Podcasting to Improve Software Usage

Samuel H. Russ[1]

Abstract –Often engineering classes require students to use specialized software. Instructing students how to install and use this software can be quite time-consuming. Conversely, online video (also known as "podcasting") provides a convenient format for documenting the necessary steps, as students can watch the video on their computer while they download, install, and use software. A "training video" was developed for the installation and usage of software in an introductory microprocessor course. After deploying the podcast, the percentage of students successfully completing assignments that use the software increased dramatically, as did the average grade among students completing the assignment. Survey results from students were also very positive.

Keywords: Online video, Video instruction, Online training

INTRODUCTION AND SURVEY OF LITERATURE

Online videos, also informally known as podcasts, are being used to augment traditional classroom lectures with very positive results. (In this paper, we will refer to online videos as "podcasts" in the interest of brevity.)

There is considerable dissatisfaction with conventional in-class lectures. For example, after about ten minutes of lecture, about half of a typical class is inattentive [1]. Additionally, in-class lectures are not accessible after hours. Conversely, interactive video instruction has been shown to produce equivalent or better student achievement [2],[3].

More recent studies have shown that online videos (also called "mini-lectures" or "screencasts") improve student outcomes. For example, students using mini-lectures deployed in an introductory chemistry class showed an 11% improvement in grades, and a 22% improvement when tested on concepts that were traditionally regarded as more difficult [4]. Likewise, when screencasts were deployed in chemical engineering courses at the University of Colorado [5], surveys indicated that the overwhelming majority (91% of graduate students and 83% of undergraduates) supported the screencasts and found them useful for learning.

Podcasts have been used to provide video solutions of common circuit-analysis problems, with favorable results in surveys [6]. In [6], however, there was no indication if homework grades improved. One interesting result is that students are overwhelmingly more likely to access content if no login is required.

Podcasts do not automatically improve student grades [7]. In [7], podcasts that demonstrate the methods needed to solve homework problems were deployed without any indication of improved grades. One possible explanation has to do with the self-selection that is involved; only students who needed help with the homework, and therefore students with below-average performance, accessed the videos.

This paper describes a more specific use of podcasting, namely to instruct students how to download, install, and use course-specific software.

CREATING THE VIDEO

The course for which the podcast production was selected was an introductory microprocessors course. Like most similar courses, it requires the use of specialized software to edit, assemble (compile), and simulate computer programs.

[1] Associate Professor, University of South Alabama, 6001 USA Drive South, EEB 75, Mobile, AL 36688, sruss@usouthal.edu

This course was selected because, on one hand, the software is essential to work two homework sets at the end of the semester and, on the other hand, demonstrating the use of the software is especially tedious and unrelated to the central lecture topics in a classroom setting. It is important to note in the ensuing discussion that not only did students demonstrate significant quantitative improvement in participation and performance, but also significantly less time was spent in the classroom introducing the software.

The goal of the video was to provide a complete "end-to-end" description of not only using the software but also downloading and installing it. Preparation ahead of time was necessary. First, there was prepared a very simple three-page Powerpoint introduction to the software and how it is used. Second, Camtasia Studio software was installed. Third, the actual video required three "takes" before it was ready. By purposefully planning to make the video several times, there was less pressure to "get it right the first time".

The actual video was made on a computer that did not have the software installed. Before recording the video, the Powerpoint introduction was opened, as was a Web browser pointing to the site from where the software files could be downloaded. The video then opens with the PDF introduction and a description of which files to download. The video then demonstrates which files to copy onto the local computer, where to find an example program, and using the software to edit, assemble, and simulate the example program. By the time the video is finished, the software has been installed from scratch and used to assemble and simulate a simple program.

DEPLOYING THE VIDEO

The Camtasia Studio software created a complete package including an opening page in HTML format. Links to the software files, the example program, the Powerpoint introduction, and the video itself were also added to the opening page. (The video link permits students to copy the entire video to their computer or thumb drive for later playback offline.) The complete package was then uploaded to the instructor's website (that is, the instructor's web pages on the University website) and hyperlinked from the course's web page. It is interesting to note that the university web server did not require any additional support for streaming video as the access is file-based.

