Collaborate, network, learn, and grow:
Evaluating the usability of a technology resource website for teachers

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Abstract: K-12 educators are expected to have a working knowledge of current technology tools and classroom integration practices through attending professional development opportunities during the school year. By continually honing their teaching practices, educators are better equipped to instruct their students using relevant technology tools. Teachers at a private elementary school on Oahu engage in training experiences provided by their own institution. Administrators wanted to consolidate present methods of facilitating training into one common website for their teachers. As the institution’s technology coordinator, I work directly with faculty members to integrate technology into classroom teaching. This website facilitates my meetings with faculty and provides a digital archive for teaching and training materials. The purpose of this usability study was to assess the organization of the content, navigational efficiency, and user satisfaction of a technology resource website (focusing on Web 2.0 tools for cloud computing, professional learning networks, and blended/flipped classrooms) for elementary teachers at a local private school on Oahu. Peer feedback led to simplifying the content volume of each web page, clearly labeling page titles, and adding buttons to assist in navigation throughout the website. This paper will examine the design changes implemented, compare the resource website before and after modification, and discuss the theoretical frameworks and instructional design models that informed design choices.

Introduction

Educators must continually hone their methods to provide an optimal learning environment for students. Both public and private institutions are adopting standards to measure teacher performance, specifically with technology integration. The ISTE Teacher Standards (2008), for example, call for educators to develop digital student learning experiences and model citizenship with technology. Educational frameworks such as the technological pedagogical content knowledge (TPACK) provide teachers with a focus to understand the relationship between technology integration and instructional practice (Baran, Chuang & Thompson, 2011).

Such professional development practices were a high priority for a local private school on Oahu. The school wanted to consolidate methods of facilitating technology training into one common website. The existing methods of providing technology resources included,
but were not limited to the following: e-mails, faculty bulletin write-ups, hardcopy handouts, Google Drive folders, verbal announcements, and training sessions. A single resource website simplified teacher access to technology training and materials.

As the institution’s technology coordinator, I work directly with faculty members to integrate technology into classroom teaching practices. The resource website developed for this project was designed to facilitate my weekly meetings with teachers and provide a place to house the institution’s digital teaching and training materials. Thus, the purpose of this usability study was to assess the organization of the content, navigational efficiency, and user satisfaction of a technology resource website (focusing on Web 2.0 tools for cloud computing, professional learning networks, and blended/flipped classrooms) for elementary teachers at a local private school on Oahu.

**Literature Review**

**Visual Design Principles**

When designing web-based learning environments, visual design and aesthetics are important to consider in the overall user experience (Glore & David, 2012). This is particularly crucial for educational institutions, as attention to aesthetics can improve the frequency that users interact with and learn from the online environment. Since web-based instruction is becoming more prevalent, visual design concepts are being considered alongside instructional design and e-learning platform choices (Glore & David, 2012).

In *Multimedia Learning* (2009), Richard Mayer presented twelve principles of multimedia learning, along with the theory and practicality behind each. He defined multimedia learning as “learning from words and pictures, as compared to multimedia instruction being about the presentation of words and pictures to promote learning” (Mayer, 2009, p. 6). These principles were directly applicable to web portal design. The Coherence Principle, for example, suggests that more learning occurs when extraneous information is eliminated from the multimedia product (Mayer, 2009, p. 82). Similarly, Swanson & Green (2011) stated that when more items are added to a website the focus becomes less obvious (p. 227). Successful web environments, then, balance appropriate multimedia with a clear purpose for users.

**TPACK Framework**

Our present digital society requires students be equipped to navigate and evaluate an ever-changing network of information. Teachers are applying these skills to their own professional learning, particularly with integrating technology into their practices (Baran, Chuang & Thompson, 2011) (ISTE, 2008). Frameworks such as technological pedagogical content knowledge (TPACK) provide educators with models for knowing when, where, and how to guide student learning with technology (Niess, 2011). Many teacher education programs are currently redesigning their curricula to foster this need to integrate technology, content, and pedagogy (Niess, 2011). School districts and
administrators are following the lead of such programs by addressing the individual technology training needs of faculty members.

