



Effective Streaming Media For Teaching And Learning

Strategies For Educational Institutions And The Enterprise

Overview

- An IT Strategy
 - Building a sustainable capacity
 - Creating options
- Meeting the Mission of eLearning with Streaming Media
 - Six examples
 - Assessment
- Production Organization
- Tools and Technologies Strategy
- A Few Tips

The Mission of Technology in an Educational Institution

- Deepen the Learning Experience
 - Direct Learning Experiences
 - Indirect Learning Experiences
- Community Building
- Improving Business Operations
- Creating new knowledge

HARVARD | BUSINESS | SCHOOL

Have an intranet strategy

What is the objective?

- To create a sustainable capacity to produce and deliver high-quality content and tools
- Define a strategy that makes this possible
 - Create options

HARVARD | BUSINESS | SCHOOL

Have an intranet strategy

- all applications web-based
- open, public standards and protocols; platform and browser neutral
- no proprietary client-server pairings - no platform "lock-ins"
- pluggable components and pieces
- internal development capacity
- focus on building tools
- leads to "critical mass"

Anytime, Anywhere, Any computer (Any device)

HARVARD | BUSINESS | SCHOOL

How does streaming media support learning?

- Pre-framing the debate
- Providing a richer experience of content
- Bringing the world into the classroom
- Discovering new knowledge
- Building foundations
- Reaching new audiences

HARVARD | BUSINESS | SCHOOL

Demo: Pre-framing the debate

- Students review material prior to class
- Required to “interact” via an on-line poll
- Faculty retrieve the data minutes before class
- Leverage data to guide class discussion
- Choose whether to share results with the class
 - Simple can be powerful!
 - Example: [Southwest Hiring Exercise](#)

HARVARD | BUSINESS | SCHOOL

Demo: Providing a richer experience of content

- Seeing is believing...and understanding
- Bring the content to life
- Place the student close to the action
- Show them something new
- Harley managers went on the road; so did the students
- The only way to truly understand the “culture”
 - Example: [Harley Davidson Border to Border Posse Ride multimedia case](#)

HARVARD | BUSINESS | SCHOOL

Production Organization

Multimedia Production Group - interdisciplinary group consisting of these skills:

- software engineers
- graphic designers
- video editors
- video/multimedia producers
- instructional designer
- multimedia producers **with domain expertise**

You probably already have these people on staff, but spread around different departments and areas

Bring together existing staff into a co-located group

Physical proximity is important!

HARVARD | BUSINESS | SCHOOL

Production Professionals!

There's a reason that videography, audio engineering, video production and editing are professions

The quality of the production will strongly affect the user experience of your content

Examples: [one way](#); [the other way](#)

HARVARD | BUSINESS | SCHOOL

Demo: Bringing the world into the classroom

- Where: Alcoa Aluminum, Indiana
- Why: Study of plant safety measures
- Who: Professor Dave Upton, TOM faculty, and 900 MBA students.
- How: Combined a live satellite feed, multi-camera shoot, and live web casting
- Students were able to examine the actual production area
- Questions answered live by Alcoa representatives
- Facilitated immediate class discussion
- Content captured for future case video development
 - [History](#) [Injury](#) [Improvements](#) | [Final Lesson](#)

HARVARD | BUSINESS | SCHOOL

Demo: Discovering new knowledge

- Used multimedia to tell a story in “real-time”
- Faculty wanted to show the experience, not write about it
- Non-linear access to all material
- Created a personalized view of the protagonist
 - Revealed greater insight to the situation
- Example: [Paul Levy: Taking Charge of the BIDMC](#)

HARVARD | BUSINESS | SCHOOL

Assessment

- Why bother?
- Don't be the only person saying "wow!"
(It'll be a pretty lonely "end of project" party)
- The truth can be painful, but helpful

"...it's a pain to do online cases...can't read at gym."

(MBA Student)

"...nice to see and hear the protagonist, but the trade-off is time, which HBS students don't have a lot of."

