

Evaluating Usability of a Teacher Resource Website

Janet Powell
Department of Learning Design & Technology
University of Hawaii at Manoa
Honolulu, Hawai'i, USA
powellj@hawaii.edu

Abstract: Adjust teaching practices to ensure student learning in the classroom is a part of everyday life as a teacher. Having students with disabilities in the classroom might make this a little more challenging. Private schools that do not specialize in these areas may not have the financial or physical means to provide enough support to teachers forcing them to do research on their own. The purpose of this project was to create a user friendly website that has information about learning disabilities, disability symptoms and teaching strategies. The website was created using Weebly, a web-based website builder. A usability study was conducted using 3 participants in the first round and 3 participants in the second round. Revisions to the website were made after the first round of feedback was analyzed and again after the second round. Revisions include adding a button that links users to a glossary page and a section on testing and diagnosing for each disability covered.

Introduction

The goal of any educational program is to help students maximize their performance. For many students with disabilities, the environment in which to achieve this outcome is under continuing debate and sometimes diminishes the likelihood of achievement (Obiakor, 2012). Private schools that don't specialize in these areas may not offer much support or even grant admission to students who struggle with certain issues (Tucker, 2015). Smaller independent schools may not have the resources to assist teachers in the classroom resulting in teachers seeking out information on their own. The school that I currently work for has no special education teacher despite the number of students with disabilities. Teachers have expressed the need for this position, however it's not in the budget this year. To better assist my students with various disabilities, I've had to seek information such as general information, symptoms, and teaching strategies by looking at a multiple websites. I've created a teacher resource website that has all this information in one location. In order to make my website successful, I've conducted a usability study to assess the ease-of-use and user satisfaction of a website containing information about different disabilities with corresponding teaching strategies for K-12 teachers at a private school on Kauai.

Literature Review

Since almost five percent of all students in our nation's public schools are classified as having specific learning disabilities, every teacher can expect to find students with learning disabilities in the classroom (Learning Disabilities Association, 2015). The key to success in the classroom lies in having appropriate adaptations, accommodations, and modifications made to the instruction and other classroom activities (Center for Parent Information and Resources, 2010). The need adjusting instruction can apply for all students. The use of teaching strategies for students with disabilities is an ongoing topic for studies as educators come up with new strategies and new technology arises. A lack of resources to support identification and teaching students with specific needs is a problem in schools. Parent and professional collaboration was central to what could be defined as 'good practice' (Brown and Bell, 2014). Professional development, though well intentioned, is often perceived by teachers as fragmented, disconnected, and irrelevant to the real problems of classroom practice. Less than half of National Board certified teachers are satisfied with the quality and quantity of professional learning opportunities available at their school (Lieberman, 2008). Technology and the World Wide Web has made it possible for us to have this information at our fingertips. There is no research on how often teachers actually use websites to locate information on things such as classroom strategies and intervention but there is a significant amount of different websites on disabilities.

Website quality consist of five factors: connectivity, information quality, interactivity, playfulness, and learning. The results suggested that these five factors had positive impacts on the user (Chiu et al., 2005). Inferring Student Learning Behaviour From Website Interactions (Sheard et al., 2003) was a study in which educators found out that the way their students were using the website was different from how they initially intended it to be used. This study does not determine if the user has learned specific content however, the usability study ensures that the website is user friendly so that they can find the actual information needed to be learned. Other usability studies conducted by Becker and Yannotta (2013) had four rounds of testing with five participants per round with a think-aloud protocol however, I followed the Steve Krug model of only have three participants per round with only two rounds of testing. Both models are aimed to determine the effectiveness of websites and reveal information seeking habits.

Project Development

The two research questions for this study were one, how do teachers rate the ease of use in completing the tasks requested during the usability test of the teacher resource website and two, how satisfied are teachers when using the website. The purpose of the testing was to identify areas of focus that can be used to improve the website.

The website, <http://usingourabilities.weebly.com>, was created using a browser website creator called Weebly. This website editor allowed me to create my own layout and it's drag and drop features made it easier to make needed changes after the first round of testing in a short amount of time (see Appendix A, all Figures). The original website included some background information on the specified disability, symptoms, and strategies to use in the classroom. After the first round of testing a button was added to make the website easier to use and information about testing and diagnosing was added for user satisfaction. The disabilities highlighted on this website were chosen due to the amount of students who have them at Island School. Pertinent information for each disability was collected from a variety of

websites and compiled into one location. Information on the website was reviewed by the school's part-time learning specialist who acted as the subject matter expert (SME).

Other instruments implemented in this usability study were the pre and post study surveys using Google Forms with questions using the likert-scale and open-ended questions (see Appendix B). Answers are automatically transferred into a spreadsheet allowing for the results to be analyzed more efficiently. The pre-survey and post survey of questions collected data pertaining to demographics, experience, technology use, website design, and the users' experience in using the site. Surveys were created

Methodology

The target population for this usability study were current Island School teachers of varying ages with a wide range of technological skills. A total of six participants were used, three for the first round and three for the second round. There was an extra participant in the first round but their information was omitted due to technical difficulties during the actual usability study. According to Krug (2011), the first three users are very likely to encounter many of the most significant problems.

Once a paper copy of the Informed Consent Form (see Appendix C) was signed, participants were emailed the pre-study survey along with the scenarios used in the usability study. In order to protect the rights of my participants the data taken from their participation was used solely for the purpose of this study. The data is being stored securely on a password-protected computer and will be permanently deleted once the research is complete and presented at the Technology, Colleges and Community Worldwide Online Conference (TCC Online Conference). The recordings from this study were transcribed to determine commonalities from all participants.

During the usability study, participants were given two scenarios. The first scenarios is that you have a new student in your classroom and have been notified that the student has dyslexia. The parent mentions the term IDEA and you have no idea what this means but would like to find out what they are talking about. The second scenarios is that your student with ADHD is having trouble completing tasks given in class and you are looking for some strategies to use and implement. Volunteers had the option of participating in one of the two ways as preferred by the participant: 1) moderated testing completely online through Google Hangout with the researcher with the participant using their own computer and internet connection, or 2) moderated in-person at a mutually agreed upon location using their own computer or using one that is provided by the researcher. I had two participants do the study online using Google Hangout and four complete it in person using Quicktime. For both rounds of testing participants were asked to navigate through the teacher resource website given the scenarios described above and asked to think aloud as they complete the tasks. Screen activity and audio was recorded, but no recognizable images of the participants themselves was captured.

Following each of the two rounds of usability testing, qualitative and quantitative data was collected to identify serious difficulties and the most significant issues by looking at frequency of occurrence and impact on user experience. Revisions were made to address areas of improvement and resulted in the following three iterations of the website: original website, edited version after the first round of testing, and the final website after the second round of testing.

Table 1. Background information on usability study participants.

Participant	Usability study round	Age group	Self-assessment of computer use	Time spent on internet per week	Device most used to access internet	Activities on internet
1	1	40-49	Proficient	15 + hours	Desktop/Laptop	Work, News
2	1	30-39	Proficient	3-6 hours	Mobile	Education-related, Email, Social Media, Shopping, Entertainment
3	1	21-29	Proficient	15 + hours	Mobile	Education-related, Email, Social Media, Shopping, News, Entertainment, Information Search
4	2	60 +	Competent	11-14 hours	Mobile	Education-related, Email, Social Media, Shopping, News, Entertainment, Information Search
5	2	21-29	Proficient	15+ hours	Desktop/Laptop	Education-related, Email, Social Media, Shopping, News, Entertainment, Information Search
6	2	21-29	Proficient	15+ hours	Desktop/Laptop	Education-related, Email, Social Media, Entertainment, Information Search

Results

Participants completed two task scenarios using the teacher resource website. After round one, the researcher reviewed the computer screen recording to calculate the time each participant took to complete the two scenarios. This information is shown in Table 2.

Table 2. Time in minutes and second for Round 1 to complete tasks

Participant	Task 1 - Find out what the term IDEA means for a student with Dyslexia	Task 2- Find teaching strategies for a student with ADHD
1	19 seconds	39 seconds
2	54 seconds *	25 seconds
3	32 seconds	39 seconds
Overall average	35 seconds	34.33 seconds

*Did not complete task

Following round 1, participants were verbally asked if they would recommend this website to other teachers and all three participants agreed that they would because it had helpful information. One participant discussed the idea of having the information condensed into one website and one participant said it was easy to navigate because the layout was simple. After the usability study participants completed a post survey that included Likert scale (1-strongly disagree and 5- strongly agree) and open ended questions about navigation and user-satisfaction. The information from this survey is included in Table 4 and 5.

