Administrative Strategies for Designing and Supporting Large-Scale Digital Lecture Recording Environments

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INTRODUCTION

The advent of blended learning and digital recording options has complicated the challenge of administering technology classrooms. From students' perspective, "capturing" real-time student/teacher interaction is especially valuable for distance-learning applications or for those in traditionally seated environments as post-class tutorial/review. Survey evidence suggests that students highly value the convenience and flexibility of "anytime/anywhere" instructional access.

Student demand for course capture, as reflected in the recent ECAR undergraduate and IT survey (Borreson Caruso, 2007), as well as internal university research (Stephens, 2005), is driving the need for flexible "distance-learning-friendly" technology classroom designs, wherein normally displayed content can be digitally captured (with or without video showing the instructor) for later, on-demand Web-streaming or downloading (including podcasting). Ideally, a range of classroom distance-learning-friendly features can be available throughout campus – from less-complex learning spaces that include equipment to automate course-capture (and file upload) all the way to lecture halls or classrooms that all but replicate professional broadcast studio designs, with advanced lighting control, high-quality instructor/student microphones, and cameras that maximize the flexibility and quality of a class or special-event recording.

The purpose of this article is to explore technology options and strategies for large-scale classroom content-capture and the pedagogical implications of those choices.

BACKGROUND

Millennial-generation students are driving demand for flexibility and accountability in how course material is delivered (Strauss & Howe, 2007). While cherishing structure, reliability, and return on investment, students rightfully expect quality instruction, whether they attend lectures in person or view them in blended-learning or online environments. In large university settings, with diverse student populations, digital course-capture technologies provide convenience and flexibility to all students, but offer especially valuable learning benefits to students for whom English is a second language (Simpson, 2006). Milne (2007) suggests that social networks and emerging technologies are driving a paradigm-shift toward an "interaction age," in which learners attend to both content and one another in increasingly bi-directional ways. This includes learning spaces that increasingly are migrating from real-time, display-only features to digital asset management that is used to construct and deliver new knowledge. Administrators, who previously may have considered it a low budgeting priority to couple technology with flexible learning, now must consider accommodating expensive, multiple methods for course delivery, ideally by leveraging existing infrastructure (Stephens, 2003). At least one forecast from a respected technology consultant group suggests that by the year 2010, some 50% of all college and university classes (not founded on assessment of a classroom experience) will meet physically and in real-time only for exam proctoring (Zastrocky et al, 2007). In light of this, early-adopter or grassroots enthusiasm must be coupled with long-term strategic planning and administrative support in order to overcome institutional resistance to investment in instructional technologies (Kozma, 1978, 1979, 1985).

Bloodgood and Morrow (2000) identified a pattern of institutional responses when challenged by the types of market-driven innovations that Zastrocky, et al. now predict: They can adopt a "business as usual" approach and ignore competitive threats, or reconfigure existing resources (by capitalizing on internal/external

knowledge), or acquire entirely new resources (not a common action for large-scale, discretionary, campus-wide technology investments).

Adoption of instructional innovation rarely is linear. New technologies often are explored by faculty and students in small communities of learning (or practice), until a cascade of events brings them to the "tipping point." Bunn (2001) described administrative decision-making as a matrix that considers "timeless" institutional culture and values in making "timely" decisions, when "…technologies or environmental conditions have drastically changed."

In the case of digital lecture recordings, it is likely that the widespread adoption of digital music (legal, and not-so legal), in tandem with the market success of Apple's iPod™, has moved a longstanding telecourse delivery-model into a digital "wild-west era," wherein (as of this writing) it is fair to posit that these technologies are not simply "faddish" but rapidly are becoming essential to a mature educational landscape.

Despite such increasing proliferation, confusion prevails regarding the most useful terminology to describe these digital lecture recording options. Carnevale (2001) cited Masie Center survey research that found significant discrepancies in how both individuals and institutions identify (and use) traditional distance-learning tools that have also been used to benefit local students. Increased demand for digital lecture recording is creating new opportunities for equipment manufacturers. Burdet, Bontron and Burgi (2007) describe a work-flow and a potential solution for automating large-scale lecture recordings, but neither address nor contrast features depending upon capture methodology used (audio only, enhanced podcast or rich media). Early adopters of digital lecture recording/distribution on ad-hoc or departmental levels are wise to partner with centralized faculty and classroom support services, uniformly to expand capture opportunities at the campus level, in order to mitigate technological and pedagogical concerns.

PEDAGOGICAL AND TECHNICAL CONSIDERATIONS FOR LARGE-SCALE DIGITAL LECTURE RECORDING

Digital lecture recording/distribution is gaining popularity both for primary instruction and for tutorial review. Typically, these digital files are encoded (recorded) in one of these three styles:

1. **Audio only**, in which an instructor's voice is recorded (sometimes including student questions) into a digital file for later student access (a "pull" technology). If the file is distributed through subscription RSS feed, it is known as a podcast (a "push" technology).
2. **Enhanced audio**, in which the instructor's audio file is coupled with content normally displayed as part of a classroom lecture, e.g., electronic slides, graphics camera, or computer output. When subscribed to as a podcast, it is known as an "enhanced podcast."
3. **Rich media**, in which the instructor's audio and real-time video image are synchronized with presentation material. Rich media generally is captured and later displayed in one of two ways:
   a. *Dual-screen* (a.k.a. "side-by-side") *capture*, in which two content windows are present continuously – one for the video camera that captures the instructor's image/gestures in full-motion video, and a second (often larger) window that creates a series of JPEG or flash-file "snapshots" of the instructional support content normally displayed during a lecture. Depending upon the capture equipment's flexibility, students may have viewing options during playback, including how the content windows are displayed, or searchable text embedded in a content window. Several manufacturers are integrating options that allow content and audio files to be combined and published independent of the instructor's full-motion video window, creating a separate enhanced-podcast download file.
   b. *Single-screen broadcast style*: Replicating a commercially produced telecourse-style presentation, in which an operator can select/blend multiple sources, using a video switcher in a television studio-like control room. When a class is complete, it is delivered to students as a full-motion video-on-demand streaming file (a.k.a. webcast or coursecast) or delivered by subscription as a video podcast, (a.k.a., vodcast).