Effective E-Learning
Using Learner-Centered Design

Tutorial Note Sampler for CHI 2003
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presented by:

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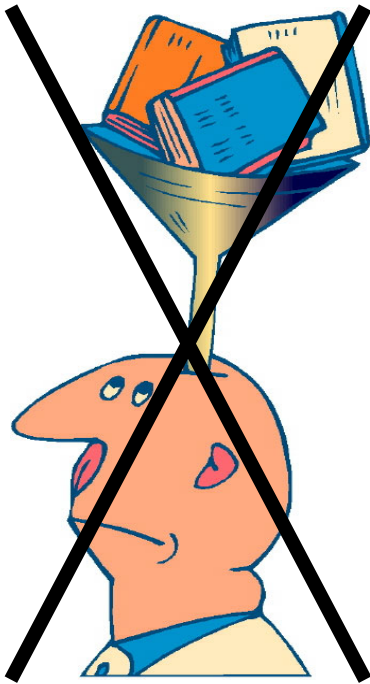Stanford, CA 94305
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Okay Mary...close the course window...
put the mouse down slowly...and back away
from the computer.

Objectives

E-Learning is not simply taking a binder of text materials and putting them on the Web. (Learning is not taking Web content and pouring it into your head!) Successful e-learning requires understanding learner needs, paying attention to research-based learner-centered design principles, and building an electronic environment that provides timely feedback, rich information, meaningful conversations, and learning-by-doing.

Let's take a different look at e-learning: that from a learner-centric viewpoint. In this tutorial, we will discover what capabilities and activities are needed to support rich, engaging learning. Together, we will learn about effective e-learning course designs and delivery modes, and review examples of current interfaces. We will critique existing designs and have an opportunity to create our own e-learning interface.

- Participate in individual and group activities to better understand how e-learning works
- Learn theories and models behind effective e-learning methodologies
- See a range of examples (both good and bad) of e-learning designs
- Learn to critically evaluate e-learning platform designs
- Review learner-centered design principles for e-earning
- Critique and review UI/UE designs
- Create your own e-learning design and receive group feedback

Agenda

9:00 am - 9:30 am	Section 1: 　Entering the Empty E-Room
9:30 am - 10:00 am	Section 2: 　Introduction and Overview
10:00 am - 10:30 am	Section 3: 　Gallery Walk Demonstration: 　　E-Learning platforms and UI analysis
10:00 am - 10:30 am	**Break**
11:00 am - 11:30 am	Section 4: 　Critical Analysis of E-Learning UI's
11:30 am -12:00 pm	Design Suggestions Morning Debrief
12:00 noon - 1:30 pm	**Lunch**
1:30 pm - 2:00 pm	Section 5: 　Learning Theories 101
2:00 pm - 3:00 pm	Section 6: 　The Design Activity
3:00 pm - 3:30 pm	**Break**
3:30 pm - 4:30 pm	Section 7: 　Design Walkthroughs
4:30 pm -5:00 pm	Design Awards Afternoon Debrief

Instructor Biographies
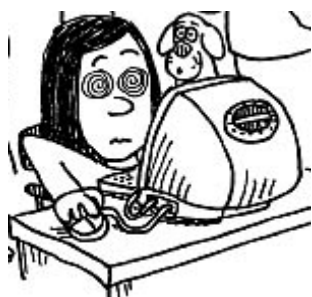
Sherry Hsi is the Director of New Media Research and Evaluation at The Exploratorium. She is also the founder and President of Metacourse, Inc., a company which provides e-learning consulting, course development, and online facilitator training to K-12, higher education, and non-profit learning organizations in English and Spanish.

Dr. Hsi has been designing online learning experiences since 1991. She was a post-doctoral scholar at The Concord Consortium and the NSF-funded Center for Innovative Learning Technologies. Her work there focused on designing interactive, collaborative learning environments using handhelds and Net-based technologies to support deeper inquiry, understanding, and assessment. Dr. Hsi also helped launch the first Virtual High School (www.govhs.org), providing expertise in online professional development of high school teachers, online faculty training, and mentoring.

Dr. Hsi is the co-author of the book *Computers, Teachers, Peers: Science Learning Partners* which articulates pragmatic design principles based on longitudinal studies of computer-based science learning. She is a graduate of the University of California at Berkeley, with degrees in Mechanical Engineering and Science Education.

Carolyn Gale is the Director of the Stanford Research Communication Program. Previously, Carolyn worked in various education technology research and evaluation positions, particularly in designing and evaluating online learning environments. Her past work in this area spanned a number of fields: US middle and high schools, community colleges, university engineering and management programs, and nonprofit organizations.

Carolyn holds degrees in Computer Science and Instructional Technology, both from Vanderbilt University. Her Masters thesis, *Factors that Affect Online Course Completion Rates,* found its way into Cliff Stoll's latest book, *High Tech Heretic*, and she has published articles about the online learner perspective. She also received honorable mention in the Microsoft Innovators in Higher Education Challenge for developing *Internet 101*, some of the first online tutorials and workshops on using Internet software.

2 Welcome to the Tutorial: Our Expectations, and an Overview of E-Learning

Let's review the day's activities:

- Our schedule for the day
- Review the definition and characteristics of e-learning
- Review different e-learning applications, platforms, and their interfaces
- Critique and Design Interfaces
- Journal Reflections

We strongly believe in learning by doing. Thus, keeping lectures to a minimum, we will be critiquing and evaluating, sketching, discussing, and reflecting upon issues in e-learning design.
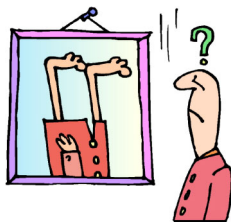
Using a Reflective Journal

Reflection upon one's learning is key to a full learning experience, whether online or in a notebook. Along the way, we'll provide space for you to jot down notes of what you have learned, and what questions you have.

Definitions of E-Learning

There are many flavors of e-learning, and it is easy to become boggled in the various definitions! Some examples include:

"Best practices for learning in the new economy, implying but not requiring benefits of networking and computers such as anywhere/anytime delivery, learning objects, and personalization. Learning on Internet time." – Jay Cross, Internet Time Group

"E-learning is mostly associated with activities involving computers and interactive networks simultaneously. The computer does not need to be the central element of the activity or provide learning content. However, the computer and the network must hold a significant involvement in the learning activity."— Tsai and Machado, eLearn magazine

Balancing the "E" with "Learning"

When e-learning occurs, we need a balance of the "E" and the "Learn". Too often, there is only emphasis on the "E" – here are some attributes of e-learning that includes the "Learn" side.

The E	The Learning
• Anytime, anywhere	• On-going monitoring of progress
• