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Using Screen Recording and Compression Software to Support Online Learning

by Lyn Barnes, Sheila Scutter, and Janette Young

Online education, supported by online resources such as e-mail, chat rooms, and Web-based instruction, is a rapidly growing area of tertiary/higher education that has been facilitated by increased usage of home computers and advances in the development of user-friendly interfaces (Christensen, Anakwe, and Kessler 2001). A range of positive outcomes has accompanied the growth of online education, including opportunities to support greater flexibility in the delivery of educational services, allowing students to choose the time and place of educational experiences (Huang 2002; Hewitt 2003); an increase in the number of nontraditional students who may be older than traditional students, employed full-time, or geographically isolated (Christensen, Anakwe, and Kessler 2001); and the chance to utilize the vast resources of information available via the Internet.

In addition to these positive developments, however, concerns about the loss of face-to-face interactions between students and educators have emerged (DeBourgh 2003). Theories of adult education suggest that engaging learners by using a variety of media and sensory stimulation improves learning outcomes (Svinicki and Dixon 1987; Felder and Silverman 1988). However, online education characterized by e-mail, discussion pages, and other communication tools is predominately static, visual, and writing-based. Additionally, researchers have reported the lack of "connectedness" as a problem area for online students. Zielinski (2000) identifies it as a major contributor to students' decisions not to complete online courses. Thorpe (2003) relates the issue of connectedness to academic achievement, indicating that students' desire to be connected to peers at their school has an indirect yet significant effect on their academic performance. Similarly, Moore contends that "satisfaction is strongly linked to the learners' sense that the distant instructor has a social presence" (2002, 61). Initiatives and technologies that provide additional modes of interaction between teachers and learners in online learning environments thus have significant potential benefits for both groups.

At the University of South Australia, where flexible delivery of programs and courses is an important [teaching and learning commitment](#), an analysis of course evaluation questionnaires over the last five years reflected these concerns. In particular, evaluations of an undergraduate nursing research course indicated a lower level of satisfaction among students enrolled in online sections compared to face-to-face sections. Comprising a print-based study guide and a book of readings, online instruction in this course also included e-mail communication between students and teachers and an electronic discussion group, which students did not use widely. A common theme in the feedback from online students in the course was a perceived lack of connectedness to the university.

In an attempt to increase students' sense of connectedness to the university and the lecturer, we initiated a small pilot study using the screen recording and compression software CaptureCAM-PRO (CCP). CCP offered the opportunity to provide information to students in an aural form, and to link this aural information to some visible cues. Compared to similar software, CCP also offered the advantages of data compression into very small files, ease of use (with regard to both reading and recording files), and the ability to rely on relatively low-power computers (the kind many impoverished students own). Small file sizes made it feasible for students to download the CCP recordings, even when operating in rural and remote areas with slow Internet connections via modems. We hypothesized that the use of CCP files would increase students' learning and satisfaction with the course.

The principal researcher (Barnes) is the coordinator and lecturer responsible for teaching the course materials, and she produced all the CCP recordings. The dean of teaching and learning (Scutter) supported the principal researcher through the purchase of CCP for the research project. The third member of the team

(Young) provided project support by responding to students, collating information and feedback, and drafting the results report.

Methodology

Because of the smaller number of enrolled students and reduced workload for lecturers during summer term, and in order to evaluate the usefulness of this software before moving to a larger trial, we chose a summer school intensive undergraduate course to test the use of CCP. For the pilot study, the course (Professional Issues 3: Nursing Research) was offered entirely in an online format, with no campus-based interaction; all core communication was online and print-based.

Following ethics approval from the University of South Australia Human Research Ethics committee, we sent an information sheet to all students, inviting their participation in the CCP trial. The class was limited to 50 students; because enrollment was conducted online, we based participant selection on automatic closure of enrollment. The trial class included both rural and metropolitan-based students. One student withdrew from the course, and five did not complete the course for personal reasons not related to the trial. To protect the anonymity of respondents, the electronic survey tool did not collect information on their personal characteristics.

Students who chose to participate in the pilot study received their course materials in the usual way: via mail. The print-based package consists of a study guide (that is also available electronically), a book of readings, a course information booklet, and the research literature that students are required to critique for one of the assignments. This is a third-year course, so many students were already familiar with the university's online learning environment, which includes the use of e-mail, Web-based information, and discussion pages. Because CCP recordings were envisaged as an augmentation to the students' learning experience, no information was available solely via CCP files. They were used only to address specific teaching and learning issues identified during the semester. A total of 15 CCP recordings were produced.

The first CCP file was sent to students via e-mail. It included a holiday photo of the course coordinator and a voice-over in which she welcomed students and gave a brief course overview ([Exhibit 1](#)). A covering e-mail message included instructions for opening the file (with the necessary free player available from the CCP Web site) and directions to contact the course coordinator with any questions or problems during this process.

Once the course was in progress, students regularly accessed an electronic discussion group and other online materials. Subsequent CCP files were voice recordings accompanied by PowerPoint slides that summarized key points, with mouse movements underlining pertinent words and lines in the slides ([Exhibit 2](#)). The content of these files addressed key issues arising in the discussion pages, summarized key information in course content, and clarified assessment procedures.