To support this culture of differentiated professional development, many institutions are optimizing tools such as web portals and resource websites to disseminate information to faculty (Basa & Bringula, 2011). According to Chien, Kao, Yeh, & Lin (2012), teachers have expressed positive feelings towards web-based professional development due to the perceived social stimulation associated with using an interactive web portal. The current nature of professional development has moved from isolated conferences and towards “just-in-time” methods that are readily accessible via technology portals. Naturally, the Internet has become an indispensable resource for tutorials, videos, webcasts, online modules, electronic forums, and teleconferencing to improve educational practices (Hamel, Allaire & Turcotte, 2012) (Trust, 2012).

Since the Internet has revolutionized the speed at which professional development resources can be accessed, educators are more eagerly exploring technology initiatives to implement in their classrooms. As Denton (2012) noted, cloud-computing initiatives such as Google Apps for Education have become popular among K-12 institutions. Approaches such as blended learning and flipped classrooms have shifted teacher-student interactions from traditionally face-to-face to a variety of hybrid approaches using online learning environments (Gerbic, 2011). Finally, highly effective educators extend their knowledge acquisition and information analysis through developing online professional learning networks to collaborate with others (Trust, 2012).

**Usability Studies**

User satisfaction with a product is the ultimate goal in software and website development, which often becomes lost in the engineering process. As Steve Krug notes in *Rocket Surgery Made Easy* (2010), informal usability testing refers to “watching people try to use what you’re creating/designing/building…with the intention of (a) making it easier for people to use or (b) proving that it is easy to use” (p. 18). A usability study by Swanson & Green (2011) on the homepage of a college library website illustrated the importance of involving users in the redesign process. In this case the usability study resulted in a null hypothesis and surprising results that would have otherwise been overlooked by the librarians in the design process (Swanson & Green, 2011). While librarians anticipated user preference toward a “Googlized” search feature on their website, users actually found the current design to be the most effective (Swanson & Green, 2011).

Usability testing allows for multiple revisions and iterations to the product until the desired result is achieved. While usability testing practices can take on a variety of forms, all variations involve observing people using the product (Krug, 2010). Evaluators utilize think-aloud strategies, both formal and relaxed, to gain qualitative insights during testing (McDonald, Edwards, & Zhao, 2012). The basic types of think-alouds include concurrent, where participants verbalize their thoughts while completing tasks, and retrospective, where participants reflect on their experiences after all tasks are complete.
(McDonald, Edwards, & Zhao, 2012). Both types of think-aloud strategies provide qualitative data about participant experiences.

**Project Design and Development**

**Background**

The institution where I am the technology coordinator had a public website that was integrated with a private learning management system (LMS). The technology resource website was integrated into the faculty portion of the LMS. The existing technology resource website was unable to be modified for this usability study; therefore, a beta website was created to mirror the functionality and organization of the original website.

**Website Design**

The beta website was developed using Wix, a free, online website creator. Wix was chosen over other similar platforms based on researcher familiarity, as well as the functional similarities to the existing technology resource website. Additionally, Wix provided a free hosting platform and a variety of add-ons and embedded tools. The beta website was located at [http://rek298.wix.com/elemtechresources](http://rek298.wix.com/elemtechresources).

The institution’s LMS had structural limitations, so all of the content pages were located in resource folders and on the homepage. The beta technology resource website contained all of the same sections as the institution’s original website. As shown in Figure 1, the informative homepage provided updates to recent information and links to school social media accounts. The homepage included important links to the school YouTube channel, the public website, and the school calendar. Recent YouTube videos from the school channel populated below the important links, as did an RSS feed to national news coverage. The quarterly school bulletin was displayed on the right side of the home page, as it was an important source of news dissemination.

A navigational menu bar was visible at the top of all pages and sub sections of the website. To navigate to a sub-section of the website, users clicked directly on the name of the section that they wished to visit. There were no drop-down links in the menu bar. As shown in Figure 2, the menu bar linked to sections for the calendar, content, bulletins, and a blog.