Changes were made to the website between rounds of testing. First, I changed the title from “Island School” to “Teacher Resource”. I added a button at the bottom of each disability page that linked to the glossary page. I added a instruction section notifying the user that the blue bottoms would take them to an external website on the homepage. Some statistics and testing and diagnosing information about each disability was also added to the website. While doing this I tried to eliminate any unnecessary information in other sections so the amount of writing remained reasonable.

Round 2 participants were given the same task scenarios. Table 3 shows the amount of time it took each participant to complete the scenarios. Again, all three participants agreed that they would recommend the website to other teachers. Participant 1 expressed that they liked the topbar navigation as well as the importance of the information for teachers at our school. Participant 2 appreciated the information provided and thought the website could be used for parents as well. Participant 3 expressed the importance of this site for new teachers with little experience using different strategies.

Table 3. Time in minutes and second for Round 2 to complete tasks

Participant	Task 1 - Find out what the term IDEA means for a student with Dyslexia	Task 2- Find teaching strategies for a student with ADHD
1	17 seconds	15 seconds
2	1 minute 17 seconds	1 minutes 59 seconds

3	18 seconds	18 seconds
Overall average	37.33 seconds	50.66 seconds

Table 4. The average(mean) results from post survey Likert scale questions for both rounds of testing

Question	Round 1	Round 2
1. The website is visually appealing	3.33	4.6
2. The test is clearly written	4	5
3. The images are interesting	3	4
4. The organization of the site is logical	4	5
5. The website was easy to navigate	4	5
6. Number of buttons and links are reasonable	4.33	4.66
7. Links are consistent and easy to identify	4	4.33
8. The website is user-friendly	4.33	4.66
9. The website has a clean and simple presentation	4.33	5
10. The information on the website is useful	4	5
11. It is easy to find information on the website	4	4.66
12. I was able to complete the task in the study easily	4	5
13. The website is effective in providing instructional strategies to students with disabilities	4	4.66

Table 5 Results from open-ended questions for both rounds of testing

Question	Round 1	Round 2
What did you like most about the website?	<ul style="list-style-type: none"> - Simple - Just enough information - Easy to navigate 	<ul style="list-style-type: none"> - Clean, not too many clicks - Clear information - Welcoming and friendly
What suggestions for improvement do you have?	<ul style="list-style-type: none"> - Add a button for glossary at the end of the page - Remove Island School as title or add "teacher resource" so people don't think it's the official Island School website - Add information about testing and diagnosing 	<ul style="list-style-type: none"> - Flashier title - Expand content (add more disabilities to the site) - Change picture on homepage to a more multicultural picture. - Change titles for the sections on each page
Do you have anything else you wish to share?	<ul style="list-style-type: none"> - Add statistics about disabilities - Liked the videos 	<ul style="list-style-type: none"> - Great website - Extremely useful

		- Liked the glossary
--	--	----------------------

Discussion and Conclusion

The simplicity of the website and general layout of the content on the page worked well for all of the participants. Positive reviews were made by all participants, specifically about how useful this website would be for teachers. The average score for the post survey questions went up by one after the first round. Most of the suggestions made during the second round were more about aesthetics versus clarity. For example, in the first round the participants suggested changing the title so that users don't think it is the actual school website and adding a button while the second round participants suggested making flashier titles.

One participant in the first round did not complete the task that asked them to find the term IDEA for a student who has dyslexia. The participant explained they were looking for words that were bold or italic but couldn't locate it so they would then watch the video. This particular participant suggested having a link to the glossary page for each disability. This was useful as two participants in the second round used that button.

Another participant in the second round took significantly longer to complete both tasks. For the second task the participant was looking at the correct spot but was not reading the section title so they did not make the connection. A button was used and caught the eye before the user could read the title of that particular section. This participant is older in age and only rated themselves as competent in internet use despite the fact that they spend a significant amount of time browsing the web. This particular participant also expressed being exhausted from the day's events.

When considering the findings of this usability study, I would do further research to see if the amount of time it took to complete the task had a correlation to age and time of day. Making a website that is easy to use for everyone despite their age and self assessment of computer use is key. Making sure that time of day is irrelevant is also important as teachers will most likely use this website after school. By doing this teachers will be more likely to use the website as a resource and transfer the information into their teaching practices thus helping out the most important person involved, the student.

