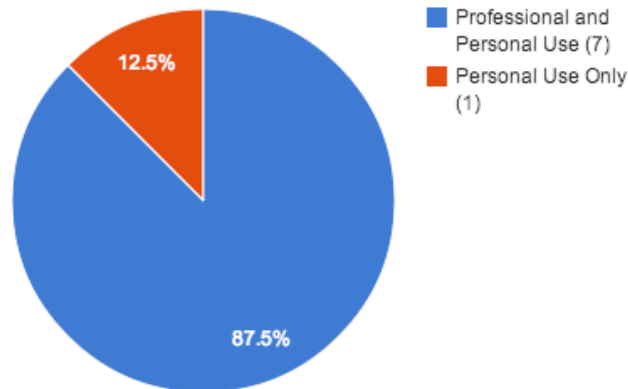
## **Methods**

### *Population*

Eight adults were selected to participate in the usability study. These participants were selected based on their general knowledge of school operations, and their availability during my usability study window. Participants were notified of their acceptance into the study by an informational email that included a consent form. Upon receipt of consent, a study time and location were scheduled.

Of these participants, four were male and four were female. Their age distribution included the following: 25-33 (62.5%), 34-44 (25%), and 45-54 (12.5%). Of the participants, three (37.5%) have completed a Master's degree, two (25%) have completed some graduate schooling, two (25%) possesses a professional degree, and one (12.5%) possesses a bachelor's degree. Most participants (75%) access the Internet from home, work, and mobile devices.

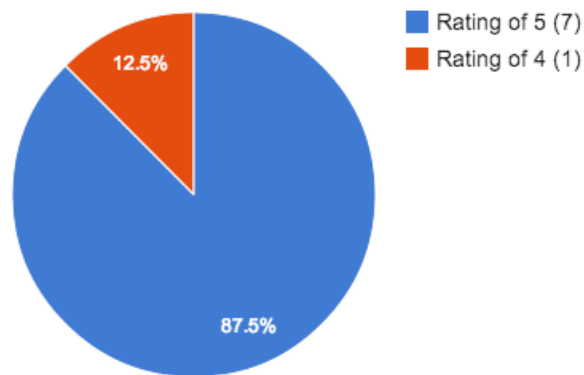
### How do you use the Internet?



**Figure 1.** Internet usage

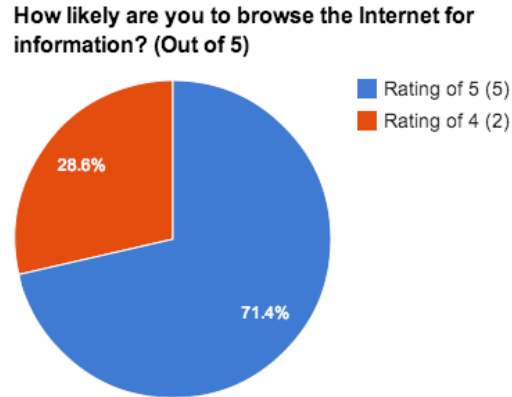
A majority of study participants (87.5%) use the Internet for both professional and personal purposes, and the remainder of participants (12.5%) uses the Internet for personal purposes only.

### How comfortable are you browsing the Internet? (Out of 5)



**Figure 2.** Comfort level using the Internet

The majority of respondents (87.5%) reported being very comfortable browsing web pages on the Internet. One respondent (12.5%) reported being fairly comfortable browsing web pages on the Internet.



**Figure 3.** Using the Internet to gather information

Many respondents (71.4%) reported that they were very likely to look to the Internet for information. Two respondents (28.8%) indicated that they were somewhat likely to look to the Internet for information.

Each of the two rounds of the usability studies had a participant population of two males and two females. These participants had varying educational and employment backgrounds but were all deemed qualified to participate as they were comfortable with using technology, the Internet, and Google Apps tools on their computers. Furthermore, the study participants were comfortable with the Concurrent Think Aloud (CTA), a method of usability testing where participants talk through their thought processes aloud while completing a task, and were able to share their feelings and perceptions about the test website candidly and openly.

### *Setting*

This usability study was designed to be conducted remotely. Using Google Hangouts as the primary meeting space, participants logged into the Hangout at a mutually agreed time. Another participation setting was face-to-face. If participants could not log into Hangouts, or if they desired to meet face-to-face, an area of their choosing with an Internet connection was used as the usability study room. Of the eight participants in this usability study, six participants participated at a distance and two participated face-to-face.

