Abstract: Teachers are pressured more than ever to incorporate technology into learning environments due to societal expectations and the implementation of Common Core State Standards (CCSS) as the leading guide for standards-based curriculum design. Thus, it is crucial for teachers to receive timely training and helpful resources for the successful integration of technology into one’s teaching practices. This online instructional module was developed to share information about four Web 2.0 tools and their application towards fulfilling technology-driven English language arts CCSS. Therefore, the purpose of this instructional design project was to evaluate the effectiveness of the website’s design and content and to compare attitudes of teachers towards using these online tools before and after they viewed the module. Of the twelve original participants, eight were able to complete the module within the time allotted. Basic descriptive statistics were used to analyze pre and post survey results from varying Likert-scales and patterns were identified in open-ended responses in the post-survey. Findings illustrated that most participants’ familiarity, confidence, and likelihood of using the tools as part of their teaching improved after completing the learning module. The findings also resulted in recommendations for how the module could be improved for future use by teachers.

Introduction

Educators are pressured more than ever to stay up-to-date with the ever-changing advancements of technology in order to meet the needs of 21st century learners. They are pressured to challenge students to think beyond the classroom and apply their knowledge and skills to the real world. Consequently, online environments with access to thousands of Web-based tools have become popular forums for such an exchange of knowledge and skills to occur.

Interactive web-based tools popularized as “Web 2.0” by O’Reilly in 2004, have molded the World-Wide Web into a platform where users have the capability to “harness collective intelligence” as co-developers of content (O’Reilly, 2005). Users of Web 2.0 interact online by sharing, collaborating, editing and publishing information in real time through social forums such as blogs, wikis, social networking sites, and document sharing or video sharing sites. By incorporating the use of such tools in a learning
environment, not only can teachers make learning fun and interactive, but these tools can enhance the relevance of content while strengthening the skills of students who are already active users of Web-based technology.

Students, of all ages, are interacting with technology at an increasing rate for personal, social, and educational purposes; therefore, students today have learner characteristics, different than previous generations, that must be considered by educators to maintain the interest of such learners (Prensky, 2001; Skiba & Barton, 2006). Technology, especially Web 2.0, can greatly benefit a student’s learning potential by enriching educational content and supporting student participation throughout the learning process (Prensky, 2005; Berk, 2010). Web 2.0 tools have the potential to transform education by changing the approach of teaching from a teacher-centered to a student-centered environment (Hargadon, 2009); which is promoted by the U.S. Department of Education as a necessary step to meeting the needs of current learners (U.S. Department of Education, Office of Educational Technology, 2010).

**Background**

Recognizing the impact technology has on learners, the US Department of Education and teachers themselves show interest in learning about web-based tools, yet there remains a lack of experience and confidence by administrators and teachers to successfully implement these tools into educational environments (U.S. Department of Education, Office of Educational Technology, 2010). In addition, with the adoption of Common Core State Standards (CCSS) nationwide, teachers are pressured more than ever to update their teaching practices to address the standards that specifically call for the use of technology (National Governors Association Center for Best Practices & Council of Chief State School Officers, 2010).

According to a 2009 study conducted by the United States Department of Education’s National Center for Education Statistics, reported use of Web-based tools were the lowest form of educational technology used by both teachers and students for classroom activities and instruction. The majority of teachers reported spending only 1-8 hours in professional development activities for educational technology in a 12-month span of time (Gray, Thomas, & Lewis, 2010). Additionally, the 2009 study reported findings that teachers’ independent learning was the highest factor in preparing them to make effective use of educational technology for instruction compared to professional development or other staff trainings (Gray, Thomas, & Lewis, 2010).

Therefore, teachers need training opportunities that are both individually and professionally conducted for successful integration and acceptance of technology into one’s practices. Ertmer (2005) suggests that one must consider the pedagogical beliefs of teachers and the impact this has on their ability and interest in incorporating technology into their practices. Teachers need the opportunity to increase their familiarity with new technology and to see the relevance of it in order to improve their beliefs about using it as part of their teaching practices. Furthermore, Ertmer (2005) states, “introduce teachers to the types of technology uses that can support their most immediate needs to increase
confidence and change beliefs;” teachers need time to personally experience the technology, view relevant examples of others using the technology, and receive support and encouragement from their professional community.

For that reason, the purpose of this instructional design project was to have secondary teachers evaluate the content and design of an online learning module created as an introduction to four Web 2.0 tools to be used in educational settings. This project was conducted with the intent to provide teachers with access to an informational, resource-based website that could serve as a training module for technology integration. Additionally, instructional materials and sample lesson plans in the module addressed specific English language arts Common Core State Standards (ELA CCSS) to not only emphasize the educational uses of Web 2.0 tools but also to encourage writing across all content areas.

Methodology

Instructional Strategies

The ARCS model was used as a guide to design this online module in order to effectively address the goals of this project. The ARCS model has four key components- Attention, Relevance, Confidence, and Satisfaction- that are used to design instructional materials and motivate students throughout the learning process, (Huang, Diefes-Dux, Imbrie, Daku, & Kallimani, 2004; Keller, 2011). In this module, to gain the attention of participants and ensure the relevance of the content, user-friendly language, multi-media, and simple activities were provided to explain the uses of the four Web 2.0 tools. The clear and consistent format of each page of the online module- including objectives, steps to sign up for each online tool, navigational information, engaging and meaningful activities with examples, and additional resources- were all provided to improve the confidence and satisfaction of participants towards Web 2.0 and the module itself.

Participants

Participants were recruited through sending personal emails to teachers the researcher knew; a copy of the IRB sample email and consent forms are in Appendix A. Out of the twelve originally recruited participants, eight were able to complete the learning module within the allotted time. The participants consisted of five male and three female high school teachers who ranged from three to over twenty-five years of teaching experience in high schools throughout Hawaii. Five participants had Master’s degrees and three had Bachelor’s degrees. The teachers taught across four content areas (English, mathematics, science, and social studies) and differed in experience with technology integration related to teaching practices. While the module was designed using English language arts examples tied to the ELA CCSS, the tools could be used in other subject matter areas where writing and presentation skills are assessed.

Instrumentation
All content related to this project was presented through a website created using Weebly, a free website-hosting service. Individual pages were created within the site to present information on four designated Web 2.0 tools, in the form of textual and visual guides, to assist the participants as they navigated through the content. The four tools that were presented were VoiceThread (VT), Google Forms (GForms), Prezi, and Weebly. These tools were chosen because of their free, basic accounts and because they were easy to learn and use for instructional practices. If participants really liked a tool, they had the option to upgrade to an educator account for future use. Pre and post surveys were created using GForms and embedded on designated pages within the Weebly site. All video tutorials in the module were made by using ScreenR, a web-based screen recorder, and were directly related to the activity provided for each tool.

Once teachers gave consent to participate, they were asked to visit the homepage of the website, http://webtoolsforsecondaryteachers.weebly.com/, where they were provided information on the purpose of the project and how to navigate through the site. Participants were prompted to complete the embedded pre-survey on the homepage to identify their level of experience and attitude in regards to Web 2.0 tools, see Appendix B for pre-survey questions. The website consisted of the following sections: 1- homepage with purpose of project, instructions on how to navigate the module, and pre-survey; 2- Introduction to Web 2.0; 3- explanation of ELA CCSS emphasis; 4- VT; 5- GForms; 6- Prezi; 7- Weebly; 8- post-survey; 9- contact information. Figure 1 is a screenshot of the homepage of the module site displaying the purpose of project, table of contents, and sections of the module in the navigational toolbar.
After completing the pre-survey, participants were encouraged to review the module in the order presented from left to right on the navigation bar of the website. They were instructed that they could complete the module at their own pace by finishing it in one sitting or revisiting the module over the course of two weeks. As participants navigated throughout the module, on the main page of each Web 2.0 tool, they were provided with a brief overview, steps to sign up for an account, a video tutorial, an introductory activity using each tool, and subpages with a basic lesson plan and instructional materials pertaining to a designated technology-driven ELA CCSS. Once the learning module was completed, participants were asked to take a post survey (see Appendix B) to report their attitude about the Web 2.0 tools that were presented and assess the effectiveness of the content and design of the learning module.

