Examining the Usability of a Video Technology Website for School Support Staff

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Abstract: As a top-ranking state for videoconferencing penetration, Hawaii’s public school system maintains over 300 endpoints and a multipoint conferencing bridge, requiring quality support and maintenance. However, budget cuts throughout the system have offices relying on websites as a means of internal and external communication. The Video Technology website was created to provide additional knowledge and resources available for school support staff to supplement onsite technical assistance by a videoconferencing technician. The purpose of this usability study is to evaluate the ease of use and organization of this website and its ability to assist public school support staff with providing basic technology support information. The goal of this study was to create an inviting, easy to use website while maintaining quality, trustworthy information. Revisions over two rounds of testing revealed initial navigational errors and aesthetic suggestions to improve future deployment. Consistent use of additional navigational features such as breadcrumbs and a secondary menu confirmed these as necessary tools for future web design.

Introduction

Large budget cuts, internal reorganizations, and changing personnel for Hawaii’s public school system have offices relying on websites to relay information and documents (“Hawaii DOE Home Page,” n.d.). The reorganization of a state office providing curriculum and student support separated videoconferencing (VC) and video production, known collectively as the Video Technology Group (VTG). VC and video streaming support relocated while video production crew and support remained.

School support staff, comprising mainly of school technology coordinators and office assistants, rely on VC technology for support and information. On-site VC technical support staff also provides for necessary repairs, maintenance, equipment, and requests when remote support is not sufficient. The video technology website provides additional knowledge and resources available for school support staff. As new resources were added, web pages and online documents on the video technology website gradually became outdated and disorganized over the last 10 years. A redesigned, easier to use website was used for this usability study.
The purpose of this study was to evaluate the ease of use and organization of this redesigned website providing video technology resources in its ability to assist public school support staff with providing basic technology support information. The goal was to provide an appropriate, user-friendly, organized website which school support staff can refer to for additional knowledge and documentation on videoconference support and services. Participant feedback from this usability study will be used for future implementation of the live website.

**Literature Review**

Data collected from videoconferencing providers indicate that Hawaii and Alaska are top states for videoconferencing penetration due to their geographic isolation. Over a three-year period from 2006-2009 there was approximately a 31% growth of classroom-based videoconferencing across the states. In addition to the general increase, this study noticed states shifting to using scalable server-based web conferencing, more suited for desktop and individual applications (Greenberg & Wainhouse Research, 2009). This indicates Hawaii as a large provider for videoconferencing services.

In addition to providing services, this creates a need for organization and structure for providing information and resources to the users regardless of the means of communication and multiple devices for videoconferencing. According to a study surveying 4,737 videoconference respondents from around the world, users are no longer forced to operate a videoconferencing room (Weinstein & Nilssen, 2013). There is additional flexibility in being able to use their PC, notebook, smartphone, tablet, or other videoconference-enabled device (p. 14).

A multitude of factors need to be taken into consideration for successful classroom-based videoconferencing, the content of this website (Anastasiades, 2010). Knowledge of VC technologies from the infrastructure back-end as well as the users' front-end can create optimal learning and collaborative environments.

Websites organized hierarchically and systematically create structured landscapes for users to predictably navigate through the increasing amount of digital information. From the late 1980s, research was devoted to deciphering human-computer interaction (HCI). In the adaptationist approach, users are viewed "as complex adaptive agents who shape their strategies and actions to be more efficient and functional with respect to their information ecology" (Pirolli, 2003).

Educational websites, whether enhancing learning or providing support, should emphasize user browsing experience. Many factors were taken into consideration in redesigning the website such as mobile or smartphone usage, appropriate navigation system, color, font, and text usage (Baturay & Birtane, 2013, Ng, 2014; J.M. Pearson, A. Pearson, & Green, 2007; Rosen & Purinton, 2004; Seckler, Opwis, & Tuch, 2015).

In a study exploring web master's perceptions of website quality, Sorum, Andersen, and Clemmensen (2013) found that information quality was a driving force in influencing repeat visitors. The study focused on award-winning Norwegian government websites that fall into 4 categories: (1) the inviting website, (2) the intuitive website, (3) the easy to use website, and (4) the simple website. Each category emphasized aesthetics, information, and ease of use to varying
degrees. Regardless of website category, the information should be usable, trustable, and also easy to find, noting that usability studies are a larger key factor in website quality. Current research also shows that fact-based sites such as educational, e-commerce, financial, entertainment, government, and medical sites need to contain information that is well-researched and transparent (Hasan, 2012; Huang & Benyoucef, 2014).