In class, only a very brief introduction to the software was made, with a few demonstrations of example programs. The students were then shown where and how to access the online video, and it was explained that they could watch and pause the video as they were installing the software for themselves.

RESULTS AND STUDENT FEEDBACK

The podcast was first deployed in Fall 2010 and, at the time it was deployed, there were no obvious results. However, when two assignments became due that required the use of the specialized software, a dramatic increase in participation was noted. For example, in Spring 2009, 57.4% of students completed the 2 homework assignments in EE 264 for a class average of 41.0%. In Fall 2010, 84.8% of students completed 2 assignments for a class average of 77.6%. That was a 47% increase in participation and an 89% increase in average grade. In Fall 2011, 88.5% of students completed the first of two assignments with an average grade of 95.2%. These results are summarized below in Figure 1.

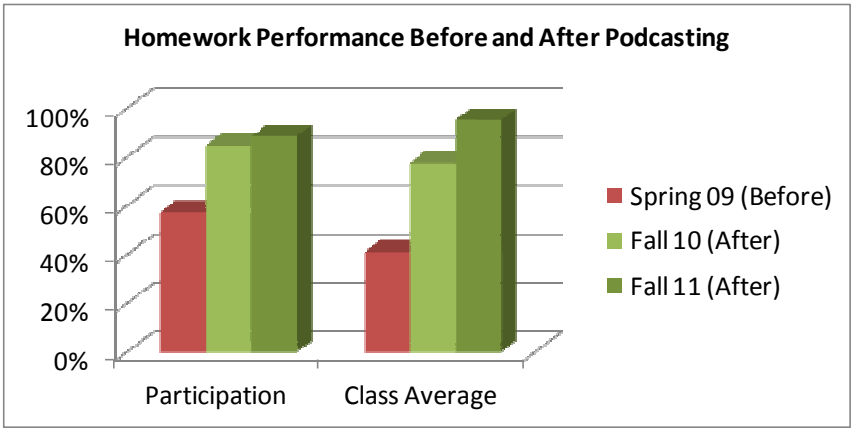

Figure 1: This shows the significant increase in participation and student grades after deploying the podcast.

An informal survey of students was also conducted in Fall 2011 to develop a clearer picture of the student perceptions of the software-training podcast and of podcasting in general. Of 20 students responding to the survey, 100% indicated that they knew where to find the video and that they had watched at least part of it. 90% reported playing it during the process of installation and to "figure out how to use the software". On a 5-point scale (where 1 indicated "strongly disagree" and 5 indicated "strongly agree") the average score of "I found this video helpful" was 4.65 and the average score of "I would prefer that more videos like this be used to explain concepts covered in class" was 4.45. When combined with the dramatic increase in homework participation, this indicates that the Podcast was very successful.

CONCLUSIONS AND FUTURE WORK

Podcasting can augment traditional classroom instruction in significant ways, but it is not a panacea [7]. By focusing podcasting efforts on tasks that consume significant class time, and which students are required to do on their own, the podcast can free up lecture time and can provide students the help they need when they need it. The results are dramatic and highlight the effectiveness of carefully planned podcasts. The podcast itself may be viewed by accessing the following link: http://www.southalabama.edu/engineering/ece/faculty/sruss/EE%20264/Podcast/MiniIDE%20and%20Wookie/MiniIDE%20and%20Wookie.html The podcast is referenced from websites for specific courses such as this one: http://www.southalabama.edu/engineering/ece/faculty/sruss/EE%20368/ee368.htm

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Samuel H. Russ

Samuel H. Russ, Ph.D. Dr. Russ is an Associate Professor in the Department of Electrical and Computer Engineering at the University of South Alabama. He received his BEE from Georgia Tech in 1986 and his Ph.D. from Georgia Tech in 1991. He taught at Mississippi State University 1994-1999, worked at Scientific Atlanta, Inc. 2000-2007, and joined the University of South Alabama in 2007. During his time at Scientific-Atlanta (now a division of Cisco), Dr. Russ authored about 40 patent applications of which 18 have issued. While at South Alabama, Dr. Russ has received awards for excellence in teaching and conducts research in embedded systems.