Data Collection

Both quantitative and qualitative data were collected using pre and post surveys to determine the effectiveness of the learning module and to measure participants’ attitude towards Web 2.0 integration. To ensure anonymity and check for completion of the learning module, participants were asked to create a code name that they input on each survey. Likert-scale questions were analyzed using basic descriptive statistics, and open-ended responses were qualitatively analyzed by identifying overall themes.

The pre-survey was conducted to gather demographic information and to measure the confidence, interest, and likelihood of using the four specified Web 2.0 tools prior to completing the learning module; it consisted of 19 questions. The pre-survey can be seen in Appendix B.

The post-survey was administered to evaluate the effectiveness of the website’s design and content and to compare attitudes of teachers towards using these online tools after they viewed the module; it consisted of 35 questions. Participants provided open-ended responses in the suggestions and further comments sections at the end of the survey. The post-survey can be seen in Appendix B.

Only nine of the original twelve participants attempted to complete the learning module within the time allotted. Three consenting participants did not attempt to complete any portion of the learning module nor communicate any reason for not participating. One participant answered the pre-survey questions twice, on two different dates; therefore, the first response was used for the purposes of this study. Lastly, another participant only answered the post-survey questions and was not included in the data analysis.

Results

Pre-survey

Responses to both the pre and post-surveys were gathered from a total of eight participants. In the pre-survey, seven of the eight participants said they were at least “somewhat familiar” with Web 2.0 tools, all participants indicated they had some form of
a Web 2.0 account, and six of the eight noted that they used it for personal and social reasons. Participants also noted their use of the four tools presented in the module in the pre-survey. All but one participant used three of the four tools on a daily to weekly basis, while most participants rarely to never used each tool. VT and Prezi were identified as the least used or applicable tool, while GForms was indicated to be the most used (see Table C1 in Appendix C).

The pre-survey responses indicated that all participants believed that Web 2.0 tools would benefit students if integrated into instruction, yet six of the eight participants lacked confidence in using Web 2.0 tools as part of their teaching practices. However, all participants responded with interest in using Web 2.0 tools if provided instructional materials (see Table C2 in Appendix C).

Although all reported they would be more likely to use Web 2.0 tools if provided instructional materials, half were “undecided” about the likelihood of using VT, seven were “undecided” or only “somewhat likely” to use Prezi, and six were “undecided” or “somewhat likely” to use Weebly in their teaching practices. The most likely tool to be used was GForms with half the respondents indicating they would “very likely” use this tool for teaching (see Table C3 in Appendix C).

**Post-survey**

The post-survey indicated that all eight participants felt more familiar with and were interested in learning more about Web 2.0 tools in general as a result of gaining useful information from the modules. Seven of eight “agreed” to feeling more confident in using Web 2.0 tools in teaching, planned on integrating them in instruction, and felt students would benefit from using Web 2.0 in teaching practices. One participant reported that they did not plan to integrate Web 2.0 tools in their teaching (see Table C4 in Appendix C).

All reported the information in the module, for each Web 2.0 tool, was “mostly or very useful,” with the exception of one participant who was undecided about the information on VT. At least six of eight reported feeling “mostly or very confident” in using the specified Web 2.0 tools in instruction after completing the module (see Table C5 in Appendix C). The majority of participants indicated they would be “somewhat or very likely” to implement the tools in their instruction, and the tool most likely to be implemented appeared to be Weebly (see Table C6 in Appendix C).