According to Steve Krug (2006), “People won’t use your Web site [sic] if they can’t find their way around it” (p. 104). Webpages should be self-evident and self-explanatory leading users to their expected destinations. Little time is spent reading webpages, instead we scan them (p. 56). Users focus on keywords and phrases that stick out to them, whether it is what they are meaning to look for or not. Krug uses the word *satisficing*, a cross between satisfying and sufficing, when users chose the first reasonable option, not the best option. Satisficing is efficient and there is no penalty for guessing wrong. This means that since users simply want to find the information faster, the website design should accommodate user scanning ability.

Features such as breadcrumbs and tabs assist users in navigating the website. A search bar can also aid navigation, however as current research shows results may be much lower than expected on search bar usage on an educational website (Çetin, & Özdemir, 2013).

Website usability allows for quantitative and qualitative data feedback (Bergstrom, 2013; Krug, 2006; Krug, 2011; Rubin & Chisnell, 2008). Considerations were made not only into building the website but also for user feedback, perceptions, and understanding. Methods such as the Concurrent Think Aloud (CTA) allow for real-time feedback while users work through issues (Bergstrom, 2013).

**Project Design and Development**

The website was created using Wordpress, a free online blog system and hosting service. Recent iterations of Wordpress allow for mobile versions making this an optimal choice of platform for the different types of users ("Mobile Themes," n.d.). This would allow anyone with a mobile device to view the website while troubleshooting their equipment. Also, users viewing the site with different monitor screen sizes will be able to view it as it was intended, without disrupting the user experience, allowing text and images to resize depending on end-user equipment. It has intuitive administration controls, highly customizable navigational and plugin tools, and many different themes for different users ("The Features You'll Love," 2012). The Big Brother theme, used for this study, is aimed at large organizations and government Wordpress sites ("Big Brother," 2014). Wordpress also includes an exporting function which allows for easy integration into a live website environment. The website can be viewed at: https://videotechnologies.wordpress.com/
Considerations were made to the theme, colors, fonts, organization, and navigation tools for the initial design (Figure 1). A simple blue theme was chosen to provide the backdrop. The blue color theme promoted a neutral, inviting, and trustable atmosphere (Seckler, Opwis, & Tuch, 2015). The theme included a breadcrumb feature to allow users to view the hierarchy as they are navigating the website ("Big Brother," 2014). This also allowed for easy access back to higher level webpages should a user want to navigate or return to them. Readable fonts were chosen that would also be viewable on multiple screen sizes. (See Figure 2 for a summary of design choices).
Prior to the study, informal feedback indicated a need to improve the aesthetics and features of the website. Menu items were reorganized to allow for a more efficient and self-explanatory website browsing experience. This included moving information on do-it-yourself end user testing to top level navigation, a question often asked during technical support phone calls. Items were also re-worded for different visitors to the website across different disciplines. This would aid casual browsers and random navigators viewing the site simple, basic videoconferencing information.

Standard usability procedures were followed for two rounds. Usability testing included navigation, aesthetics, and general ease of use of the website. Participant feedback indicated a need for graphics to replace text. Major revisions were made to both the Home and Test Your Site pages to convert the text-heavy pages to graphics (See Figure 3). While original considerations were made to the text, with additional colors and font variations, feedback suggested methods to break the monotony and avoid cognitive overload of full page texts. Instead, large, colorful informational graphics were used to detail videoconferencing information and end-user testing.

Duplicate menu items were removed due to confusion on their existence. The original intention was to have duplicates for users viewing only portions of the website and to allow most often used destinations more visibility. Instead, it only led to confusion if the destinations were similar or identical to others. Main menu items were reworded to accommodate VC unit information instead of end-user information. Items were stated for what they are and not for what it may be used for. Minor changes in colors were made for the final version (See Figure 4).
Discussion and Conclusion

Early feedback yielded the most about of data, including a need for a combination of graphics and text instead of text-heavy webpages. More aesthetically pleasing graphics and icons were used and proved successful from later feedback. The VC end user testing page included actual icons and graphic examples of how to do a videoconference test instead of text descriptions. The icons show actual on-screen icons, images, and remote control buttons end users would click and see.