(MBA Student)

HARVARD | BUSINESS | SCHOOL

Assessment

- Difficult to create effective tools and content without
- For many, it's still a "new" way to learn, teach, and interact
- Build on what works, then take it in a new direction

"...real-time filming, as opposed to (case) writing in retrospect, was very effective."

(MBA Student)

"...gave depth to the protagonist that is difficult to read in a paper case."

(MBA Student)

"Viewing together by living group was also useful."

(Executive Education Participant)

HARVARD | BUSINESS | SCHOOL

Demo: Building Foundations

- Class time is precious!
- Lecture-oriented material can be delivered on-demand, leaving class time for focused discussion and interaction
- Can be replayed at will for better understanding of content, language issues
- Becomes an ongoing resource
- Examples include:
 - Introductory presentations
 - Highly technical lectures
 - "The Basics" students should have already learned before this course
 - Demo: [Bond Math Tutorial](#)

HARVARD | BUSINESS | SCHOOL

Distance Learning

- What it will offer:
 - Reach new audiences
 - Convenience and accessibility for all students
 - New ways to deliver to existing audiences
 - Time and place shifting, review archives, collaborative projects
 - Create archive of "best of" material on various topics
- What it will not offer:
 - Major cost-cutting
 - Less work for teaching staff

HARVARD | BUSINESS | SCHOOL

Effective Distance Learning

Basic Rules for Effective Distance Learning

- "Information is not instruction" (M. David Merrill, Utah State University)

HARVARD | BUSINESS | SCHOOL

Effective Distance Learning

Basic Rules for Effective Distance Learning

- "Information is not instruction" (M. David Merrill, Utah State University)

- "To succeed, distributed learning must balance virtual and direct interaction in sustaining communion among people."
(Chris Dede, Harvard Graduate School of Education)

HARVARD | BUSINESS | SCHOOL

Distance Learning Hybrid Course

Michael Porter's "Microeconomics of Competitiveness" Course

- Taught at HBS and 17 other educational institutions (for now)
- Implements a hybrid model of distance and facilitated learning that's proven to be very effective
- Streaming media is a critical component in making this program possible

HARVARD | BUSINESS | SCHOOL

Demo: Distance Learning

What happens in Boston

- Teaching group meets to plan lesson strategy
- Course lecture is given to local audience
- Case discussion follows lecture

HARVARD | BUSINESS | SCHOOL

Demo: Distance Learning

What happens at Affiliate sites

- Affiliate instructors and admins view streaming tutorial to learn how to use the course mgt tools ([view](#))
- Affiliate instructors listen to teaching group meeting via streaming audio
- Affiliate instructors watch and listen to the Boston case discussion to learn how to teach the case
- Students in class watch the Boston lecture together ([view](#))
- Affiliate instructor leads case discussion with his/her students
- Online tools allow Affiliate and Boston students to collaborate, view video archives, exhibits and documents
- Demo: [MOC Site](#)

HARVARD | BUSINESS | SCHOOL

Tools & Templates

Sustainable capacity for producing content

Process, automation, templates

Standards - don't reinvent the wheel every time

- UI design/look-and-feel templates
- Underlying technology architecture (languages, platforms)
- Reuse code

A small investment in software development capacity can yield a huge payoff

Demo: Collaborative Learning Environment tool

- [CLE Builder](#)

HARVARD | BUSINESS | SCHOOL

XML for a video presentation

```
<presentation template="templ1_320">
  <title>Microeconomics Of Competitiveness 2003 Lecture 4</title>
  <video_ref1>moc_2003_lecture_04_smil</video_ref1>
  <banner>HBSbanner.gif</banner>
  <toc collapsing="no">
    <link> The Diamond Model: Advanced Economies <start>00:00:00</start></link>
    <link> Sources Of Firm Success<start>00:00:26</start></link>
  </toc>
  <slideshow>
    <image action="crossfade" src="Slide1.jpg" transition="crossfade" start="00:00:00" />
    <image action="crossfade" src="Slide2.jpg" transition="crossfade" start="00:00:26" />
    <image action="crossfade" src="Slide3.jpg" transition="crossfade" start="00:03:29" />
  </slideshow>
</presentation>
```