### *Materials*

To conduct this usability study, the researcher employed technologies from Google and Apple. Questionnaires were administered both before and after the study through a Google Form, which allowed for a fast and reliable data collection. Each Google form consisted of both qualitative and quantitative questions. The quantitative questions employed a five-point Likert scale, from 1 strongly disagreed to 5 strongly agreed.

Google Hangouts was used as a testing medium for remote usability tests. The study participants logged into a Hangout session and shared their browser window. Once the window was shared, the test website link was sent to the participant through the built in chat function and opened in the shared browser window. Once it was determined that the participant was ready and there was no personally identifiable information in the recorded browser window, the study began and was recorded with Apple's QuickTime 7.

Usability study sessions that were conducted face-to-face were identical to those conducted at a distance with the exception of the use of Google Hangouts as there was no need for an online meeting medium.

### *Design*

This usability study employed both the Concurrent Think Aloud and the Concurrent Probing (CP) methods of evaluation (Bergstrom 2013). Throughout the entire session, participants were encouraged and often reminded to think out loud. This CTA method allowed for the participants' thought processes to help me understand why they were completing tasks in the manner in which they did. While the participants were completing tasks, the CP method was employed to help to clarify or further gauge the perceptions of the participant. To avoid the possibility of interfering with the participants' thought processes, CP was only used once the CTA comments decreased, and the task was complete.

### *Procedure*

This study was conducted in two rounds throughout four weeks. During week one, four participants (M= 2, F= 2) completed the usability study. Using questions including "what would you expect to happen if you click on..." and "show me how you would do..." I gathered information on the participants' perceptions regarding the real life use of the website. The results gathered helped guide the improvements made to the test website during week two.

During the second week of the study, the results of the first week of usability testing were coded and analyzed. Revisions were then made to the navigational layout of the website. These revisions included the replacement of a title banner with a logo and the addition of drop-down menus to the horizontal navigation bar. Based on comments and perceptions gathered in the first round of tests, additional improvements were made to the website including re-listing sub pages in a more logical and intuitive manner.

Week three involved a second round of four usability tests (M= 2, F= 2). The questions used during this round of testing were similar to those of round one but included questions that focused on areas of concern identified in round one. Different participants were used in the second round of testing, and the methods used in week one were continued.

Week four was devoted to analyzing the data collected during the second round of testing and comparing it to the findings from the initial round of testing. This data was used to

measure the improvements made to the test website.

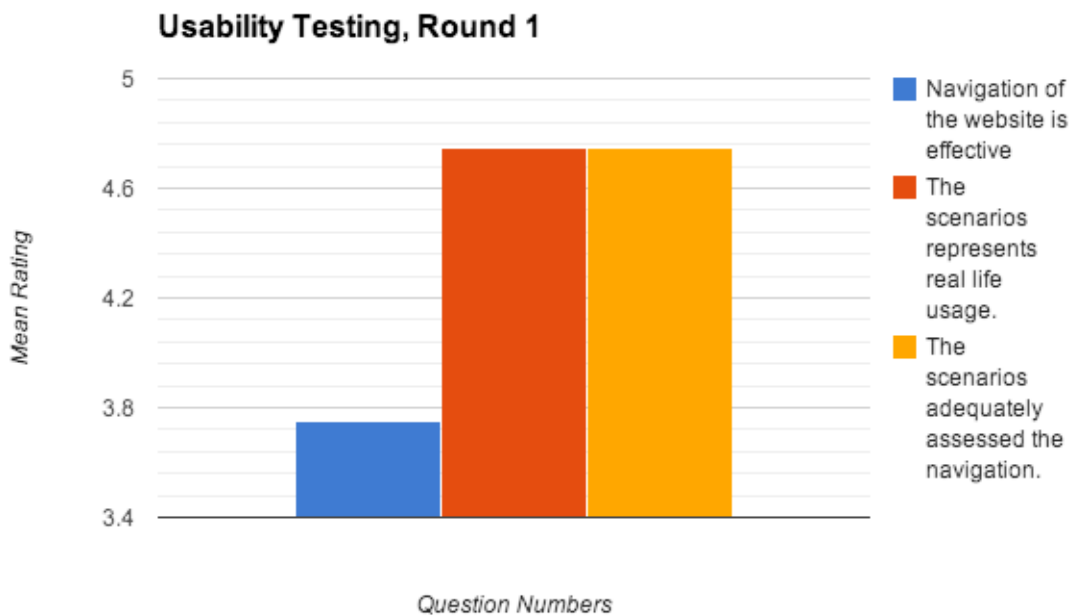
## Results

### *Quantitative Results*

The quantitative questions were presented to the participants in a Google Form at the end of the study. A five-point Likert scale, with five being strongly agree, and one being strongly disagree, was used to analyze and report findings using a mean rating.

