Didactics to Digital: One Health Science Program’s Journey.

Please be seated the program is about to begin.
Community College Foundation

Didactics to Digital

Ontario

Louis M. Sinopoli

TechEd99
• The Talk: 
  Didactics to Digital
  – Influences and Applications

• Our Experience with Going Digital
  – People Issues
  – Learning Issues
  – Organizational/Technology Issues

• The Road Ahead for Us
  – Reengineering of Our Curriculum
  – Why You Should Want to Come Along
Today’s Talk:

“Going Digital, the road we have traveled and the road ahead.”
**Influences:**

- **Being Digital** by Nicholas Negroponte
  - Professor of Media Technology at MIT,
  - Founding Director of the Media Lab in 1979.

- **The Road Ahead** by Bill Gates
  - Chairman & CEO of Microsoft, Cofounder in 1975.
• Digital vs Atomic
  – Customizable
  – Transferable
  – Hard Fun
Transferable/Customizable

- Digital means transferable and customizable; the atom is not as easy.
- Vangogh
Transferable/Customizable

- Digital means transferable and customizable; the atom is not as easy.
- Vangogh

Same is true with instructional & test design material!
Hard Fun

- Story from book
- Application to education, “Easy Learning”
Going Digital:
Are you Puzzled?
TechEd
Didactics to Digital
99
Community College
Foundation
Ontario, CA
TechEd 99
Louis C. Simpson
Didactics to Digital Overview
TechEd

Why we went digital

Flexible

99
TechEd
Why we went digital
Flexible
Efficient
Realism

TechEd

Why we went digital

Flexible

99

Efficient
Effective

Efficient

Why we went digital

Realism

TechEd 99

Edutainment
TechEd 1999
Digital
Technology
Didactics to
The Road Ahead
CAI
CAT
Sociotechnical Perspective: Consider the impact on each of the areas.
People Issues, Faculty:

- Basic Instructor Computer Literacy:
  - Using Word & Excel for Tests and Grading
  - Using Excel Charts
  - Using Word With Excel for Reports and Newsletters
People Issues, Faculty:

- Instructional Literacy:
  - Powerpoint & WinSim are the basis for building custom courseware (CAI & CAT).
  - Convert all classroom “lectures” to PPP.
  - Make PPPs available to students via networks.
  - Create CAT for practice and higher order problem-solving.
GIGO

If you automate a bad manual process, then you just a have a bad process that is automated!

Garbage in, Garbage out...

If you weren’t a good instructional designer and or teacher before...
CAI: Examples:

- EKG Instruction.
- Problem-Solving ABGs.
- Respiratory Care Interpretation of X-Rays.
Electrical Flow in the Heart

- SA node found on the atrium fires first.
- AV node fires next.
- EI travels down both R & L bundle branches.
- Ends up firing in the purkinje fibers.
Electrical Flow in the Heart

SA Node
AV Node
R & L BB
Purkinje Fibers
Electrical Flow in the Heart

SA Node
AV Node
R & L BB
Purkinje Fibers
Electrical Flow in the Heart

SA Node

AV Node

R & L BB

Purkinje Fibers
Electrical Flow in the Heart

SA Node

AV Node

R & L BB

Purkinje Fibers
Electrical Conduction of the Heart

- SA node conducts at a rate of 60 to 100.
Electrical Conduction of the Heart

- SA node conducts at a rate of 60 to 100.
- AV node conducts at a rate of 40 to 60.
Electrical Conduction of the Heart

- SA node conducts at a rate of 60 to 100.
- AV node conducts at a rate of 40 to 60.
- Ventricle can generate their own rate if above fail to fire, but only at a rate of 25 to 35 bpm.
People/Learner Issues

- Interactive
- Practice Available
- Problem-Solving Orientation
- Support Existing Course Content
- Add to Existing Course Content
- Engages as Many Senses as Possible
- Simulate Real World Situations
Increased Effectiveness

• Create in-class, onscreen, problem-solving situations and solicit group and/or individual participation.
Practice:

- pH = 7.60
- PaCO2 = 55
- HCO3 = 15
- Base = -10
- PaO2 = 95
- Sat % = 97
Practice:

- pH = 7.60
- PaCO2 = 55
- HCO3 = 15
- Base = -10
- PaO2 = 95
- Sat % = 97

Calibrated: 1/20/90
X-Ray Interpretation
Use in class
Leave in lab for practice
What is this angle called?

