Technology Convergence and the Future of Learning Spaces

Learning Space Design for the 21st Century, NLII 2004
Mark Valenti, The Sextant Group, Inc.
Agenda

- Technology Convergence
- New Kinds of Spaces
- Precepts and Assumptions
Convergence

✧ Mobile
✧ Digital
✧ Interactive

Voice over IP

Interactive Television

Cellphone/PDA
Convergence

“Unlike the current World Wide Web, the ‘Great Global Grid’ will be primarily a visual medium.”

Michael Malone, “Internet II: Rebooting America”
Convergence

“The future is already here. It’s just not evenly distributed.”

William Gibson
Author of “Neuromancer”
Networks

♦ Get Wired!
  ♦ Cat5, Cat5E, Cat 6, Cat X
  Or Optical Fiber?
♦ 10.3 % annual growth through 2006
  ♦ strong demand for advanced IT and emerging multimedia services
  ♦ interactive gaming
  ♦ HD video conferencing
  ♦ streaming/downloading media
Networks

Scientific American, January 2001

- Performance per Dollar Spent
- Doubling Time (months)
- Optical Fiber (bits per second)
- Silicon Computer Chips (number of transistors)
- Data Storage (bits per square inch)
Networks

✧ Networks

✧ Get Wireless!

✧ Wireless LAN (Wi-Fi)
  ✧ In 2000: $400 M
  ✧ In 2003: $1.6 B
  ✧ 30 million Wi-Fi networks

✧ Total Wireless Economy:
  ✧ $500 B (services, infrastructure, software, hardware, etc.)

✧ Bluetooth, 3G, i-mode, and others
Networks

Source: Operators, Pyramid Research
Networks

✧ Humionics
✧ Wearable Computing
Networks

- The new “personal server?”

“Duke to Give Apple iPods to First-Year Students for Educational Use”

“The iPods will be preloaded with such Duke-related content as information about orientation and the academic calendar; students also can download faculty-provided course content…”

Duke News & Communications 7/19/04
 Networks

✧ Internet II:
✧ By 2020 the E-economy will exceed the GNP of the US today.
The new ‘net

“Think about Internet2 like a time machine, showing us where the public Internet will be in 3-5 years.”

Ted Hanss,
Director of Application Development, Internet2
The new ‘net

- Download times for “The Matrix” DVD

More recent tests: 7 seconds!
AV / IT Convergence

✿ The impact of IT on a classroom is largely confined to cable passageways and provisions for data/telecom rooms

✿ AV is far more demanding:
  ✿ Room geometry, acoustic finishes, color, lighting, furnishings, HVAC noise, power and grounding, and conduit requirements
Late '90s AV System
Many Boxes

LAN

ELEC. WHITE BOARD

INTERFACE / DA

DVD

VCR

TUNER

SLIDE-VID

SATELLITE

DOC CAM

CAMERAS

MICS

AMPLIFIER

SIGNAL PROCESSOR

PROJECTOR

SCALER

SCAN CONVERTER

CODEC

CONTROL

DSP MIXER PROCESSOR

AUDIO / VIDEO ROUTER

ROUTER

LAPTOP

DESKTOP

VCR

DV

TUNER

SLIDE - VID

SATELLITE

LAN

DSP MIXER DSP MIXER

PROCESSOR

MICS

AMP

SCREEN

LIGHTS

SHADES
LAN
- Control
- Signal Proc
- Content

Tomorrow
Almost No Boxes
User Interface Technology

The latest generation technology control system:

- Displays XGA RGB video at native resolution
- Displays NTSC/PAL/S-Video with 256,000 colors
- Displays graphics with 64,000 colors
- 10/100 BaseT (full/half duplex) Ethernet capability
- Supports dynamic and static IP addressing
- Built in webserver
- Local RS-232 port
- Built-in mic, headphone jack, mixer, amplifier, speakers, and line-level input/output
- Stores and plays WAV files
- 16MB internal memory (upgradeable to 96MB)
- Optional 2-way RF Wireless Module, Gateway and Docking Station
RoomView gives you the ability to simultaneously view more than 250 rooms from a single screen. Customize RoomView to view by room name, location, and group.
Classroom Technology

New Kinds of Spaces

“The room is an I/O device…”
New Kinds of Space

✧ The “blended university”
   ✧ Adept at delivering education in the classroom and lab (Real Space)
   ✧ Adept at delivering instruction via the network (Virtual Space)
The Sextant Group

Digital Media

A model for a classroom streaming solution.

