

Strategic Initiative Grant Final Report
Funding Period: Spring, 2007-Spring, 2008

Project Title: To Enhance Student Learning Through the Use of Technology by Conducting a Pilot Study Concerning the use of a Classroom Capture System

Project Category: Strategic Initiative Grant

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Concise Project Summary: There has been a lot of interest on campus concerning the idea of Web and or Podcasting of course material for UMB students. We purchased a classroom capture system that allows us to capture, record, archive and publish classroom content via the web. Universities around the world are currently utilizing these types of systems and students and faculty are embracing these forms of online lectures for their ability to improve the quality and efficiency of classroom interaction.

The intent of this project was to research, evaluate, purchase and install a classroom capture system in one of UMass Boston's distance learning classrooms to enable us to conduct a pilot study to determine whether such systems can be an effective tool to enhance the learning experience for our students and reduce language barriers.

Project Goals

The goal of this project is to implement a cutting edge classroom capture system at UMB that will impact our student's learning experience through the use technology by automatically producing Web-based Versions of the classroom experience for on-demand student review. This system can also be used to capture "Guest Speaker" presentations given to face to face classes and then make those lectures available as resources for future face to face and on-line classes. The classroom capture system could also be utilized in the future to record and archive faculty training workshops. This way faculty who are too busy to attend face to face to workshops or live out of state and teach on-line courses would have virtual access to the workshops via the web.

Project Accomplishments

Over the course of the summer 2007 I invited representatives from three companies that produce classroom capture systems to come to UMB to provide us with product demonstrations of their respective systems.

I invited sales representatives from Sonic Foundry, Anystream and Accordent to come to UMB to demonstrate their classroom capture systems. After careful analysis my staff and I decided to purchase the Accordent Capture System. We felt that the Accordent Classroom Capture System best served our needs in terms of image quality and functionality. We also felt that the Accordent System provided superior captured images and was also the only system in our price range that offered live broadcasting of captured material.

In mid October I processed the purchase orders for the classroom capture system and related computer hardware and software that would be needed. The vendor delivered and installed the system in late December and we conducted a pilot test capture of one of our EDCG Applied Behavior Analysis multi-site classes with mixed results. We encountered some technical problems and had to invite the vendor back in early January to resolve the technical issues.

During Winter we then run some additional test sessions with the EDCG 654: ABA Extended Applications II class throughout January to debug any further issues.

In Spring 2008 we fully deployed the system and conducted our pilot study during the spring 2008 semester with 2 courses, each taught live at UMassBoston and projected via ITV to 3 additional locations: Berwyn, Pennsylvania; Chelsea and Plymouth Massachusetts. A total of 52 students participated in each of the 2 pilot courses (EdcG 653 and EdcG 655), distributed across all 4 locations.

We have utilized the system to capture content of Interactive TV Classes, to create on-line versions of our training workshops for online faculty and for administrative presentations, such as the UMass Boston branding presentation. In each case, the system has allowed us to capture live content and make it available for 24/7 viewing by our client base of students, faculty and administrators.

After our initial start up pains, we now have the system working well and have even utilized the MP3 podcasting feature.

Unanticipated Challenges, Issues or Problems

We were a bit behind schedule on this project due to some unanticipated delays encountered in getting the equipment purchase orders processed and in getting the equipment delivered and installed in our distance learning classroom. We also experienced some technical issues with the software and had to get the installer back to UMB to correct those problems. We were also recently advised that we needed to purchase additional software to implement the automated scheduling software, something we were not informed about when we purchased the system.

The hidden costs that we had encountered had an impact on our ability to conduct the Usability and Accessibility study, as we have had to use funds ear marked for the hiring of professional staff members and graduate students for third party software purchases. As with any new technology implementation we are experiencing a start up learning curve, but we were fully able

to get the system on-line for our pilot study. The reduced Usability and Accessibility study by Valerie Havens, and the collection of staff and student data were collected as Inkind contributions. The information gathered from these two sources contributed to our understanding of the potential use and challenges when implementing a capture system with additional courses, trainings and events. See summaries from both evaluations in the following sections of the report.