Cardiophrenic or costophrenic?

Look it up, chapter 6...

What is this angle called?
• Digitize your current tests.
• Buy test banks and simulation software.
• Use CAT authorware:
  – Learning & Testing
  – T/F, Multiple Choice
  – Complex Problem-Solving
  – Branching Simulations
CAT: Examples

• CPR in the Home
• Respiratory Care Ventilator Certification
• Radiologic Technology Critique of Films
Choose one of the following by pressing its number key:

1. Start/Run Simulation
9. Quit/Return to System/Network

Do not hold keys DOWN or press more than once when requested.

If you hear a BEEP...reread directions...a NUMBER KEY is being requested.

Press # key choice...otherwise Press space bar
You walk into the kitchen to find your Dad on the floor apparently unconscious. As you know your Dad is only 45 years old and has no history of heart disease.

WHICH OF THE FOLLOWING WOULD BE YOUR FIRST RESPONSE TO THIS POTENTIAL MEDICAL EMERGENCY?

>>>>>>> Select the ONE BEST RESPONSE <<<<<<<<<<<<<

Palpate your Dad’s carotid pulse.

1. View next choice. 2. View last choice. 3. Elect this choice. 9. Quit.
You walk into the kitchen to find your Dad on the floor apparently unconscious. As you know your Dad is only 45 years old and has no history of heart disease.

WHICH OF THE FOLLOWING WOULD BE YOUR FIRST RESPONSE TO THIS POTENTIAL MEDICAL EMERGENCY?

Select the ONE BEST RESPONSE

Begin mouth-to-mouth resuscitation (rescue breathing).

1. View next choice. 2. View last choice. 3. Elect this choice. 9. Quit.
You walk into the kitchen to find your Dad on the floor apparently unconscious. As you know your Dad is only 45 years old and has no history of heart disease.

WHICH OF THE FOLLOWING WOULD BE YOUR FIRST RESPONSE TO THIS POTENTIAL MEDICAL EMERGENCY?

>>>>>>>>>>> Select the ONE BEST RESPONSE <<<<<<<<<<<<<

Palpate your Dad’s carotid pulse.

You’ve been watching too much T.V. This is what you typically see them do first...however this is a real emergency and following proper procedure is life-saving. First...establish that he is unconscious and then follow the ABC’s of resuscitation.
MAKE ANOTHER SELECTION THIS SECTION

Press # key choice...otherwise Press space bar
You walk into the kitchen to find your Dad on the floor apparently unconscious. As you know your Dad is only 45 years old and has no history of heart disease.

WHICH OF THE FOLLOWING WOULD BE YOUR FIRST RESPONSE TO THIS POTENTIAL MEDICAL EMERGENCY?

Establish unconsciousness.

Good...this is the proper first step before any action to help the victim is started.
YOU WILL NOW BE SENT TO THE SECTION WHERE YOU SUGGESTION HAS BEEN PERFORMED AND YOU WILL HAVE TO DETERMINE WHAT TO DO NEXT.

Press # key choice...otherwise Press space bar
Simulations and Certifications

Peter Hoffman • Certified
Please point & click on the title of the section you wish to review.

Note: Text areas that are highlighted in Green indicate areas already reviewed.

Return to Main Menu
Objectives:

* Understand the use of the BAR GRAPH METER

* Understand the use of BREATH-TYPE INDICATORS

* Understand the use of Patient Data DISPLAY WINDOWS

Please click NEXT PAGE to continue.
Name: Louis Sinopoli

Introduction to the PB7200 Series Ventilator
Certificate Program Completed: NO

Advanced Options Modules Completed:
Final Options Module Test Score:

Final Test Score:
WinSim: Custom Courseware

This is a Demo version not for sale or reuse.

Register

Test

Author
This is a demonstration of the WinSim simulation authoring system.
SCENARIO

This is an X-ray of the chest.

Any digital image can be converted to a format like .wmf or .bmp for use within the simulation.

Choices 1

Click accept to continue.

Next Choice  Prev Choice  Exit

Accept
This is an x-ray for critique.

Response:
No, that is not correct.
Your point is 0

Choices 1:
The problem with this x-ray is

Next Choice  Prev Choice  Exit

Accept
SCENARIO

This is an xray for critique

Choices 1

The problem with this x-ray is

Next Choice  Prev Choice  Exit

Accept
This is a flow volume loop drawing. Any drawing that you may produce in paint or other drawing programs may be imported and use in the simulation.