### *Round One Results*

Based on the results of the post-study survey after round one of testing, 3 of 4 participants rated the navigation of the initial test website a 4, with the fourth participant rating it a 3, leading to an overall mean rating of 3.75 (n=4). The scenarios posed to the participants were perceived as representing real life usage for the website, with 3 participants rating this a 5 and the fourth rating it a 4, garnering a mean rating of 4.75. When asked if the scenarios adequately assessed the navigation of the website, 3 participants rated it a 5, and the fourth rated it a 4, with a mean rating of 4.75.



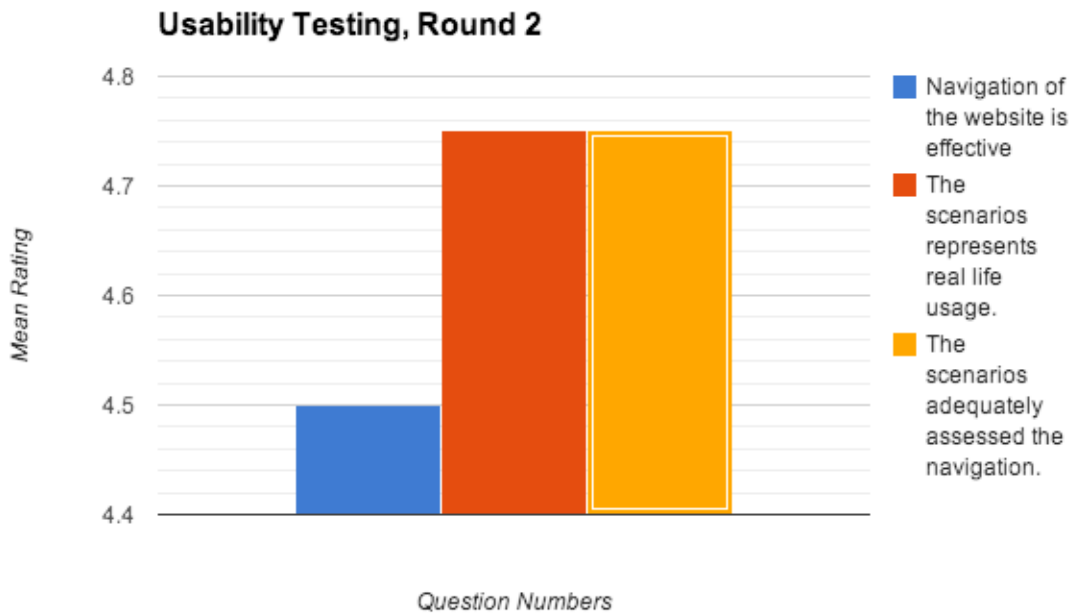
**Figure 4.** Mean ratings, round 1

The quantitative findings in the first round of testing indicated that participants rated questions two and three: relating to scenarios representing real life usage, and adequately assessing navigation of the website, as favorable. Participants rated question one, navigation of the website, less favorable indicating a need for improvement. Along with these findings, the qualitative data that was collected assisted in providing a clear view of

these findings, and its overall implications on the website.