HARVARD | BUSINESS | SCHOOL

XML for a Multimedia Tutorial

```
<presentation id="166" template="modules_templ" locked="yes">
  <title>Bond Math Tutorial</title>
  <module>
    <base_url>http://courseware.hbs.edu/tutorials/bondmath/static/</base_url>
    <menu url="intro.html">Overview</menu>
  </module>
  <module>
    <base_url>http://courseware.hbs.edu/tutorials/bondmath2/intro_to_bonds/</base_url>
    <menu url="ch1.html"> Introduction to Bonds
      <item url="ch1_1.html">What is a Bond?</item>
      <item url="ch1_2.html">Value of a Bond</item>
    </menu>
  </module>
</presentation>
```

HARVARD | BUSINESS | SCHOOL

Video infrastructure

Six video servers

- four dedicated to MPEG1
- two for low-bandwidth (350kbps - 20kbps)
- Unix-based (uptime currently 381 days under moderate to heavy load - 10k-20k video plays per day)

Videotools

- content management
- delivery management
- video search
- try a search at <http://video.hbs.edu>

HARVARD | BUSINESS | SCHOOL

Standards and flexibility

Media standards

- rtsp
- mpeg1/2/4
- mp3
- RealVideo/RealAudio
- SMIL1.0/2.0
- avi
- wav
- QuickTime
- au
- Screenwatch
- H.323
- Flash
- HTML/text/jpg/gif/png
- about 30 others...

Self-scaling, redundant architecture

Platforms

- Win95/98/NT/2000/XP
- Macintosh (9/X)
- Linux
- Tru64
- UNIX/HP/AIX/Solaris/SGI (server-side)
- Set-top boxes

Interoperability

- Oracle
- LDAP
- Plugin architecture
- jmf/perl libraries

Browsers

- Netscape
- Netscape 6.x/7.x/Mozilla
- IE (all)
- Opera/Safari

HARVARD | BUSINESS | SCHOOL

Delivering video to the classroom

- Improve support operations
- Available 24 x 7
 - Video is never checked out of the library
 - No one is waiting for a person to deliver it
- Provide options for faculty(e.g. non-linear access to clips)
- Key to success
 - Recruit early adopters
 - Develop and maintain standards across IT groups

Classroom Video

H A R V A R D | B U S I N E S S | S C H O O L

A Few Tips

- Content first!
 - Subject matter matters
 - Every story might not work as well
- Be clear on the (pedagogical) goals of your client
- Don't create a passive experience; do create interactivity
- Start big or start small...but start
- Be aware of time constraints for your audience
- One size doesn't fit all
 - Must create options for teaching and learning
- See your work in action
 - Attend class, constantly seek feedback, follow-up with clients

H A R V A R D | B U S I N E S S | S C H O O L

A Few Tips

Things to do:

- Build tools and scalable, sustainable processes
 - choose standards over “coolness”
 - don’t make every product a “one-off”
 - provide self-service, web-based tools where possible (this is the key to scalable processes!)
- Producers who are domain experts to assist with the translation between pedagogy and technology
- Focused, to-the-point editing of video content

Things not to do (lessons learned with an “ouch”):

- not having experienced production professionals
- too fancy or browser-specific client-side code
 - fragile
 - ongoing maintenance is costly

HARVARD | BUSINESS | SCHOOL

Thank You!

Larry Bouthillier

- Director of Software Development
- larryb@hbs.edu
 - Streaming media tutorials and articles at <http://www.emediaco.com>

Dave Habeeb

- Head of Multimedia Production
- dhabeeb@hbs.edu

HARVARD | BUSINESS | SCHOOL