Accessibility and Usability Evaluation of the Capture System

Ms. Valerie Havens, Ross Center for Disability Supports Assistive Technology Specialist, went through selected clips from the captured audio and video recording of the actual pilot courses. Her focus was the accessibility and usability of the captured course content for people with visual impairments. Ms. Havens, who is blind, provided the following summary of her findings:

1. All clips opened easily and the videos played. I was not able to find a way to stop the video the read the accompanying text.
2. I clicked on the chapters and none of them opened. If there was any written text I didn't find it in them.
3. I was able to navigate easily between the frames embedded with the video.
4. I was able to open the PowerPoint slides, but I could not read the text on them.
5. I could not navigate on the snap shot page at all or open any of the links.
6. I was not able to tell if the video was captioned in any way.
7. The audio from the video was the most useful part of this experience for me.

I have not had any training on this application. Perhaps there are more accessibility features than I see right now.

Conclusions:

To become more accessible, the following steps should be taken:

Determine a way that the text from the PowerPoint presentations captured on the video can be read. This might need to be done by generating a separate text file of the content on the PowerPoint slides.

Create a "d link" (Description of the graphic in the context of how it is being used for learning) for each graphic, and test readability within the capture system.

Add Alt tags for graphics, and test readability within the capture system.

Caption, or create a text alternative for the captured course content. This might be the text notes from the PowerPoint slides along with a description of the instructor, the setting, and the participants visible within the video.

Determine an alternate means to open links.

Explore alternative ways to present the content of the "snap shot" page.

Train IT staff and faculty in how to use the captioning system accessibly as part of the caption system training.

Always provide the audio from the videos in a separate file that can be downloaded.

Exploratory investigation of the use of Capture System to provide online learning

An exploratory study was made of the use of the Capture System to provide online learning for students who participated in the ABA Graduate Certificate Program during Spring and Summer, 2008. The purpose of this investigation of the Capture video system was to determine:

1. the usability of the technology from the student perspective
2. its contribution towards learning

Method of the Investigation

Fifty two students are participating in the ABA Graduate Certificate Program at UMassBoston during this 2007/2008 academic year. Twenty four students attend the live face to face class sessions at the Harbor campus. The remaining 28 students participate in the class sessions via live interactive ITV at 3 separate locations: Shore Collaborative in Revere, Plymouth, and Berwyn in Pennsylvania.

This Applied Behavior Analysis cohort program is comprised of five 3-credit courses that are offered sequentially between September and July each academic year. Because of delays with acquiring and testing the technology, and with IRB, the data was gathered during the last two courses of the five-course program.

All students were informed of the project at the start of class during the third course. A printed summary of the pilot's purpose and requirements was distributed along with a form asking students if they wished to participate or not participate in the pilot study. Students were also informed that they could withdraw from participating in the study at any time and would do so by emailing the program administrator. Participation meant agreeing to stay home from class on the session that was randomly assigned, watch the entire 5-hour class session via the Capture streaming video, and complete the online quiz assigned to all students (participants and non-participants) following the class session. A quiz is assigned between Friday through Monday following each class session except the first and last through WebCT Vista.

The participation forms were collected and placed in an envelope that was sealed and submitted directly to the program administrators. The instructor and site facilitator were not informed about which students were participating in the study until the end of the course. Each student is allowed one absence per course, so the instructor was not able to determine who was participating until receiving the list of names after the final quiz had been graded. Then, the list of study participants was submitted to the instructor so that class participation points could be added when calculating the students' final course grades. Students were also allowed to "drop" their lowest quiz score when final points were computed.

The program administrator randomly assigned one class session per course to each of the participating students for both EdcG 653 and EdcG 655. This became their "Capture session." She recorded all of the quiz grades from each participating student, both sessions they attended, and the sessions they viewed the Capture System video.

We calculated the mean scores of the quizzes students completed following face to face sessions (MnClass), and then calculated the mean scores of those quizzes completed after watching the Capture video at home. (MnHm). Since participants completed only 1-2 sessions using Capture video, the results are only suggested indications of what a larger study might reveal.