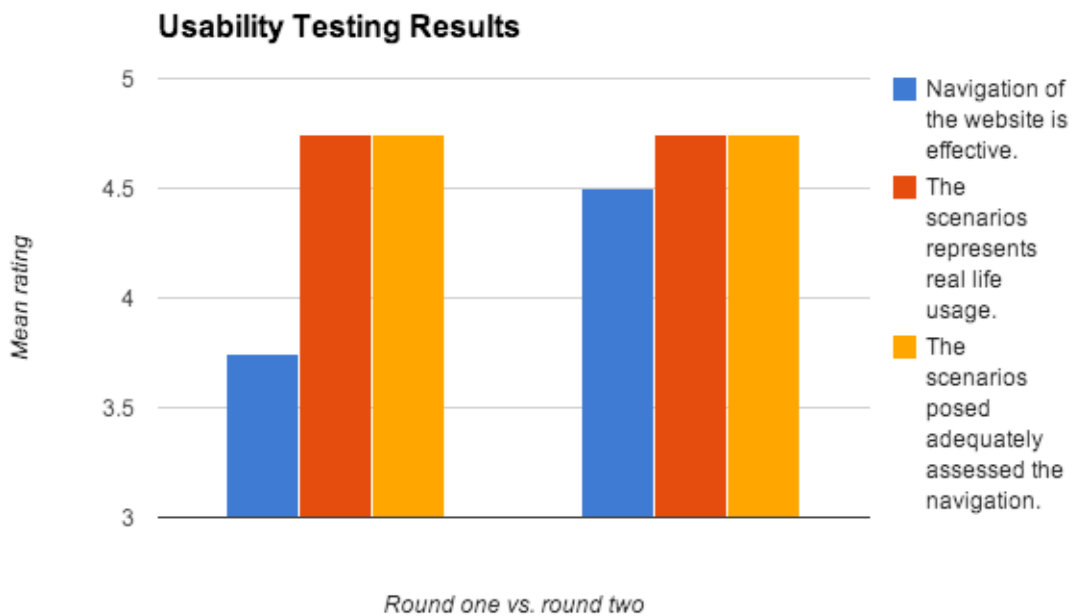
### Round Two Results

The second round of testing showed an overall improvement in the revised website. In the area of overall effectiveness of the navigation, the mean rating was 4.5, an improvement of 20% over the initial round of testing. The other two questions received an identical rating of 4.75 each.



**Figure 5.** Mean ratings, round 2

The quantitative findings in the second round of testing indicated that participants rated questions two and three identically to that of the first round of testing. Participants rated question one more favorably than the first round of testing indicating an improvement in the website. Along with these findings, the qualitative data corroborated with the quantitative data indicating an overall improvement of the website.



**Figure 6.** Comparison of both rounds

The overall results of both round one and two indicate an increase in the results of question one, with a mean rating increase from 3.75 to 4.5. Questions two and three indicated no changes with a mean rating of 4.75.

### *Qualitative Results*

Throughout the usability study, the participants were provided different opportunities to record their perceptions regarding the website. Comments were recorded during the study tasks itself through Google Hangouts and QuickTime 7, additional comments were solicited at the end of the study, and a post-study questionnaire was administered immediately following the study session. Finally, session notes with participant comments were recorded. All data were reviewed and summarized and grouped into three categories: General Design, Navigation and Labeling.

### *Analysis of Initial Testing*

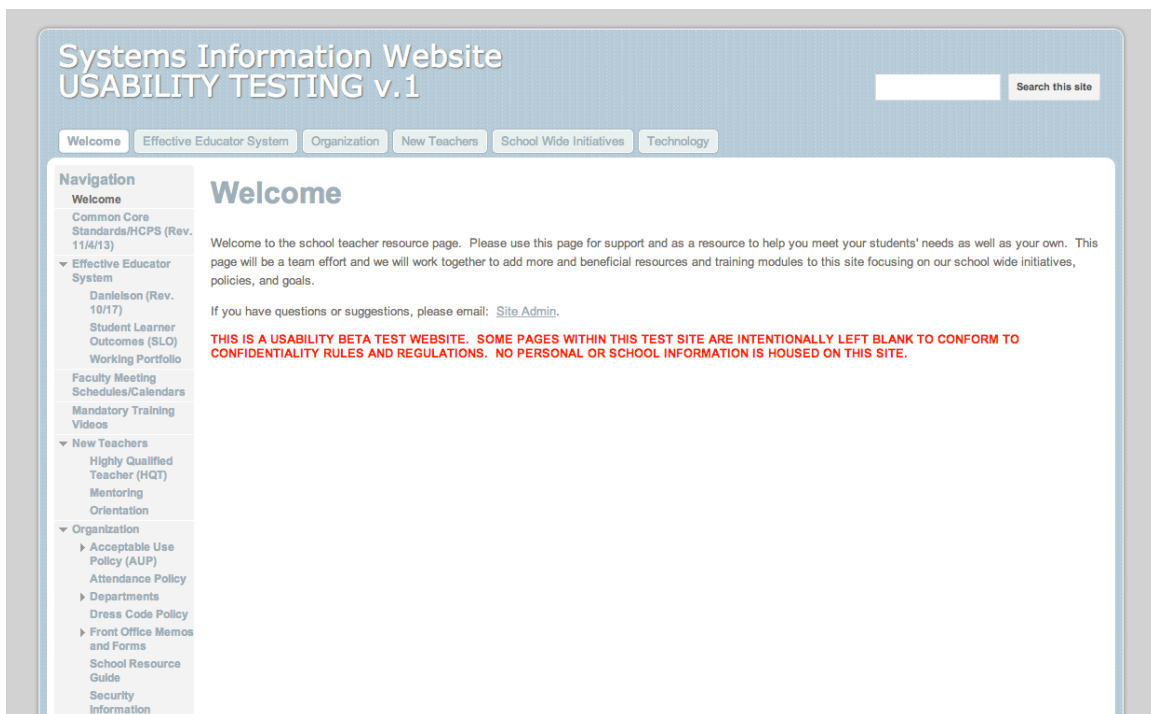
The findings indicated that in round one, the general design of the website needed improvements. Participants commented that the font was too small, the general layout, including open space on the website was not conducive to effective use, and the title banner did not fit on users' screens which led to the confusion of the website's purpose which can impact its use.

