Using Skype for Building Effective Group Collaboration for Microsoft Windows Users

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Abstract: As students’ complete high school and move onto post secondary education they find that many college instructors utilize collaborative course work to facilitate learning. To be successful with this type of course work it is important for students to be familiar with collaborative software applications such as Skype which provide an alternative form of collaboration when face to face interaction is not available. The purpose of this instructional design project was to develop and evaluate a web-based instructional module for students at the University of Hawaii at Manoa which illustrated how to incorporate the tools and software applications of Skype to create an effective group collaboration forum. In this project a web-based instructional module was constructed and administered in a five-step process which included a module pretest, instructional modules, instructional videos, a module post test, and a post module questionnaire. Eighteen master students enrolled at the University of Hawaii at Manoa participated in this instructional design project. Comparative analysis of the instructional module tests found that the module was an effective learning tool. Post module feedback confirmed that the multimodal design approach was well received by learners and contributed to a high satisfaction rating of the module as a learning tool.

Introduction

As students complete high school and move onto a post secondary school environment they realize they must now adjust not only to college life but also to a new style of teaching and learning. Students find that many college instructors utilize collaborative course work in addition to their traditional classroom lectures to help facilitate student learning. To be successful with this type of course work it is important for students to be familiar with collaborative software applications such as Skype which provide an alternative form of collaboration when face to face interaction is not available. Skype is an “online voice over Internet protocol (IP) tool that can be downloaded to a computer …[and] functions as a chat tool, telephone, and videoconferencing tool all at once” (Champ-Blackwell and Hartman, 2008, p. 276). The purpose of this instructional design project was to develop and evaluate a web-based instructional module for students at the
University of Hawaii at Manoa which illustrated how to incorporate the capabilities of Skype to create an effective online group collaboration forum using a Microsoft Windows operating system.

**Literature Review**

Collaboration can be defined as “a structured, recursive process where two or more people work together toward a common goal” (Vallance, Towndrow, & Wiz, 2009, p. 20). When analyzing the success of an online learning environment, student-to-teacher and peer-to-peer collaboration are essential. Research suggests that a student’s performance during problem-solving group projects can be positively affected by participating in online collaborative learning environments (Hungwei, Heng-Yu, Chien-Hsin, & Ling, 2009).

As the “Millennials” generation of students move into college it is essential for teachers to strive to develop new instructional techniques which inspire these technically savvy learners. The incorporation of technology during the instructional design process can help bring a familiarity to the instructional material and encourage learning. Research has found that the more media channels included in a learning module the greater learner satisfaction (Pomales-Garcia and Liu, 2006). For this reason, a multimodal design approach would be most effective when designing a module of instruction for today’s learners.

In addition to a technological appeal, one successful approach to the instructional design process is the ADDIE model. “The ADDIE model or some derivative of it provides designers with the necessary structure for designing any curriculum, regardless of the instructional methods employed” (Hodell, 2006, p. 12). Analysis, design, development, implementation, and evaluation mark the five elements of the ADDIE model which are applied during the instructional design process (Hodell, 2006). In addition to formal instructional design, modules can also benefit from integrating student motivational factors such as the ARCS model. “The ARCS model is ‘a system for improving the motivational appeal of instructional materials, of instructor behavior, and of the way in which lessons (or modules) and courses are designed’” (Cheng and Yeh, 2009, p. 600). Designing a learning module to meet the four conditions of the ARCS model to include attention, relevance, confidence, and satisfaction provides a greater chance of allowing learners to become and remain motivated about the learning material.

**Methods**

The intended target audience for this instructional module was freshman students attending the University of Hawaii at Manoa. However, due to the limitations associated with accessing participants from the target population, the final module implementation was conducted using master students enrolled at the College of Education, University of Hawaii at Manoa. These participants frequently used Skype for collaborative purposes in their area of study and evaluated the module design and effectiveness as subject matter experts.
Module Design
This instructional design project’s web-based instructional module was developed using the website: http://skypelearningmodule.weebly.com/. Module delivery was constructed as a five-step process. Step one consisted of a module pretest which established a knowledge baseline for each learner. Step two enabled the learner to review the instructional material by using either a PowerPoint slide presentation or by downloading a PDF version of each learning module. Step three allowed the learner to continue to review the instructional material by watching instructional videos. Three instructional videos were created using the software Jing and the website Screencast.com. Created by TechSmith Corporation, Jing is a computer software application which enables users to take a screenshot or video of their computer monitor and then share the images/video via the web using Screencast.com or some other form of electronic communication software. The instructional material reviewed in each of the learning videos reinforced the same information outlined in the three PowerPoint presentations as a way to appeal to learners’ multiple learning styles. Step four consisted of a module post test and step five involved an optional post module questionnaire.

