

A Web Portal for Open-Source Synchronous Distance Education

J. Mark Pullen and Priscilla M. McAndrews
Networking and Simulation Laboratory, C³I Center
George Mason University
Fairfax, VA 22030
{mpullen,pmcandre}@netlab.gmu.edu

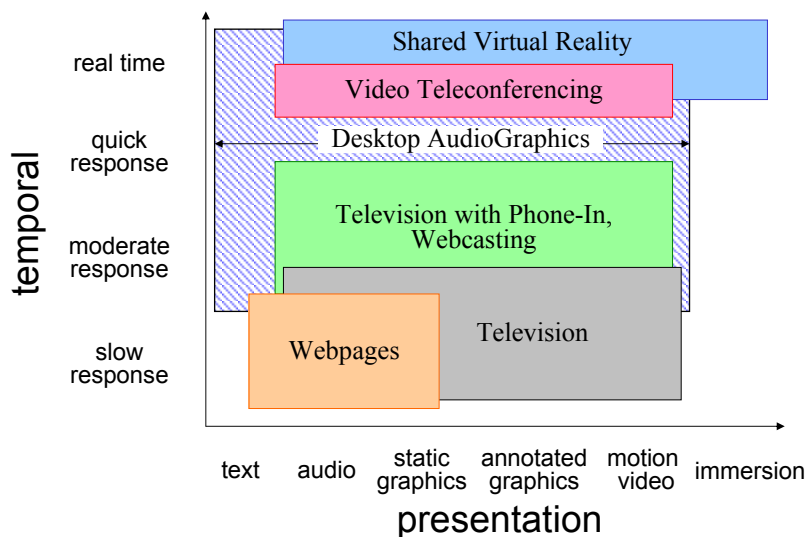
Presentation Overview

- Introduction - motivation
- The NEW software system
- Functions of the NEW Web portal
- System demonstration
- Conclusions

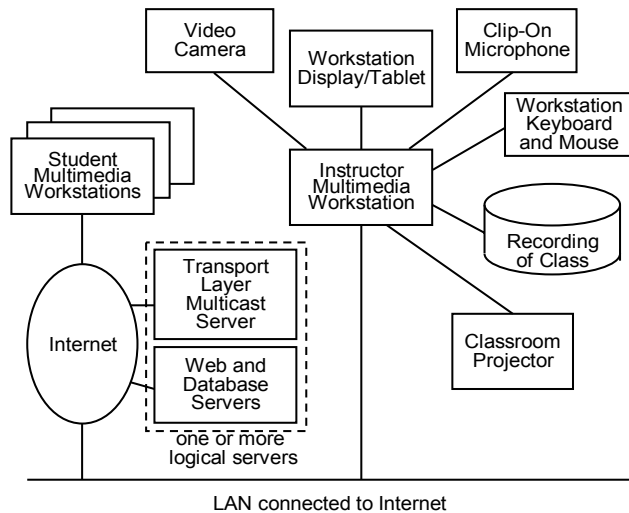
Motivation

- Experience shows instructor-led education is most effective
- Synchronous course delivery from live instructors via Internet is practical today
 - Audiographic delivery is most cost-effective
 - Best when combined with asynchronous delivery
- How to make this affordable?
 - *Simulteaching* to in-person and Internet students
 - Dialup using inexpensive personal computers
 - Record as it is taught, for missed classes/review
 - No-cost, open-source software

