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<tr>
<td><strong>Author(s)</strong></td>
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Learning in a Networked Multimedia Environment

Professor Chun Ming LEUNG
Director of Technology Development
The Open University of Hong Kong, Hong Kong

Easy access to the Internet from home and workplace, coupled with advances in information technology, are reshaping education and training by providing new learning environments and new ways to learn. The educational paradigm in the next century will likely be a combination of synchronous, interactive learning and asynchronous, online instruction, with just-in-time learning and on-demand teaching becoming more prevalent. In recent years, Web-based learning (WBL) has been successfully implemented in distance learning, corporate training, and as a supplement to traditional classroom teaching. WBL is a learning environment for delivering (synchronously and asynchronously) interactive multimedia education using the World Wide Web as a communication medium. WBL is more than just posting course materials on the Web. It is a constructive method for course delivery and management, based on a tight integration of study materials, course assessment, student feedback and communications among students and instructor, with an emphasis on connectivity, interactivity and the use of hypermedia. The potential of WBL for improving teaching efficiency and learning effectiveness has been recognized. WBL enables learning modes that are not possible using traditional means. It has many of the attributes emphasized in the recent paradigm shift towards interactive, collaborative, and student-centred learning. In this talk I will give an overview of the philosophy, ingredients and impact of WBL. I will also identify the pedagogical issues and implications of learning in a networked multimedia environment.
Outline of Talk

- Learning Environment
- Technology vs. Pedagogy (I)
- Technology vs. Pedagogy (II)
- Technology Drives Pedagogy

Learning Environment

**Provider**

Provider -> **knowledge (medium)** -> feedback mechanism

Provider -> **delivery method** -> Learner

**Learning involves communications!**

Technology vs. Pedagogy (I)

**Asynchronous**
- printed materials
- audio cassettes
- video cassettes
- CD ROM, DVD
- Internet (e-mail, text chat)
- WWW (interactive, multimedia)

**Self-Paced**
- correspondence course
- audio / videotape
- computer based training
- online training via Internet (text based, e-mail)
- Web-based instruction (interactive, multimedia)

Technology vs. Pedagogy (II)

**Synchronous**
- audio conferencing
- audiographics conference
- video broadcast
  - satellite
  - instruction TV
- video conferencing
  - satellite
  - ISDN (group / desktop)

**Live Interactive**
- audio tele-training (2 way)
- audiographics conference
  - 2 way audio, digital stills
- video broadcast
  - 1 way video, 2 way audio
  - interactive video conference
  - 2 way video, 2 way audio
  - [deliver instructors on site]

Technology Drives Pedagogy

**Technology**
- asynchronous
- synchronous

**Pedagogy**
- self-paced
- live, interactive
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**Question**

Can we have a learning environment that

- combines the best of both approaches (synchronous & asynchronous),
- is technologically feasible and
- pedagogically sound, but
- is affordable?

**Internet Explosion**

<table>
<thead>
<tr>
<th>Year</th>
<th>Worldwide Internet Hosts (in millions)</th>
</tr>
</thead>
<tbody>
<tr>
<td>1/1995</td>
<td>5.8</td>
</tr>
<tr>
<td>1/1996</td>
<td>14.3</td>
</tr>
<tr>
<td>1/1997</td>
<td>21.8</td>
</tr>
<tr>
<td>1/1998</td>
<td>29.6</td>
</tr>
<tr>
<td>1/1999</td>
<td>43.2</td>
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</table>

**Web-Based Learning**

**What is WBL?**

WBL is a learning environment for delivering interactive multimedia education using the WWW as a communication medium.