Choices 1

click accept to continue

Response
Now program will end and score
Your point is 1

Next Choice  Prev Choice  Exit

Accept
**Report**

**Last name:** Sinopoli  
**Time used:** 00:06:38

**First name:** Louis  
**File name:** C:\WINSIMA\demo1.dat

<table>
<thead>
<tr>
<th></th>
<th>Information Gathering</th>
<th>Decision Making</th>
<th>Oxygen Therapy</th>
<th>X-ray Interpretation</th>
<th>Ventilator Management</th>
<th>Airway Care</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Max</strong></td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>You</strong></td>
<td>4</td>
<td>0</td>
<td>4</td>
<td>0</td>
<td>0</td>
<td>0</td>
<td>4</td>
</tr>
<tr>
<td><strong>You %</strong></td>
<td>100.</td>
<td>N/A</td>
<td>100.</td>
<td>N/A</td>
<td>N/A</td>
<td>N/A</td>
<td>100.</td>
</tr>
</tbody>
</table>

[OK]  [Print]
Organizational/Technology Issues, Classroom & Lab:

- Classroom needed to be redesigned for multimedia.
- Lab had to have space for computers and simulated ICU bed.
- Technology had to be ordered and installed.
Computers linked together primarily to share resources and databases.
A Virtual Tour of Our CAI / CAT Lab
A Learning Environment is created:

- Multimedia Classroom
- Simulation Lab for Drill, Practice and Evaluation
- Computers, Manikins, TVs, Speakers, Scanners, Digital Cameras, etc.
Technology Issues, Hardware & Software:

- Computers
- TVs
- Scanners
- Digital Camera
- Manikins
- Software

- Laptops
- PDNs
- Beepers
- PDAs
- Email
- Web Boards
- WWW Site
Information/Knowledge Management:

- Email
- WebBoard
- PDNs
Folder

news

5 messages, 4 new

<table>
<thead>
<tr>
<th>New</th>
<th>From</th>
<th>Date</th>
<th>Subject</th>
<th>Size</th>
</tr>
</thead>
<tbody>
<tr>
<td>☐</td>
<td>Hotmail WebCourier</td>
<td>Oct 01</td>
<td>USA Today In-Box Delivery</td>
<td>1k</td>
</tr>
<tr>
<td>☐</td>
<td>Hotmail WebCourier</td>
<td>Oct 01</td>
<td>NEWS.COM In-Box Delivery</td>
<td>1k</td>
</tr>
<tr>
<td>☐</td>
<td>Hotmail WebCourier</td>
<td>Oct 02</td>
<td>USA Today In-Box Delivery</td>
<td>1k</td>
</tr>
<tr>
<td>☐</td>
<td>Hotmail WebCourier</td>
<td>Oct 02</td>
<td>Slate.com In-Box Delivery</td>
<td>1k</td>
</tr>
<tr>
<td>☐</td>
<td>Hotmail WebCourier</td>
<td>Oct 02</td>
<td>NEWS.COM In-Box Delivery</td>
<td>1k</td>
</tr>
</tbody>
</table>

Use checkboxes to select messages to move or delete
Information/Knowledge Management:

- Email
- WebBoard
- PDN’s
Welcome! If you wish to participate in a web conference, please select your desired access method below:

**Guest**

Guests entering conferences are limited to read-only access

**New Users**

New users click here to create a personalized profile

Name: [ ]
Password: [ ]

Remember my password

Powered By WebBoard
software@oreilly.com
© 1995 Duke Engineering
Conferences
Conferences | 5 New Messages

- **RC Senior Students** (3, 3 New) NEW
- **ECC RC Clinical Instructors Only** (2, 2 New) NEW

*Welcome to the Web Board (Louis Sinopoli)* 09/16
*greetings from Roy ✓ (Roy Mekaru)* 10/04
Conferences

Conferences | 5 New Messages

- **RC Senior Students** (3, 3 New) [NEW]
  - Welcome to the WEB Conference ✓ (Louis Sinopoli) 09/16
  - Hello from Roy ✓ (Roy Mekaru) 10/02
  - See Me for Rules (Louis Sinopoli) 10/02

- **ECC RC Clinical Instructors Only** (2, 2 New) [NEW]
Information/Knowledge Management:

• Email
• WebBoard
• PDNs
PDNs

- Use to take notes and digitize.
- Use to document incidents.
- Use to document clinical evaluations.
- Use to communicate with other faculty.
Information/Knowledge Management:

- Beepers
- PDAs
- WWW Sites
Beepers

• Between Clinical Affiliates and Program.
• Voicemail and Paging linked.
• Extended Coverage without increased FTE.
Information/Knowledge Management:

- Beepers
- PDAs
- WWW Sites
Personal Data Assistants

- All data in portable handy format.
- Sync with desktop/laptop PIM.
  - Outlook
- Digital backups.
Information/Knowledge Management:

- Beepers
- PDAs
- WWW Sites
WWW-Sites

- Program Information.
- Announcements
  - Workshops
  - Schedules
  - Grades
- CEU
- Courses
- Advanced RC Program
Respiratory Care Program

Division of Health Sciences and Athletics

El Camino Community College
Virtual Educator

Louis M. Sinopoli's Home Page
Using Technology to Redesign the Curriculum

- “Information technology acts as an enabler that allows an organization to do work in radically different ways”

Source: Hammer & Champy
The Machine that Changed the World

- The First Phase Was About Computation!
- The Second Phase of the Technology Revolution?

Communication!
The Road Ahead For Us

- Learning Environments
  - Integration
  - Communication
- Reengineering the Curriculum
  - Flexible
  - Networks
What is Reengineering?

• “Fundamental rethinking of a process to achieve major improvements in performance, such as; cost, quality, speed and sales.”

Source: Hammer & Champy
Restructure of Respiratory Care Curriculum: Plan of Action

1. Prerequisite, recommended program, state and national requirements.

2. Curriculum Redesign of courses, sequence & content.

3. Local Approval by Fall of 99, Spring 2000.

The Road Ahead: Entry-Level Curriculum Technology Emphasis

• **In the Classroom:**
  – *Traditional lecture in multimedia interactive classroom.*
  – *Simulation software and interactive problem-solving.*

• **Outside Classroom:**
  – *CAI and CAT matched to entry courses & skills.*
  – *Labs for drill and practice.*
  – *PDNs for clinical instruction.*
Advanced-Level Curriculum
Technology Emphasis

- Virtual Classroom:
  - Course modules that have supporting CAI & CAT
  - Internet Home Page to manage assignments, tests and feedback
  - MIS to monitor progress and document
Advanced-Level Curriculum
Technology Emphasis

- **Virtual Student**
  - Works as entry-level RCP
  - Uses WWW to download/upload assignments, tests and feedback
  - Progresses at own pace and location
  - Clinical evaluations on site & uploaded as completed.
Application to A Health Science Program’s Curriculum

Development

Integration

Reengineering
What Does the Virtual Educator Need
Current Instruction Converted to Digital
Reengineering of the Coursework
What do you need to be a “Digital Didactician”

Levels of Virtual Educator Skills
Virtual Educator
Skills Development

• Level I:
  – Uses WP to produce tests, handouts, schedules, etc.
  – Uses WP, graphs, and spreadsheet for budgets, reports, surveys, etc.
• Instructional Literacy Level II:
  – Uses Powerpoint, Astound, etc., to develop lectures and enhance delivery.
  – Uses simulation authoring programs to teach and test matched to coursework.
Virtual Educator Level III

- Virtual Educator:
  - Reengineers the delivery & focus (teach/student-centered) of instructional modules suitable for distance learning
  - Manages students and courses using Internet, E-mail, WWW, Web Board, chat, conferencing.
What skills do you need to go digital?

• Basic Computer literacy & familiarity with education technology
• Virtual Education literacy
• Instructional Design Skills
Why Should You Want to Become a Virtual Educator?

The world is changing fast, many professions have gone through downsizing, rightsizing, reengineering, etc., education is next. We are still using a primarily industrial model for education, cult of efficiency, production paradigm. Going digital may also help us achieve:

“Education for One.”
“Times they are a changing”
Education is beginning a shift to new ways of delivering education, ways that use technology...the fundamental principle behind major change and reengineering in a field is new technology.
In Medicine, Radiologists may have to give up the “film”, radiology specifically and medicine in general are all going digital!
Going Digital

CPR?