Module Content
A web-based instructional module consisting of three learning modules was developed for this project. The Skype module content was designed to be informative for both the most novice to the well experienced Skype user. Module one was geared towards the first time Skype user. This learning module outlined how to set up a new Skype account and explained how to download and install Skype, how to create a Skype account, how to create a Skype profile, and how to build a Skype contact list. Module two was designed to provide the learner with the basic functionality of Skype and explain how to connect with Skype contacts. This module explained how to identify a contact’s online status, how to make a person to person or video call, how to add additional contacts to a call in progress, and how to create a conference call. Module three highlighted the Skype collaborative features. This module explained to the learner how to use Skype file sharing, screen sharing, instant messaging, and emoticons. It also explained how to access third party applications which offer additional collaboration tools for use in Skype to facilitate effective group collaboration.

To assess module effectiveness and collect learner’s feedback, a module pretest, post test, and post module questionnaire were incorporated. Participation in this project was on a voluntary basis and completely anonymous. To allow for comparative analysis participants were asked to select a random code which they entered when completing both the module tests and the post module questionnaire. The data collected from the module pretest and post test was used to assess the overall module effectiveness. Responses provided in the post module questionnaire gave qualitative feedback on the module content and design to include possible areas for module improvement.

Module Testing
Prior to module implementation, a Skype learning module prototype was distributed to a test group comprised of one faculty member and two graduate students from the Department of Educational Technology at the University of Hawaii at Manoa. Prototype
content and design feedback was received from the faculty member and one graduate student. The test group module feedback included a recommendation to provide additional website navigational directions to help learners navigate back to the module once they had completed the module tests and post module survey. Based on this feedback directional messages and website links were added at the end of each module test and the post module survey. In addition, a “continue” button was added to the main pages of step one, step four, and step five to further aid learners with navigating through the entire module. Another feedback recommendation focused on step two of the module addressing how the instructional material was presented. In the module prototype the module’s instructional materials were only available via Microsoft PowerPoint slides presented in the PowerPoint slide editable view. As a result of this feedback all PowerPoint instructional module slides were saved in the slide-show-mode, and a PDF version of each module was added as an additional review option. Other test group feedback recommendations included the addition of a review question slide for each module to help reinforce the learning material, the consolidation of some text items to help reduce PowerPoint slide content, and other minor grammatical corrections. All module recommendations were put into practice or corrected prior to final module implementation.

Module Implementation
Participation in this instructional design project was completely voluntary. To solicit participants an email invitation was sent to a consolidated list of students currently enrolled in the Educational Technology Department at the University of Hawaii at Manoa Masters Program. The email contained a “Consent to Participate Form” which outlined the project purpose, description, and website location. Individuals who agreed to participate could select the hyperlink enclosed in the form and go directly to the module website. Once at the learning module website, learners were required to read the “Consent to Participate Form” again and select the “continue link” to enter the online learning module. A total of 18 people reviewed the instructional module and completed at least one portion of the Skype module tests or post module questionnaire.

Results
Of the eighteen participants who reviewed the instructional module and completed at least one portion of the module tests or post module questionnaire, only sixteen participants completed both the module pretest and module post test, and only twelve participants opted to provide module feedback using the post module questionnaire. Based on these results, quantitative comparative analysis was conducted using participant test scores for a sample population of sixteen complete observations. One complete observation was equal to one participant submitting a completed module pretest and completed module post test. In addition, quantitative analysis for a sample population of twelve observations was conducted using participants’ responses to the post module questionnaire Likert scale questions. Qualitative thematic analysis was conducted using post module questionnaire feedback for the optional open-ended questions.
Module Quantitative Analysis
Module effectiveness was assessed using quantitative comparative data methods. The first approach compared the improvement of participants test scores with respect to module specific test questions. The second approach was based on participant’s overall test score comparisons. In addition, module satisfaction ratings and perceptions of the module as an effective learning tool were analyzed using participant responses to the Likert scale questions in the post module survey.

Table 1 illustrates the number of participants who answered a test question correctly in the module pretest compared to the number of participants who answered the same question correctly in the module post test. Results show that the number of participants to answer a test questions correctly either remained the same or increased for twelve of the fourteen test questions or 86% of the test questions.

Table 1. Participant Results by Question

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The number of participants who correctly answered questions 11 and 13 in the module pretest decreased when compared to the module post test. These results were not expected and may be a product of participant fatigue as they reached the end of the instructional module, or possibly a result of confusing or misleading wording used in the development of the test questions or answer options.