Temporality of Student Interaction



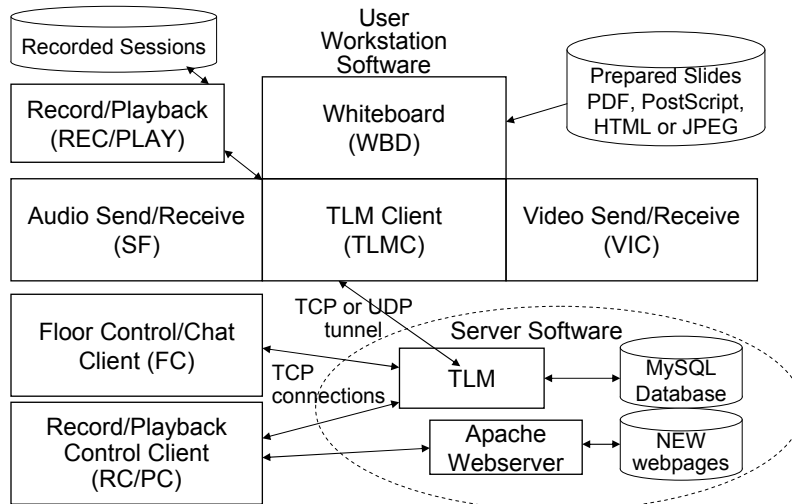
Simulteaching Setup



NEW Software Characteristics

- Works on inexpensive PC
- Works over dialup modem
- Quality: well designed, doesn't break
- Simple, robust, easy to use
- Scalable to large numbers of students
- Works despite firewalls and NATs
- Authentication and floor control

Modular, Open-Source Software



Pullen & McAndrews

CATE 2004

7

Assembled Tools - Teaching

NEW

Network Education Ware
Synchronous Internet Distributed Education

THE RECORDER IS WAITING TO BE STARTED

Department of Computer Science and C³I Center
George Mason University
Fairfax, VA 22032
mpullen@gmu.edu

© 2003 J. Mark Pullen

01Network_Educati.pdf
This Page Number: 2 Page Count: 2

Requirements for Success

- We have determined through experience:
 - Entire system, from teaching to online delivery, must be designed to be simple and robust, functioning in almost any Internet environment.
 - Quality, robust software is essential.
 - **System must make online teaching and learning easy**
 - Comparable to teaching with overhead projector
 - Software must function over low-capacity Internet connections to reach most students.
 - Use with (not in place of) email, Website, WebCT/Blackboard.

Why a Web Portal

- Simple interface to complex functions
 - Software load and test
 - Live access in multiple forms
 - Playback access in multiple forms
 - Chat rooms
- Focal point for course management
 - For instructors, database management
 - For administrators, server and webpage management
- Scalability

Preparation for Use

- Software download
 - Installs NEW Master Client
 - Other tools loaded as required by configuration files when the system runs
 - Automatic update when tools are upgraded
- Testing connection essential for success
 - ISP support may not enable adequate delivery
 - Live and Playback mode tests
 - Playback is a mini-introduction

Live Class Interfaces

- All use the same basic client
- Student interfaces
 - Basic client
 - Listen-only client
 - Video client
- Instructor interfaces
 - Teaching configuration
 - Recording configuration
 - Extra whiteboard for classroom

Chat Room

- Floor control includes a mini-chat box
 - Typed questions/comment to instructor
 - Online student chatter
 - Available only during class
- Chat rooms based on phpMyChat
 - Works through webserver and MySQL
 - One room per course, available 24x7
 - Could do this with WebCT, Blackboard, etc.
 - But phpMyChat is Open Source and free

Playback

- Uses the same client as live class
- Streaming option
 - Recording files maintained on central server
 - NEW Player streams up to 20 parallel sessions
- Download option
 - Compressed recording file on webserver
 - After download can be played offline
- Slides also available in PDF format

Management Functions

File Upload/Download

- Whiteboard accepts PDF, JPEG, HTML
 - works with any authoring system that will print under Windows
- PowerPoint and LaTeX commonly used
- PDF slides posted for download
- Authors may upload for staff to convert
- Or convert themselves and upload to server
- After class, upload recording to server

Course Status Management

- Class files status display
 - Slides uploaded/converted and dates
 - Recordings uploaded and dates
- Student database display and update
 - Course roster
 - Add a student
 - Edit student record (most often, password)

Authentication and Security

- Early versions of NEW allowed any student to join any session
 - Soon we had hackers disrupting class
- Web portal introduced security with single logon
- PHP session variables and MySQL database are used to preclude bookmarking pages/bypassing login
- Login times out to avoid tailgating entry