• Computerized Patient Record
### Problem List:

<table>
<thead>
<tr>
<th>Problem</th>
</tr>
</thead>
<tbody>
<tr>
<td>1 Varicella</td>
</tr>
<tr>
<td>2 Hyperactive Airway (HAAD)</td>
</tr>
<tr>
<td>3 Bronchopulmonary Dysplasia</td>
</tr>
<tr>
<td>4 *Asthma OP</td>
</tr>
<tr>
<td>5 Chronic Otitis Media</td>
</tr>
<tr>
<td>6 Developmental Skills Delay</td>
</tr>
<tr>
<td>7 Speech Delay</td>
</tr>
<tr>
<td>8 Hearing Deficit</td>
</tr>
<tr>
<td>9 Esotropia</td>
</tr>
<tr>
<td>10 Myringotomy</td>
</tr>
<tr>
<td>11 Dental Carries and Extraction</td>
</tr>
</tbody>
</table>

### Visit History:

<table>
<thead>
<tr>
<th>Visit History</th>
<th>Date</th>
<th>Service Type</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Sep 95</td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>2</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>3</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>4</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>5</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>6</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>7</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
<tr>
<td>8</td>
<td></td>
<td>Pediatrics OV</td>
</tr>
</tbody>
</table>

### Prescriptions:

<table>
<thead>
<tr>
<th>Prescription</th>
<th>Date</th>
<th>Dosage</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Zovirax</td>
<td>27Nov95</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Albuterol*</td>
<td></td>
<td>1mg/tid</td>
<td>continue</td>
</tr>
<tr>
<td>Slo-Bid</td>
<td></td>
<td>75mg/tid</td>
<td>continue</td>
</tr>
<tr>
<td>NS Drops</td>
<td></td>
<td></td>
<td>continue</td>
</tr>
<tr>
<td>Prednisolone</td>
<td></td>
<td></td>
<td>/bid x5day</td>
</tr>
<tr>
<td>Amoxicillin</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Med Neb Tx*</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Debrox</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

### Reminders:

- Sep 95: continue speech therapy and PT at home by Pediatrician, Colleen, MD.

---

*Note: The image shows a computer interface with patient information and medical records. The red boxes highlight the 'Problem List', 'Visit History', and 'Prescriptions' sections, while the blue boxes indicate 'Reminders'.
CT Report along with image
Schools, colleges and universities are starting to deliver more “online courses” than they ever have, and it is growing
ONLINE
EL CAMINO COLLEGE

Welcome

Online Classes

C Home Page

Distance Education

Web Conferencing

More Information

Please send comments and suggestions to: Howard Story
Application to A Health Science Program’s Curriculum

<table>
<thead>
<tr>
<th>Development</th>
<th>Integration</th>
<th>Reengineering</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>People:</strong></td>
<td><strong>Technology:</strong></td>
<td><strong>Organization:</strong></td>
</tr>
<tr>
<td>• Resistance</td>
<td>• Hardware</td>
<td>• Curriculum</td>
</tr>
<tr>
<td>• Training</td>
<td>• Software</td>
<td>• Budgets</td>
</tr>
<tr>
<td>• Support</td>
<td>• Organization:</td>
<td>• Environment:</td>
</tr>
<tr>
<td></td>
<td>• Construction</td>
<td>• State Board</td>
</tr>
<tr>
<td></td>
<td>• Budgets</td>
<td>• CoARC</td>
</tr>
</tbody>
</table>
Downsides?

You can get trapped in the “Technology Box”

HIGH-TECH

CAI, CAT, DISTANCE ED...
When Technology Fails, Backups: Transparencies, Disks, Computers, HardCopy
• Communicating in more than one cognitive style at a time increases the likelihood that you are keeping everyone involved and excited.

• By controlling the flow of the instruction, you can build excitement to complex conclusions that accomplish components of the instruction.

• Educating with colors, flying words, transitions, audio, video, etc., is similar to entertainment and can be exciting.
Digital is better because it may:

- Increase **Efficiency**
- Increase **Effectiveness**
- Increase **Excitement**
- Increase **Delivery Modes**
- Increase **Persistence**
- Increase **Retention**
Benefits Review

• Meet the increasing competition.
• Students like it.
• High-tech professions, low tech teaching?
• The paradigm is shifting, digital is the direction
Learn these new skills because...

- Teachers need these skills to design digital instruction.
- Colleges need to offer digital programs to their diverse populations.
- You and your program’s survival may depend upon it.
Where Can You Learn These New Skills?

- TechEd 99
  - Pre/Post Conference CAI/CAT
- Custom Workshops
- Other People/Workshops
- WWW Conferences