We obtained feedback directly by asking students to report positive and negative experiences and perspectives on the use of CCP through a specific online discussion page. In addition, we used an anonymous online course evaluation instrument (CEI) to seek feedback about CCP at the completion of the course. The CEI consisted of 10 closed questions in a fixed-response, Likert scale format in which answers ranged on a five-point scale from *strongly agree* to *strongly disagree*. Six of these questions were positively worded, and four were negatively worded. The CEI also included three text-based, open-ended questions that had been developed from two sources: a thematic analysis of issues raised on the discussion page, and a review of distance education literature drawn from databases such as the Cumulative Index to Nursing and Allied Health Literature ([CINAHL](#)) and the Education Resources Information Center ([ERIC](#)). The distance education literature was initially retrieved using broad search terms such as "online learning" and then scanned for articles that dealt with issues of "interactivity," "student satisfaction," and "communication."

[Exhibit 3](#) contains the student evaluation questions. After receiving student responses, we undertook a

descriptive statistical analysis of the fixed response scales and a thematic analysis of the discussion page and open-ended CEI questions.

Results

CCP recordings were quick and easy to produce in response to students' questions or their misunderstandings of core concepts, which were identified in electronic discussion groups. It became clear that even with file compression, it was important to keep the CCP presentations to less than 10 minutes to facilitate download time on students' computers. The brevity of the presentations further helped establish CCP as an augmentation to online materials rather than a means of sending whole lectures to students, which had been considered in the early days of the project. Student feedback on this technology highlighted a number of its advantages as well as some issues related to technical support that will be addressed in the future.

Open-Ended Feedback

Of the 25 students who responded to the discussion page on CCP, 15 made very positive comments. Twenty-two students responded to the open questions on the CEI. The following excerpts reflect three key positive themes expressed by students: that CCP productions created a sense of connectedness, helped them understand the course requirements, and improved their comprehension of content.

- Capture cam greatly decreased the feeling of isolation I have become accustomed to whilst undertaking external [online] study.
- The feeling of "belonging." As an external [online] student this is difficult to achieve. To see the lecturer and hear their voice is as good as being at uni [the university].
- It has been difficult in the past to completely ascertain what is called for in assignments from printed only materials. To have a regular presentation via capture cam assured me I was on the right track and was progressing accordingly in the subject.
- Listening to information given as well as reading information improved my learning, and enables me to remember things more.
- I think capture-cam is excellent . . . This whole format is a great idea and personally I find myself much more absorbed in the course than previous external [online] courses . . . I feel I'm learning and retaining a lot of info that may have passed my permanent memory bank if it was studied in the normal format.

This feedback clearly indicates the effectiveness of incorporating an auditory sense into the learning process. Additionally, some students noted their reliance on the technology and requested that the recordings be made available at the beginning of the course; one complained of "wanting to start a new assignment and the capture-cam not being there." Several students also noted the opportunity to review CCP files "over and over" and "in my own time." These comments indicate the potential for CCP software to enhance flexibility, one of the key attractions of online education.

Likert Scale Responses

Responses to the 10 Likert scale questions also indicate that CCP increased students' learning experience and satisfaction. Twenty-eight students, or 63% of those who completed the course, completed the Likert scale questions on the CEI. Their responses consistently correlate with the above themes and comments, as we demonstrate in [Exhibit 4](#) and [Exhibit 5](#). Between 71% and 92% of all responses were positive, with most of respondents choosing *strongly agree* or *agree* (*strongly disagree* or *disagree* for the negatively geared questions) for all but three questions.

The three questions to which students responded with slightly less enthusiasm addressed the level of involvement engendered by CCP (Q6), the timeliness of CCP file delivery (Q8), and the time savings of CCP

recordings (Q10; see [Exhibit 3](#)). However, the difference in the response pattern with these questions is mostly due to a higher proportion of students choosing *agree* rather than *strongly agree*, indicating that they still thought CCP recordings had a positive impact despite any issues that arose in using the technology. We speculate that question 6, with its focus on "involvement," may have been difficult to answer since it is a relatively nebulous concept with no clear point of reference (in comparison to question 4, for example, which asked students to reflect on whether the CCP recordings helped to improve their understanding of course requirements). Students' responses to question 8 indicate their dependency on the CCP files, as noted in our thematic analysis above; students' negative responses to question 10 reflect concerns about technical issues, as noted below.

Technical Issues

Initially, only one student contacted the coordinator to relate problems downloading. However, after the first few CCP recordings were sent, several students made contact, saying that they realized from others' comments in the discussion group how useful the program was—and admitting that they had been unable to access the e-mailed files. Obviously they did not have the necessary player. The problems that students reported were all related to a need for technical support, which was supplied by either e-mail or telephone. To overcome such problems in the future, we will put the CCP player on a compact disc and mail it to students as part of their online course package.

Conclusion

The results of this pilot study suggest that CCP applications can increase teaching presence and thus improve students' educational experiences. Overall, student feedback regarding the capacity of CCP to enhance the learning experience was very positive, and there were few technical difficulties. In reviewing the online course discussion, we further noticed that the coordinator's deliberately informal and comfortable style established a clear rapport with students that increased their sense of connection.

The pilot study indicates that instructional technologies like CCP can be integrated into courses in order to improve subject learning and professional development. However, these technologies should not suggest to students that limited information technology skills will undermine their learning. Lieblein (2000, 167) thus notes the need for technical support for both students and educators. Moreover, as many educators have argued, the level of expertise and comfort with technology that instructors bring to their courses is crucial to the implementation and success of technical initiatives (Ainley, Banks, and Fleming 2002; Lieblein 2000). As DeBourgh comments, "it is the quality and effectiveness of instructor and instruction, not the technology, that is associated with satisfaction" (2003, 149).

In our test course, CCP proved to be a useful tool for improving connectedness and learning. If properly situated in learning environments that include appropriate technical support and enthusiastic, capable instructors, future applications of CCP can benefit both students and teachers in distance learning programs.

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