In the category of navigation, it was noted that the left navigation bar was too long which led to a feeling of being overwhelmed. Typical comments included: "there was too much scrolling needed" and "the open links on the navigation tree were not needed." There



was also a disconnect between the information on the horizontal navigation bar and the left navigation bar, with participants commenting, “information that can be found on the side (navigation bar) isn’t on the top (navigation bar)” and “why is it here (side navigation bar) but not there (top navigation bar).” Interestingly, although most of the participants said the left navigation bar was too long and somewhat overwhelming, most of them successfully used it to find information on the website, with one participant commenting, “the long toolbar on the side made it easier to look for information.”

The results in the category of labeling had two consistent themes, the labels were vague and they were not labeled intuitively. When asked why participants looked for information in certain areas of the web page, most participants responded that based on their knowledge of the information they were looking for, it belonged in the area where they looked. When the information was found elsewhere, participants voiced concerns that the labeling “did not make sense” and “sometimes vague or multiple meaning buttons (tabs/links) created confusing (sic) for me.” When tasked to find an email directory, one participant abandoned the task stating that she “doesn’t know where else to look.”



**Figure 7.** First version of test website.

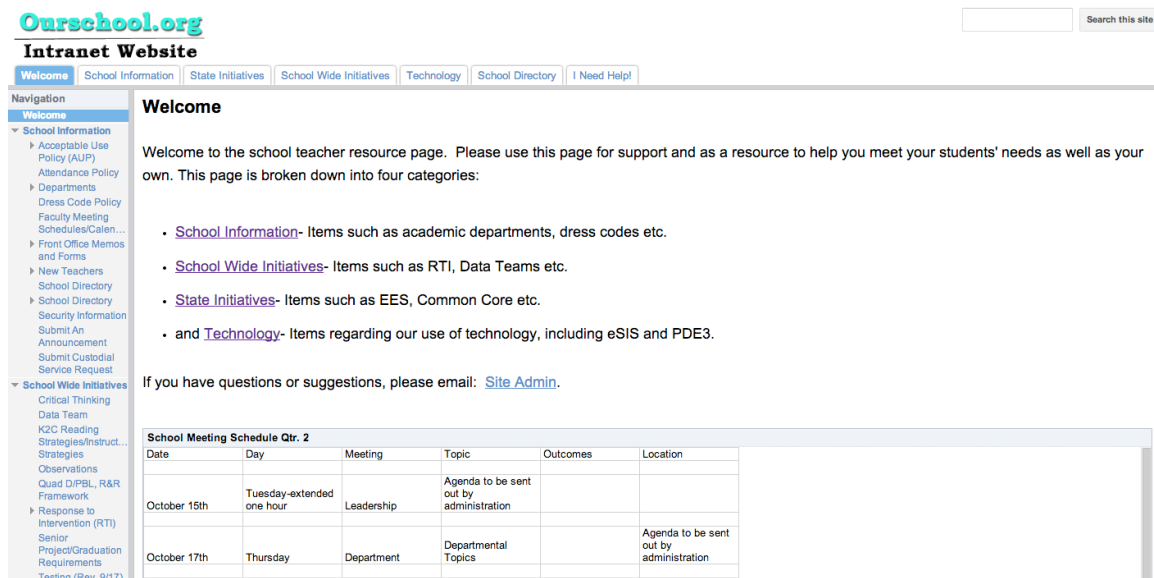
### *Analysis of the Second Round of Testing*

The results for round two were much different and showed many improvements. The findings indicated that after revising the design of the website including the elimination of a banner and addition of a .PNG name icon was useful as a home button. Furthermore, the new color scheme, while bland, did not take away from the website content. It was

expressed that the embedded document in the welcome screen did take away from the functionality of the website, commenting that “the frames (embed window) was not conducive to navigation.” This issue may be due to the website opening in a pop-up window which did not allow the use of a scroll bar. The participants who used the Firefox browser completed the usability study tasks by “scrolling” with their arrow keys.