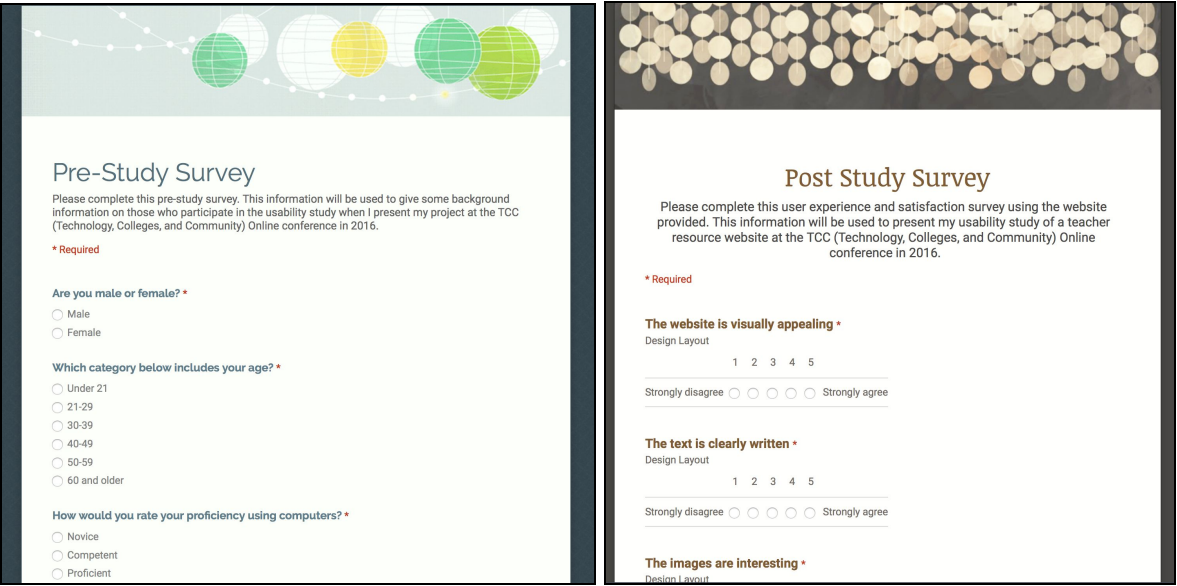
References

- Becker, Danielle A., and Lauren Yannotta. "Modeling a Library Web Site Redesign Process: Developing a User-Centered Web Site through Usability Testing." *ITAL Information Technology and Libraries* 32.1 (2013): n. pag. Web.
- Brown, Julian, and Sheena Bell. "Supporting Young People with Dyslexia in International Schools: a Case Study Example of Current Provision in Southeast Asia." *Support for Learning* 29.2 (2014): 154–166. Web.
- Cebi, Selcuk. "Determining Importance Degrees of Website Design Parameters Based on Interactions and Types of Websites." *Decision Support Systems* 54.2 (2013): 1030–1043. Web.
- Chiu, Hung-Chang, Yi-Ching Hsieh, and Ching-Yi Kao. "Website Quality and Customer's Behavioural Intention: an Exploratory Study of the Role of Information Asymmetry." *Total Quality Management & Business Excellence* 16.2 (2005): 185–197. Web.
- Krug, Steve, and Vanja Walsmit. *Rocket Surgery Made Easy: Verder Met Usability*. Zaltbommel: Thema, uitgeverij van Schouten & Nelissen, 2011. Print.
- Lieberman, A., & Mace, D. H. P. (2008). Teacher learning: The key to educational reform. *Journal of teacher education*, 59(3), 226-234.
- Sheard, Judy et al. "Determining Website Usage Time From Interactions: Data Preparation And Analysis." *Journal of Educational Technology Systems* 32.1 (2003): 101–121. Web.
- Smith, A. L. et al. "Pilot Physical Activity Intervention Reduces Severity Of ADHD Symptoms in Young Children." *Journal of Attention Disorders* 17.1 (2011): 70–82. Web.

Appendix A: Weebly Website



Appendix B: Pre and Post Survey Forms and Questions



Pre-Study Survey Questions

Are you male or female?

Male

Female

Which category below includes your age?

Under 21

21-29

30-39

40-49

50-59

60 and older

Have you taken any special education classes?

Yes

No

How would you rate your proficiency using computers?