Confusion by some as to the existence of duplicate multiple menu items also indicated not needing them for future designs. Should users viewing only portions of the website may need these items, it is assumed that they would be able to find the item where they should expect them, in a properly placed menu listing.

Later feedback included minor changes, but still yielded valuable data such as perceptions of graphic choices. Across the board positive feedback of the large graphics instead of text confirmed their use for future live use. Later feedback also confirmed a need for breadcrumbs and secondary navigation menu as necessary tools for future designs as participants from both rounds used items from these tools to make their choices.

As research indicates, search bar usage can aid navigation, but usage may be lower than expected (Çetin, & Özdemir, 2013). This was evident in this study, as usage was lower than expected, however, future designs should include this feature as an optional search aid.

As Krug states, little time is spent reading pages, instead we scan them (Krug, 2006). While participants did not use the search bar, simplified language and wording allowed participants to scan faster. While web browsing experience may have been a factor between rounds, improved task completion times between confirmed improvements were made.
While individual tastes and personal perceptions affected some of the design choices, the overall design - colors, fonts, and placement - aligned with current research (Seckler, Opwis, & Tuch, 2015). Feedback indicated a modern, clean educational website while providing useful tips and information. The overall blue theme color was highly favored.

While indicating general approval of the graphics over text, there exhibited limitations in image mapping through Wordpress' free version but can be included for future use in a self-hosted or Wordpress' pro version environment. Image mapping would have allowed users to interact with the large graphics, whereby linking specific webpage coordinates to a hyperlinked destination ("HTML map tag," n.d.). More research may need to be done to make image mapping adjustments for responsive web design integration as image mapping would be most useful as graphically enhanced linked menu pages.

Usability testing allowed for feedback on the ease of use and navigation to the VTG website which should remain an enriching source of information for school support staff. As the goal was to provide an appropriate, user-friendly, and organized website, this study helped to identify necessary features to include and steps to take for future live website implementation. Creating a balance between educational, informative, and aesthetically appealing was evident through this study that there are individual differences of taste, however, to provide an easy-to-use and easily navigable website can be done. A breadcrumb navigation, secondary menu, and search bar; simplified wording to accommodate all users; and graphics to replace text will be used, based on findings from this research study, to incorporate for the live VTG website.

References


Seckler, M., Opwis, K., & Tuch, A. N. (2015). Linking objective design factors with subjective aesthetics: An experimental study on how structure and color of websites affect the facets


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Question for the audience:

Do you know what videoconferencing is?
Question for the audience:

Blackboard Collaborate = Videoconference

Video Technology Website Usability

Problem
Video Technology Website

Usability

- Problem
- Purpose
Video Technology Website Usability

- Problem
- Purpose
- Audience
Video Technology Website Usability

Honolulu District

Please contact the principal when making arrangements to use a school's videoconference system.

<table>
<thead>
<tr>
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<th>Phone</th>
<th>VC Call Number</th>
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<tbody>
<tr>
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<td>832-3595</td>
<td>012165</td>
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<tr>
<td>CSA – Kaimuki High</td>
<td>733-8460</td>
<td>012355</td>
</tr>
<tr>
<td>CSA – McKinley</td>
<td>594-0540</td>
<td>012645</td>
</tr>
<tr>
<td>Hawaii Center for the Deaf and Blind</td>
<td>733-4999</td>
<td>012505</td>
</tr>
<tr>
<td>Hawaii Center for the Deaf and Blind office</td>
<td>733-4999</td>
<td>012515</td>
</tr>
<tr>
<td>Hawaii Center for the Deaf and Blind2</td>
<td>733-4999</td>
<td>012510</td>
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- Problem
- Purpose
- Audience
- Goals
## Video Technology Website Usability

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- **Problem**
- **Purpose**
- **Audience**
- **Goals**
- **Design and Development**
  - Website
  - Usability
Video Technology Website Usability

- Problem
- Purpose
- Audience
- Goals
- Design and Development
  - Website
  - Usability
- Conclusion
Problem

- 300 endpoints & 1 Multi-point Control Unit (MCU)/bridge
- Quality maintenance & support

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Problem

- 300 endpoints & 1 Multi-point Control Unit (MCU)/bridge\(^1\)
  - Quality maintenance & support
- Budget Cuts
  - Less personnel
  - Websites to house information and documents – internal & external\(^2\)