The Calendar section of the website displayed a Google Calendar with important all-school and elementary campus events. This same calendar was linked on the homepage of the website. Figure 3 shows the details of the calendar page.

The Resources section of the website housed the major content pages of the website. The Technology Resources section was found within this section of the website. Users could click directly on the circular icons to navigate to further links within each resource section. Figure 4 illustrates the resource pages of the website.
Figure 1. Homepage of the beta website.

Figure 2. Website navigational menu bar.
To access the Technology Resource page, users could click directly on the circular green smartphone link (see Figure 4). Once at the webpage, there were further links to the technology content sections that were used for faculty professional development at the institution. As seen in Figure 5, these content sections included cloud computing, professional learning networks, and blended/flipped classroom learning.
Within each of these major sections, there were sub-sections about general information, Web 2.0 tools, school usage, and videos and media about the topic. Figure 6 shows a sample of these further links within the Professional Learning Networks section.

Each icon linked to a viewable Google Document containing the content. The content included on the website was collected from existing presentations and documents, organized logically to fit the categories, and supplemented with visuals and multimedia. Figure 7 shows an example of this content within the Information page of the Professional Learning Networks section.

The website theme was simple to mirror the aesthetics and functionality of the institution’s LMS. Page backgrounds were lightly patterned, adding to the overall feel of the website without taking away from the content. All images and icons within the sections and sub-sections were from the Wix gallery, while other graphics used on the content pages were found through image searches with pictures labeled for reuse.
Figure 7. Sample content page on information for Professional Learning Networks.

**Modifications**

Several modifications were made to the website following peer feedback. First, a back button link was added to all of the sections and sub-sections of the website. Figure 8 illustrates its placement at the top of the page. By clicking on the underlined, bolded link, users were taken back to the previous page in the website.

Figure 8. Back button link on Technology Resource page.

The content pages were also re-organized and streamlined based on peer feedback. After removing unnecessary links, the remaining ones were moved into tables with clear, bolded titles. Figure 9 shows the new version of Figure 7 after the suggested changes.
The sub-section titles within the Technology Resource page were also clarified, based on suggestions from peer feedback. Figure 10 shows the updated Professional Learning Networks sub-section titles within the Technology Resource page, which were present in the Cloud Computing and Blended/Flipped Classrooms sub-sections as well.

Figure 10. Updated sub-section titles in the Professional Learning Networks sub-section.

The final revision to the website was changing the YouTube icon on the homepage of the website from a yellow school bus to a microphone. Figure 11 illustrates this change.
Conclusion

Next Steps

Usability is an iterative process with the ultimate goal of user satisfaction. Therefore, the next steps in this project include gathering data from the target audience. Any reasonable peer feedback suggestions gained from the usability testing will be considered for future website modifications. A “frequently asked questions” section will be added to clarify technology definitions used in the content pages. Finally, a content reorganization of the entire website will be incorporated with stronger search features. Separate sections for videos and apps will also be included, per peer feedback suggestions.

Lessons Learned

After experiencing the usability process as a researcher, several lessons have become apparent. First, usability is about meeting the needs of the target audience. As such, testing instruments must be designed to maximize participant feedback. Next, small changes to the website have the potential to make a huge difference for users. An example of this was the changing of the YouTube Channel icon from a bus to a microphone. Finally, the process of usability is humbling to experience as a designer. Changes to products occur rapidly, sometimes undoing work that took many hours to complete. Keeping user satisfaction as the focus makes these changes more bearable.

Overall, usability testing is an effective way to evaluate a website for its target population because of the focus on user experience. Data gained from testing can be quickly translated into improvements, with the cycle continuing until an optimal user experience is achieved. As a technology coordinator who is in charge of professional development, this website will simplify my regular communication with teachers regarding technology tools. By creating a satisfactory product, my institution will be more confident in their educators to access information and, ultimately, integrate technology into their teaching.
References