**Components of WBL System**

**Information**

- requirements
- schedule
- teaching staff
- student contact info
- photo album
- FAQs
- links

**Study Material**

- study guide
- lectures
- tutorials
- glossary & index
- FAQs
- resource materials
- downloaded archives

**Components of WBL System**

**Communication**

- announcements
- e-mail
- threaded discussion
- interactive chat
- white board
- student presentations
- FAQs

**Assessment**

- requirements
- schedule
- assignments
- past assignments
- quizzes/exams
- past quizzes/exams
- view progress

**Example**

**OUHK Online Learning Environment**

(www.ouhk.edu.hk)
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**Educational Benefits**

- **by doing** (hands-on exercises, explorations)
- **by doing** (hands-on exercises, explorations)
- **by interactive & cooperative techniques** (discussions, group projects)
- **by immediate application & follow-up** (online drills & tests, in-class assignments)

**Learning Is More Effective...**

**Changing Educational Paradigms**

<table>
<thead>
<tr>
<th>teacher-centered</th>
<th>learner-centered</th>
</tr>
</thead>
<tbody>
<tr>
<td>teacher as transmitter</td>
<td>learner as facilitator</td>
</tr>
<tr>
<td>instruction</td>
<td>construction, discovery</td>
</tr>
<tr>
<td>absorbing materials</td>
<td>learning how to learn</td>
</tr>
<tr>
<td>linear, sequential</td>
<td>hypertext learning</td>
</tr>
<tr>
<td>individual work</td>
<td>cooperative learning</td>
</tr>
<tr>
<td>specialized, disciplinary</td>
<td>interdisciplinary</td>
</tr>
<tr>
<td>stable content</td>
<td>just-in-time learning</td>
</tr>
<tr>
<td>one-size-fits-all</td>
<td>customized</td>
</tr>
<tr>
<td>one-time learning</td>
<td>continuous, life-long</td>
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**Learning in a Networked World**

**Implications & Outlook**

**Communication Networks**

**The Learning Matrix**
**Interactive Distance Education**
*(in Physics)*

- 1997: USA – Hong Kong (graduate students)
- 1998: USA (high school students)

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**Course Information**

"Survival Skills for Research Scientists"

- for graduate students in physics
- from late January to mid-April, 1997
- 10 weekly sessions, each 1-1/2 hours long
- classes start at 7 am in US, 8 pm in HK
- homework, in-class exercises, grant proposal, oral presentation, no exams

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**Course Logistics**

*In-class communications*
- video and audio — PictureTel (30 fps)
- data — internet using LearnLinc

*Communications outside of classroom*
- announcements by electronic mail
- homework submitted in electronic form by ftp, graded and returned electronically by ftp
- course notes distributed in printed form

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**Equipment Setup**

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**Course Information**

"Introductory Physics by Distance Learning"

- for high school students in physics
- from March to mid-May, 1998
- 10 weekly sessions, each 1 hour long
- classes start at 3 pm on Wednesdays
- 12 students, 6 notebook PCs (networked)
- homework, in-class exercises, no exams

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Course Logistics

Synchronous communications (in class)
- video and audio — ISDN (Intel Proshare)
- data — Internet (LearnLinc, WebCT)

Asynchronous communications
- bulletin board & electronic mail (WebCT)
- assignments — use Scientific Notebook
- paperless — all work submitted, graded and returned electronically

Equipment Setup

Course Delivery Tools

LearnLinc I-Net
- electronic hand raising
- text chat
- Q & A
- feedback polling
- applications sharing
- shared white board
- synchronized web browser
- library of course materials

WebCT
- bulletin board
- private mail
- chat room
- online quizzes/grading
- course notes
- course management (e.g., grades, student progress)

Activities in a Typical Session

in-class exercises
- qualitative questions
- analytic problems
- numerical calculations
- hands-on lab work
- computer simulations
- spreadsheet exercises

What is the trend?

- Shift toward Web-centric teaching/learning
- Fast adoption of distance-learning technologies by traditional universities
- Commercialization of "high-profit" courses and programs
- Proliferation of online course offerings (will reach a million in a few years!)

Outlook & Challenges
“2001: The Learning Odyssey”

No more pencils! No more books!

No more lectures! No more teacher's dirty looks!

Thank you!

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