System Status Management

- Administrators can
 - View or modify database for any course
 - Add a course to the system
 - Initialize a new semester
 - View live and playback server status
 - Start or stop live or playback server

NEW Information Pages

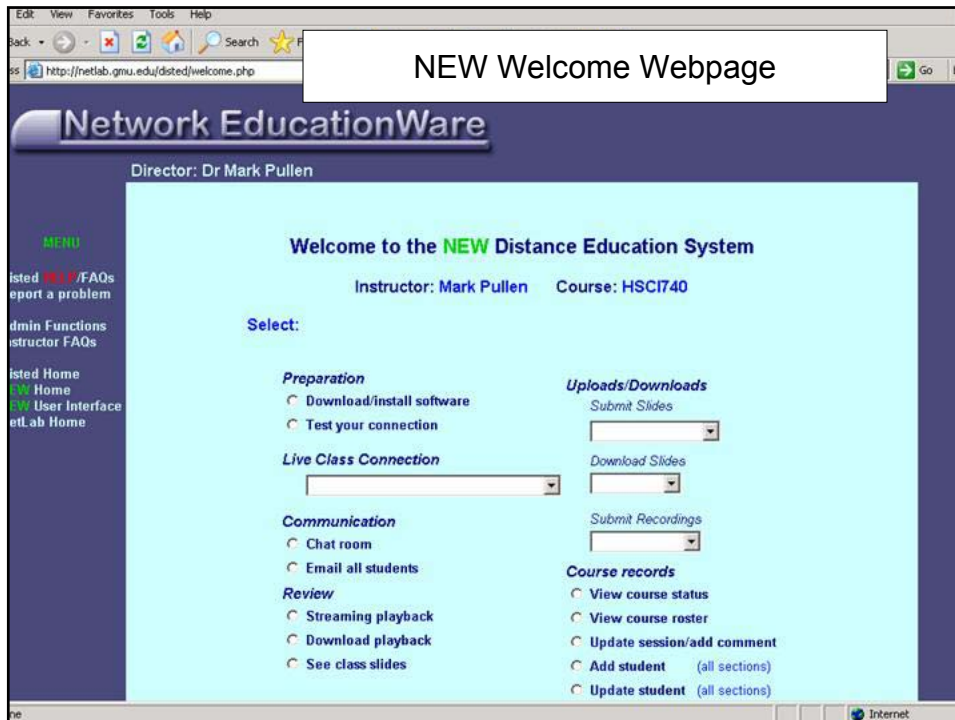
- NEW website describes development
- DEMO Portal so visitors can try NEW
- Downloads of client and server
 - Client Windows only (for now)
 - Server Unix/Linux or Windows
 - Free for all academic purposes
- Open Source available for download
 - All tools (GMU and others)

Conclusions

- Synchronous online teaching with open source software is popular with our students
 - And the faculty are growing to like it too
- Software must be simple to use and scalable
- Web portal key to ease of use
- Also to scalable management

For more information:

<http://netlab.gmu.edu/NEW>



Student and Instructor Options

Student:

Select:

Preparation

- Download/install software
- Test your connection

Live Class Connection

- Standard connection
- Connect with video (requires broadband Internet)
- Connect listen only

Communication

- Chat room

Review

- Streaming playback
- Download playback
- See class slides

Select:

Preparation

- Download/install software
- Test your connection

Live Class Connection

- Teach with recorder
- Teach without recorder
- Monitor projector
- Monitor projector with video
- Standard student connection
- Student connect with video (requires broadband Internet)
- Student connect listen only

Communication

- Chat room
- Email all students

Review

- Streaming playback
- Download playback
- See class slides

Instructor-Only Options

Uploads/Downloads

Slides

- Submit original slides**
- Download original slides**
- Submit whiteboard slides**
- Download whiteboard slides**
- Submit handout slides**

Recordings

- Submit original recording**
- Submit downloadable recording**

Course records

- View course status**
- View course roster**
- Update session/add comment**
- Add student** (all sections)
- Update student** (all sections)