Table 2 outlines the participant test scores for both the module pre and post tests. Results show that 10 out of the 16 participants, or 63% of the participants, increased their test scores when comparing the module pretest to the module post test. The remaining six participants recorded the same score for the module pretest and module post test, meaning 100% of the module participants scored the same or better on their module post test when compared to their module pretest.
Table 2. Participant Results by Overall Test Scores

Participants were asked in the post module survey “How satisfied are you with this website as a learning tool?” Table 3 illustrates that 100% of the participants were satisfied with the web-based module as a learning tool with 58% percent of the participants being very satisfied and 42% being somewhat satisfied. Table 4 outlines participants’ responses when asked, “The learning module helped me to learn about Skype and understand the collaborative tools available on Skype.” All twelve participants surveyed agreed the learning module helped them to learn about Skype and understand the collaborative tools with 33% strongly agreeing and 67% agreeing with the question.

Table 3. Participant Satisfaction Rating

Table 4. Participant Learning Estimation

Module Qualitative Analysis
Thematic analysis was used when reviewing the qualitative data collected from the post module open-ended survey questions. Common themes were found in participants’
perceptions of the module’s multimodal design, delivery effectiveness, and areas for future improvement.

Post module survey feedback on the module’s design provided a premise that participants were partial to the module’s multimodal design. When asked what participants enjoyed most about the learning module the following statements highlighted the appeal of the multimodal design:

- I enjoyed how it broke down into three different modules, had PDF file formats as well as videos-- different inputs.
- The PDFs were an added feature. I especially liked the review videos at the end.
- There were many ways to view the content and review it.

Simple effective delivery proved to be another theme provided in participants’ responses to what they enjoyed most about the module. The following feedback was provided:

- It was easy to navigate and complete as well!
- I enjoyed how easy it was to navigate through your module. Instructions were clear and it guided me through each step.
- Simple yet effective.
- The content presented was clear and concise.

An adjustment to the module’s length was a common idea when participants were asked for additional module suggestions and input on how the module could be improved for future use. Participants’ comments included:

- It was a bit long. Might give a heads-up to how much time it will take.
- Suggest the videos come first and then give the option to download or view the PowerPoint if they need more reading or reference.
- Very long, let people know what they are getting into.

**Implications or Discussion**

The constant development of new technology has created a continuous race for instructional designers to bridge the learning gap between technology and the user. Pamales-Garcia and Liu (2006) found that the more media channels included in a learning module the greater learner satisfaction. Using a multimodal design approach for the Skype web-based learning module proved to be well accepted by module participants. This research illustrated the need for instructional designers to consider a multimodal design approach in the designing of future projects to bring a familiarity to the learning material and promote learner’s satisfaction.

In addition, post module feedback demonstrated that a simple and easy to follow module design was effective to learners. This may be due to the fact that a simple instructional design allows the learner to focus more on the instructional material and not on the delivery method. These results should be considered in future design projects as
instructional designers formulate their delivery media to ensure the final product enhances the learning and does not distract the learner.

Conclusion

The Skype learning module was created using two major design objectives which included applying a multimodal design approach, and incorporating the four conditional motivational factors outlined in the ARCS model in an attempt to generate a more appealing instructional module and promote learning. Cheng and Yeh (2009) explain how the ARCS model design process aims to gain participant attention, establish the relevance of the learning material, and encourage learner’s confidence to promote satisfaction and continued learning. The module gained participants’ attention and established the module’s relevance by correlating the learning material to participants’ successful completion of post secondary collaborative course work. Participant encouragement was supported by designing review questions for each module prior to taking the post module test, and designing the module to be simple to understand and easy to navigate resulting in a higher satisfaction level and participant learning.

Module results confirm that the web-based instructional module was an effective learning tool. Quantitative analysis comparing pretest questions to post test questions demonstrated that the number of participants to answer module test questions correctly either remained the same or increased for 86% of the test questions, and 100% of the participants scored the same or better on their module post test when compared to their pretest. Quantitative analysis also confirmed the module’s effectiveness when participants recorded a high level of module satisfaction, and reported that the module had helped them to learn about Skype and the Skype collaborative tools. Thematic analysis of post module survey responses confirmed that participants enjoyed the module’s multimodal design and found the simple design delivery effective. The value added by utilizing a multimodal design was reinforced through participants commending the use of Microsoft PowerPoint, PDF files, and video to present the learning material. Statements such as “I enjoyed how easy it was to navigate through your module,” and “it was easy to navigate and complete” demonstrated the effective delivery of the simple module design. However, thematic analysis also revealed that the length of the module should be re-evaluated prior to future use, as numerous participants found the module too long.

The incorporation of multimodal technology in the design process appealed to the participants and brought a technological familiarity for various learning styles. Designing the module to meet the conditional factors outlined in the ARCS model promoted learner’s satisfaction and validated the module as an effective learning tool. As technology continues to rapidly develop it is imperative for instructional designers to integrate a multimodal approach in their design process. This will provide technically savvy learners of today’s digital age a sense of familiarity as they struggle to remain proficient with the constant delivery of new technology.
References