The purpose of this usability study was to evaluate the ease of use and organization of the Video Technologies website and its ability to assist public school support staff with providing basic technology support information.
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Website Design Factors

- Wordpress
  - Admin view easy to use
  - Versatile
  - Integrated mobile view
  - Export for future implementation

Website Design Factors

- **Theme**

  - A horizontal navigation bar sits towards the top of the page, below the header as the main menu and navigation tool.
  - A theme incorporating breadcrumbs was chosen. Breadcrumb navigation assist users in navigating the website's hierarchy.
  - Clean, simple fonts are used to provide easy reading.
  - An easy-to-find Search Bar sits at the top of the secondary menu.
  - A secondary navigation menu is used for additional access to often used sub-directory items.
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- **Colors**
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Website Design Factors

- Theme
- Colors
- Font

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Website Design Factors

- Theme
- Colors
- Font
- Content
  - Navigation
    - Hierarchy
    - Menus

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Website Design Factors

- Theme
- Colors
- Font
- Content
  - Navigation
    - Hierarchy
  - Menus
  - Text
  - Graphics

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Usability Design

- Steve Krug’s *Rocket Surgery Made Easy* (2011)

Usability Design

- Steve Krug’s *Rocket Surgery Made Easy* (2011)
- In-person

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Usability Design

Steve Krug’s *Rocket Surgery Made Easy* (2011)

In-person

Pre-test survey
  - Demographics – web browsing experience

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Usability Design

▸ Steve Krug’s *Rocket Surgery Made Easy* (2011)⁴
▸ In-person
▸ Pre-test survey
  ▷ Demographics – web browsing experience
▸ Protocol
  ▷ Concurrent Think Aloud (CTA)⁵
  ▷ Human-Computer Interaction (HCI)⁶
    ▷ *Task completion and times*
    ▷ *Navigational choices – main menu, secondary menu, or breadcrumbs*

Website Development

**BEFORE**

**AFTER**
Website Development

- Early testing – navigation, aesthetics, and general ease of use
  - Menu items reorganized and some removed
  - Secondary menu adjustments
  - Added graphics
Website Development

- Early testing – navigation, aesthetics, and general ease of use
  - Menu items reorganized and some removed
  - Secondary menu adjustments
  - Added graphics

- Later testing – final adjustments
  - Minor aesthetic changes
  - Minor re-wording
Test Your Site

Find information on doing a test of your VC unit. Choose from the options below (if you require further assistance, please contact us):

**Test with an **[Test Site]**

- **Using your VC unit access the Directory/Address Book.** (For specific unit instructions on accessing the Directory/Address Book please see the section on User Information)
- **Select "ABC Test Your Call"** to connect to a Powerpoint presentation. You should be able to hear music and see the Powerpoint. If either are missing, please contact tech support.
- or **Select "ABC Test Site"** to connect to a tech support VC unit.
  - **Use this only when needing tech support assistance. Your site should automatically connect, however, it may not receive audio until tech support opens a mic at the other side. Contact tech support to let them know you are waiting on the other side for a response. You may also use this option when testing multiple inputs (ELMO/document presenters, DVD players, etc.) and their connections for feedback.

**Test with a site you will be doing a point-to-point conference**

- Use the [Site Directory]. Be sure to have the office or school contact information.

**BEFORE**

**AFTER**
Final Website

- Menu reorganization – removal of some items
- Re-wording & simplification
- Graphics
Findings and Conclusion

- Balancing website design, simplicity, trustworthiness, and informational
Findings and Conclusion

▸ Balancing website design, simplicity, trustworthiness, and informational
▸ Graphic limitations

General Info

How do I get started?
Purchasing a videoconferencing unit
Phone Conferencing

General Information

How Do I Get Started?
Purchasing a VC unit
Phone Conferencing
Findings and Conclusion

- Balancing website design, simplicity, trustworthiness, and informational
- Graphic limitations
- Search bar

Thank You

- Classmates
- Advisors: Dr. Peter Leong, Dr. Catherine Fulford, and Dr. Mike Menchaca
- My Critical Friends: Jeanette Villanueva and Kailana Soto
- Extended classmates and friends: Jami Higashi-Lee and Robin Fujioka
- My family
Questions