The ratings addressing the navigation bars had also improved. User comments indicated that the addition of drop-down menus in the horizontal navigation bar was “helpful” and “made it easier to complete tasks.” Furthermore, the addition of the “School Directory” and “I Need Help” tabs were a welcomed inclusion to the navigation bar, as it made information “easy to find”, and that it was like a “911 for the website.” Unfortunately, due to the limitations of the researcher’s knowledge of Google Sites, the left navigation bar still remained open, leading to comments of it being too long.

The labeling category also saw a marked improvement in the second round of testing. All comments received pointed to an appropriate and intuitive labeling system on the website. The only confusion that occurred stemmed from my inability to name specific material titles in the scenarios posed to the participants.



**Figure 8.** Second version of test website.

## Discussion

The terminal objective for this usability study was to discover and implement potential improvements to the simulated school system's information website based on feedback from the test participants. The overall findings of the usability study yielded valuable and pertinent data sets that guided the improvements applied to the website.

The first iteration of the test website was very text heavy, and due to the limitations of the designer and the Google Sites application, basic design flaws such as automatic

navigation tree expansion and title wrapping hindered users' navigation of the site. Most of these flaws were fixed before the second iteration of the test website. Other technical issues, such as the unavailability of scroll bars on some web browsers also hindered tasks but were out of my control.

Despite the technical flaws, the study's findings and its associated improvements led to a faster task completion time and a better overall impression of the website. Moreover, it improved test participants' overall impression of the test website as a whole.

Unfortunately, there were limitations to the study. Due to the Hawaii Department of Education's (HIDOE) rules and regulations, authorization from the Data Governance Office (DGO) is required to conduct research using HIDOE personnel and resources. Although I applied for authorization in late November of 2013, the HIDOE DGO was quoting a minimum of six months for the process to conclude. Because of this, the simulated website was built and tested with non-HIDOE employees. Although it is beneficial to "recruit loosely and grade on a curve" (Krug, 2000), it would be beneficial to test the website using HIDOE employees, as the results will reinforce improvements made to the website which will benefit the users for which the website was actually designed.

Continuing research should be conducted in evaluating the actual effects of the improvements made from usability data, specifically in the area of school information websites. Continued monitoring of website use analytics may point to an increase in usage after implementation of improvements.

## **Conclusion**

It is my hope that this usability study serves to show its value to school website designers. By obtaining input from website testers, beneficial insight can be obtained regarding the perceptions of the website users. This insight may allow web page designers to improve their final product by making it more user centered, which can increase its adoption. Regardless of organization size and type, website usability testing can prove beneficial in creating a quality user experience for all who undertake it.

## References

- Aldunate, R., & Nussbaum, M. (2013). Teacher adoption of technology. *Computers in Human Behavior*, 29(3), 519–524.  
doi:10.1016/j.chb.2012.10.017
- Bergstrom, J. (2013, April 2). Moderating usability tests. [web log post]. Retrieved from <http://www.usability.gov/get-involved/blog/2013/04/moderating-usability-tests.html>
- Boutaba, R., El Guemioui, K., & Dini, P. (1997). An outlook on intranet management. *Communications Magazine, IEEE*, 35(10), 92-99.
- Dzida, W. (1995). Standards for user-interfaces. *Computer Standards & Interfaces*, 17(1), 89-97.
- Handa, M., & Hui, Z. (2010, August). Construction of high-availability teaching website. In *Management and Service Science (MASS), 2010 International Conference on* (pp. 1-4). IEEE.
- Krug, S. (2000). *Don't make me think!: a common sense approach to Web usability*. Pearson Education India.
- Lewis, C., Polson, P. G., Wharton, C., & Rieman, J. (1990, March). Testing a walkthrough methodology for theory-based design of walk-up-and-use interfaces. In *Proceedings of the SIGCHI conference on Human factors in computing system's* (pp. 235-242). ACM.
- Morville, P. (2004, June 21). User experience design [Weblog entry]. Retrieved from <http://www.semanticstudios.com/publications/semantics/000029.php>
- Nielsen, J. (1999). *Designing Web usability: the practice of simplicity*. Indianapolis, Ind.:

New Riders.

Shackel, B., & Richardson, S. J. (Eds.). (1991). *Human factors for informatics usability*.

Cambridge University Press.