Using Multimedia and Interaction to Improve the Effectiveness of Web-Based Learning
Team Members:

Dr. Susan Feinberg
John Duda
Peg Murphy
Jerry Boduch
Jim Donato
Efosa Edosomwan
Lyona Lusyana
Bhakti Panchal
Ripal Patel
Overview

- Introduction - John Duda
- IPRO 034: Phase I - Peg Murphy
- IPRO 034: Phase II
  - GUI - Ripal Patel
  - Instructional Design - Bhakti Panchal
  - Coordinating the rough ideas to html - Lyona Lusyana
  - Coding - Jim Donato & Jerry Boduch
  - Self-test - Efosa Edosomwan
  - Usability Testing - Bhakti Panchal
- Comments, Conclusions, Recommendations - John Duda
Summary of IPRO 34: Phase 1

A State-of-the-Art Assessment of Web-based Distance Education and Training

Project Sponsor: International Engineering Consortium
Faculty Advisor: Dean Mohammad Shahidehpour
Team Leader: Peg Murphy
Project Objectives

- *Conduct* a broad-based investigation of the state-of-the-art in distance education and training delivered via the web

- *Develop* a survey instrument that identifies critical measures of quality and effectiveness

- *Create* a user/instructor evaluation form and ranking system

- *Identify* key components of the most effective instructional sites as input to instructional design
Recommendations of Phase I: Components of Effective Web-based Instruction

Content
- Develop high quality content
- Establish organized and logical structure

Interface
- Develop user-centered, user-controlled interface
- Make site structure clearly visible to the user

Interactivity
- Incorporate interactivity and multimedia components
- Establish interaction between instructors and students
Graphical User Interface - Goals

- Easy to navigate site
- Consistent page layout
- Audio/visual elements on each tutorial page
Sample GUI Formats

Traditionally, IP frames are carried over T1 lines or placed within:

- Segment into Cells for ATM (asynchronous)
- Frame-Relay Frames (synchronous)
- PPP (Point-to-Point) (synchronous)

over a SONET fiber ring around the city.

Alternatives to IP Encapsulation in a Wide Area Network (WAN)

- IP packets are transmitted over SONET rings in the metropolitan area network (MAN)
- Regional Bell Operating Company (RBOC) interconnects central offices with fiber-based SONET rings
- Voice, data, and video traffic are transmitted over the MAN
- IP packets are placed on these common facilities with SONET transmission technology to deliver data in an efficient fashion for large bulk users.
Instructional Design

Limitations/Problems that were encountered:

• Confined to information from the video and accompanying notes
• Accompanying notes/slides content did not coincide with the video → hard to follow
• Our group’s background about SONET was also very limited
• Decision: Base the tutorial on video or content?
Solutions for Instructional Design

- Keep the audio but discard the video
- “Chop” the audio into sections
- Re-design all the slides to complement the audio
- Develop content for PowerPoint slides
- Storyboard PowerPoint slides to provide a blueprint for the html coders
Converting PowerPoint to HTML Pages

- Converted PowerPoint files into raw HTML pages
- Used CorelDraw to refine graphics
- Converted graphics into .gif format using Adobe PhotoShop
- Placed graphics into HTML pages using tables
- Uploaded HTML and .gif files to the website using FTP
Design Issues

MINIMUM DESIRED SOFTWARE CONFIG
- Netscape and Internet Explorer 3.0 and higher
- Modem connection at 33.6
- Resolution of 800 x 600

REQUIRED ADDONS/PLUGINS
- Adobe Acrobat to download PDF version of site
- Real Player for Audio and Video

TYPES OF SCREENS
3. Text, Video, and Audio
4. Text and Audio
5. Graphics and Audio
Examples of Technology Used

- Frames
- DHTML Style-Sheet
- JavaScript Mouse Overs
- JavaScript Pop-up Window
- Java Applet
The Basics of Internet Protocol (IP) over Synchronous Optical Network (SONET)

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CONTINUE
Traditionally, IP frames are carried over T1 lines or placed within:

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Self - Test

- Designed to test user’s understanding of content
- Asked the user to answer 7 multiple - choice questions
- Created each question in the form of a Java applet
- Designed each applet to read the user input and determine if the answer is correct
Sample Question

The Basics of Internet Protocol (IP) over Synchronous Optical Network (SONET)

2. The result will be displayed in the dialog box next to your answer.

(A) IP over SONET uses HDLC framing and point-to-point (PPP) link control.

1. True
2. False

Enter the number and press [Enter] 1 Correct

(B) IP in PPP-based HDLC frames over SONET uses more overhead than IP in ATM cells or frame-relay over SONET.

1. True
2. False

Enter the number and press [Enter] 1 Sorry: The correct answer is 2
Defining Usability Testing

Usability Testing is a methodology for having typical users perform typical tasks with a product while usability specialists record the users’ comments and actions.

You should user-test products to:

• identify users’ problems with the product
• recommend solutions to the discovered problems
• improve the product design

Important law in product testing: Know your user.

• You aren’t your user!
The Usability Testing Process for Our Website Tutorial

1. Define the objectives of the test
   • Does the user learn the content?
   • Is the site terminology clear?
   • Does the user navigate through the site efficiently using the tools and buttons?
   • Are the graphics clear?
2. Identify the tasks that users will perform at the site
3. Establish metrics for successful task performance
4. Assign team responsibilities for running the usability test
5. Collect and analyze data
6. Report findings and recommend solutions
Findings & Solutions from Usability Testing

GUI
• Improve navigation to Acronym Guide
• Include Topic Titles
• Instruct User to download PDF

Self-Test
• Include radio button feature
• Check test validity
• Place questions near content
• Provide answer feedback
Findings & Solutions from Usability Testing - Cont.

Instructional Design
- Upgrade audio delivery
- Include audio control
- Animate graphics
- Include online evaluation
Conclusion

What we did & how we did it

- Determine objective, divide the workload and assign tasks
- Make Design Choices
  - GUI (Graphics User Interface)
  - Instructional Design
- Use Streaming Technology
- Make “on-the-fly” adjustments & decisions
  - Technology issues (project needs)
  - What’s in and what’s out (time constraints)
  - Team participation issues (personal goals)
- Develop tutorial (keep the objectives clear)
- User test the product
- Judge the project’s (tutorial’s) success
IPRO 034 Findings

- Does multimedia improve effectiveness of tutorial?
  - Not in and of itself - only as an instructional enhancement
  - Instructional Design (content) is Critical (80% Solution)
  - Content Expert must be available
  - Technical Issues (Streaming etc.) are secondary
  - The GUI and its Multimedia Components enhance instruction by
    - Adding comfort and familiarity to navigation
    - Providing structure to content
    - Helping users find and use available tools
    - Stressing function over form
  - Usability Testing should not be underestimated:
    - 70% of errors were found on the first three users
    - "Palm-whack-to-the forehead" errors
    - Potential for usability testing during development