Quiz Scores

At the individual student level, we did not find any consistent differences between quiz scores of those who participated in the face to face or ITV courses, and those who viewed the course session via the capture system. Of the 21 participants, 14 improved their mean scores when using the Capture system. This improvement ranged between .8 to 16 points. Two students achieved the same mean scores when comparing quizzes taken following face to face sessions and Capture sessions. Five students earned lower scores when comparing the means of the Capture quizzes with those taken following face to face quizzes. The range of the lower mean scores was between .8 to 17.2 points.

At the individual quiz level we also did not find any consistent differences. When comparing mean scores, students earned higher scores during the Capture sessions in three quizzes, and lower scores on two quizzes. However, the range of differences was much smaller. The higher Capture mean scores ranged from 1.2 to 5.8, and the lower Capture mean scores ranged from .3 to 1.4

Overall, the Capture system did not appear to negatively impact the quiz scores.

Student Interviews: Technology Usability

One third of the students were randomly selected to be interviewed by phone. The eight interviewees represented each of the four locations. They were asked to rate 7 items on a scale of 1-6, with 1 representing Extremely Difficult, and 6 representing Excellent. Questions about the technology revealed that students found it to be quite usable. The only concerns expressed were from 2 students who were unable to hear the questions and interactions with classmates from ITV sites when viewing the Capture sessions. This concern was only expressed by students whose sessions were early in the pilot, so it is possible that this issue was corrected. One student had difficulty with overall volume, but thought that his computer could be the culprit. Another student had difficulty viewing the PowerPoint slides on the video because of a glare on his screen. The static caused by paper shuffling and chair movement was annoying for one student, particularly from the Pennsylvania site that has several powerful microphones. A major benefit expressed by most of the students interviewed was the ability to pause the Capture system and pace the viewing, based upon their own schedules. Only 2 of the 8 students rated the technology at a 3. All others rated the technology usability at an average of level 5 on a 6 point scale.

Going forward, students might benefit from explicit instructions to conduct a “computer check” for volume and glare. We might ask the participating ITV sites to mute their mics

when not interacting with the instructor or classmates as a way to limit the extraneous noise.

Student Interviews: Impact on learning

Students were asked questions about the Capture system's overall contribution to learning, how it matched their own particular learning style, and if the lack of immediate access to the instructors limited their learning. Only two students out of 8 rated contributions to learning as a 3, and both indicated that their learning styles require structure gained from being part of a live group. The remaining six students averaged a level 5 when rating the contribution of the Capture system to their learning. Half of those reporting from an ITV site stated that the experience was not much different from attending the ITV site live. Five of the 8 felt that, while they rated the Capture system high, they would prefer a balance of 50% Capture and 50% live class sessions per course. Even though they felt that classmates asked questions that were videotaped as part of the Capture session, and that these questions were often ones they would have asked, they also expressed a desire to be part of a "live" group of colleagues. Most students preferred to be given a number of class sessions that they could watch via "Capture system" depending upon their own personal schedules and demands rather than being assigned specific courses. Through the pilot several were able to expand their comfort level with online learning. Three important points made by students could explain this level of comfort.

First, the students had already participated in three courses that followed the same routines and expectations and ways to obtain course materials such as readings and PowerPoint slides in advance for class sessions. The movement to online video was not a "great leap" since it maintained a familiar course presentation.

Second, all students mentioned that the level of instructor organization and number of relevant examples to illustrate course content reduced their need to ask questions. Only three of the 8 students mentioned that they wrote down questions that arose when watching the Capture system video and emailed the instructor. All were satisfied with the quick response they received.

Third, students enroll in the program because they are motivated to complete the coursework in preparation for a national examination that will benefit them professionally. Their personal motivation increases the likelihood that they will attend in any format.

Budget:

Below is a breakdown of the expenses incurred for this project

Classroom Capture System -	\$11,985.00
Server Software -	\$427.71
RGBHV Distribution Amplifier -	\$735.00

Capture Station Computer -	\$1,186.03
IT training and faculty support person (8 hrs x 5 months @ \$25/hr	\$1,000
In-Kind Audio Distribution System and Wireless Microphone	
In-Kind Video Signal Distribution System	
In-Kind System Installation and Integration	
In Kind Interview faculty and students and assist with designing the project formative and summative evaluation (Mary Brady)	
Inkind Accessibility and Usability Study (Valerie Havens)	
Total Expenditures	\$15,333.66