Classroom AV Router

Streaming A/V Router

Live Stream to Network

Digital Recorders

Media Server

Streaming Server

Rich Media Technology by

sonicfoundry
Convergence in the Classroom

✨ A model for a classroom streaming solution.
New Kinds of Spaces

The Past Through Tomorrow…
Classroom Technology

The Global Collaboratory, Syracuse University
Classroom Technology

The Global Collaboratory,
Syracuse University
Classroom Technology

St. Vincent College
Classroom Technology

The Columbus Academy
Classroom Technology

The Columbus Academy
New Learning Spaces
New Learning Spaces
New Learning Spaces

The Global Classroom
East Carolina University
Stanford School of Medicine
Department of Radiology, Lucas Expansion Education Project (LEEP)
- FRONT PROJECTION -

OVERALL IMAGE AREA 118'W x 66'H

(2) SIDE-BY-SIDE 4:3 IMAGES EACH 85"W x 66"H (110" DIAGONAL)

OR

(1) 16:9 IMAGE 117.32"W x 66"H (135" DIAGONAL)
(2) SIDE-BY-SIDE 4:3 IMAGES EACH 88" W x 66" H (110" DIAGONAL)

(1) 16:9 IMAGE 117.32" W x 66" H (135" DIAGONAL)
- FRONT PROJECTION -

OVERALL IMAGE AREA 176"W x 66"H

2 SIDE-BY-SIDE 4:3 IMAGES EACH 88"W x 66"H (110" DIAGONAL)

OR

1 16:9 IMAGE 117.32"W x 66"H (135" DIAGONAL)
56-SEATS

CONFERENCE STYLE SEATING PLAN
Planning Tools

✧ Precepts

“A rule or principle prescribing a particular course of action or conduct.”

✧ Assumptions

“Something taken for granted or accepted as true without proof; a supposition: a valid assumption.”
Example: Precepts

- New user interfaces will proliferate.
- The future of computing rests on a wireless “always on” mobile network connection.
- Wireless networking technology is advancing rapidly.
- Mobile computing devices are becoming smaller, cheaper, more powerful and better integrated.
- Students and Faculty are often nomadic.
- Major transformation potential in the research and educational environments.
- Intelligent systems and facilities predicated on personal profiles and wearable devices or cards.
- Technical Assistance when you need, where you need it.
Example: Planning Assumptions

- Classroom spaces will provide instructional tools to support both technology-enhanced and traditional instructional styles.
- A “universal” instructor’s user interface for technology systems is both desirable and necessary. This facilitates ease of use, faculty training, technical support, flexibility in room scheduling, and long-term systems evolution.
- Flexibility is required so that classrooms can be easily configured for different instructional styles from class period to class period, as well as within each class period. The notion of flexibility should also be considered in the long-term, to enable the systems to adapt over time to changes in curriculum, teaching and learning styles, and technology advances.
- The project will strive to implement advanced technologies whenever possible, recognizing that the systems must support state-of-the-art education, yet provide backward-compatible technologies as required to support existing archives and content libraries.
Example: Planning Assumptions

- The technology systems must be supportable by technical personnel and financial resources.
- The technology environment will promote the concept of shared resources and will facilitate the development and deployment of digital media across the University network.
- The project will strive to deliver seamless integration of AV, IT, and other technology.
- There will be a fluid integration of synchronous and asynchronous resources and activities.
- Bandwidth will not be a limiting factor.
- Technology solutions will support and enable precepts.
- Technology solutions will be scalable, insofar as a system in a small classroom will share attributes with a system in a large lecture hall, which will share attributes with a building-wide system, which will share attributes with a campus-wide system.
Questions?
Finis!

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