Novice

Advanced beginner

Competent

Proficient

Expert

On average, how many hours do you spend using the internet a week? (not including Renweb)

Less than 3 hours

3 - 6 hours

7 - 10 hours

11 - 14 hours

15 or more hours

How do you usually access the internet?

Desktop/Laptop Computer

Mobile Device (tablet, iPad, smartphone)

Other

What do you do on the internet? Check all that apply

Education-related

Email

Social Media

Shopping

News

Entertainment

Information Search

Other: ____

Post-Study Survey Questions

1 - Strongly disagree

2 - Disagree

3 - Neutral

4 - Agree

5 - Strongly agree

Design Layout

1. The website is visually appealing
2. The text is clearly written
3. The images are interesting
4. The organization of the site is logical

Navigation

1. The website was easy to navigate
2. Number of buttons and links are reasonable
3. Links are consistent and easy to identify

Ease of Use

1. The website is user-friendly
2. The website has a clean and simple presentation

Effectiveness

1. The information on the website is useful
2. It is easy to find information on the website
3. I was able to complete the tasks in the study easily
4. The website is effective in providing instructional strategies to students with disabilities

Overall Experience

Design Layout

- 1- Very confusing
- 2- Confusing
- 3- Neutral
- 4- Clear
- 5- Very clear

Navigation

- 1- Very difficult
- 2- Difficult
- 3- Neutral
- 4- Easy
- 5- Very easy

Ease of Use

- 1- Very difficult
- 2- Difficult
- 3- Neutral
- 4- Easy
- 5- Very easy

Effectiveness of website

- 1- Not effective at all
- 2- Somewhat not effective
- 3- Neutral
- 4- Effective
- 5- Very effective

What did you like most about the website?

What suggestions for improvement do you have?

Do you have anything else you wish to share?

Appendix C: Informed Consent

Informed Consent

My name is Janet Powell. I am a graduate student at the University of Hawaii at Manoa in the College of Education. I am doing a research project as part of the requirements for earning my Master's degree in Learning Design and Technology. The purpose of my project is to evaluate the ease of use and user satisfaction of a teacher resource website.

Activities and Time Commitment:

Participation will be online using Google Hangout with your own computer and internet connections or in-person using a provided computer with internet connection at Island School. If you participate, you will be asked to navigate through the teacher resource website while being prompted by a series of scenario questions. The questions are intended to evaluate the ease of use and user satisfaction of the website. You will be asked to share your thoughts out loud as you navigate the website, which will assist researchers in gaining further insights into the user experience. Your actions and verbal comments will be screen captured and recorded using Google Hangouts or QuickTime. Once all scenarios are completed, the researcher may ask follow up questions as needed. You will be asked to complete a pre-study survey before the usability test and a user satisfaction survey after participating. The user satisfaction survey is

intended to gather attitudinal feedback pertaining to the ease of use and effectiveness of the website as a whole. The entire usability study, including both surveys, will last about 45 minutes.

Voluntary Participation: Your participation in this project is voluntary. You may withdraw from participation at any time.

Privacy and Confidentiality: The data taken from your participation in this study will be used solely for the purpose of this usability study. The data will be stored securely on a password-protected computer. When I report the results of my research project, I will not use your name or any other personal information that would identify you. The recordings from this study will be transcribed to determine commonalities from all participants. Once the research is complete, all recordings will be destroyed.

Questions: Please contact me, Janet Powell, at (808) 212-8072 if you have any questions regarding this project. You may also contact my professor, Peter Leong at peterleo@hawaii.edu or (808) 956-3902. If you have questions about your rights as a research participant, contact the UH Committee on Human Studies at (808) 956-5007 or via email at, uhirb@hawaii.edu

Agreement to Participate in

Usability of a Teacher Resource Website

"I certify that I have read and that I understand the information in this consent form, that I have been given satisfactory answers to my questions concerning the project, and that I have been told that I am free to withdraw my consent and to discontinue participation in the project at any time without any negative consequences to me.

I herewith give my consent to participate in this research project with the understanding that such consent does not waive any of my legal rights."

Printed Name of Participant

Signature of Participant

Date

Please initial next to either "Yes" or "No" to the following:

I consent to be audio-recorded for the interview portion of this research.

_____ Yes _____ No

Note: A copy of this consent form will be scanned and placed in your school mailbox