Pertaining to the design of the module, all participants “agreed” that the information presented was clear and organized logically. At least six of the eight participants reported that they “agree” that the module was manageable in length and contained helpful multimedia and links to other sources, the remaining felt “neutral” about these areas of the design of the module. See Table C7 in Appendix C to view the post-survey evaluation of the module design.
All reported that the content in the modules, especially the lesson examples, were applicable and helpful to their instructional practice. While seven participants “agreed or strongly agreed” that the activities and connections to ELA CCSS were helpful and clear; although, one participant reported “neutral” for these three areas of the content. All participants “agreed or strongly agreed” that they would recommend the site to others (see Table C8 in Appendix C).

Lastly, participants expressed positive feedback, in the “further comments” section of the post-survey, about their experience going through the module. Some text comments were: “An excellent source of information that will certainly help me in my endeavor to be the most effective teacher I can be for my students,” “Very easy to understand and extremely informative,” and “I think this is inspirational and is something we could all use.”

Discussion

When comparing pre and post-survey mean scores, it is clear that participants had a positive and motivating experience from the online module. In the pre-survey, all participants reported that they were familiar with Web 2.0 mainly for social and personal uses but lacked confidence using the tools (see Table C1 in Appendix C). After completing the module, findings indicated participants’ confidence, interest, and plans to integrate Web 2.0 as part of their teaching practices had increased, see Figure 2.

![Figure 2](image)

**Figure 2.** Pre and post-survey comparison of participant attitude towards Web 2.0

Although all participants found the information, lesson examples, and instructional strategies useful and applicable, one or two remained undecided about their confidence and the likelihood of implementing these tools into their teaching practices (see Tables C6-C8 in Appendix C). These few undecided may have also reflected text comments that
indicated some reluctance towards the purpose of the module. For example, a few participants expressed that the lesson examples could have been “related to actual student/teacher assignments,” they had a “hard time getting through the content,” and links to additional resources would have been helpful.” These suggestions imply that there was some confusion with the intentions of parts of the module, where links and sample lessons were actually provided to meet those exact needs; thus, these sections of the module could be revised.

Conclusion

There are many factors that need to be considered when devising professional development in order to make a real impact on teachers’ beliefs and instructional practices regarding technology. Teachers need training opportunities that are both individually and professionally conducted, ample time to review and practice using the technology to build confidence, and the option to voluntarily participate in order for real change to occur (Schrum, 1999). All of these factors, including the ARCS model, were considered for this project to be a success. For the most part, it seems as though this project was a step in the right direction. Findings show that participants appreciated training that they could complete individually through guided, online modules. This allowed the teacher participants, who had limited time already, to work at their own pace and complete activities to their liking. Therefore, they may have started off the experience with a positive and open-mind to the material they were about to process. Subsequently, the pairing of Web 2.0 with technology integration and ELA CCSS was received positively. However, after reviewing the module, further action should be taken in regards to strengthening the CCSS goal of the project by creating more lesson examples to make such connections.

Ultimately, an educator’s goal is to prepare students to be successful outside of school. Web 2.0 tools are helpful applications that can assist teachers and students along this journey towards success. The participants in this project recognized the benefit of Web 2.0 tools in creating dynamic and engaging learning environments to meet the technology needs of 21st century learners. These tools will not only benefit students in class but also in business settings throughout society; therefore, educational settings should assist students with acquisition of Web 2.0 by providing learning opportunities that will prepare students for when they enter the workforce, (Sendall, Ceccucci, & Peslak, 2008). Web 2.0 technologies have the ability to foster global communication and collaboration as well as provide powerful insight into the content and context of learning, (Asselin & Moayeri, 2011; Grosseck, 2009). In order for technology to be successfully implemented by teachers in educational environments, it is imperative that teachers are provided with training and access to helpful resources in an organized and simple format; otherwise, many teachers may be reluctant to incorporate these tools into their teaching practices.
References


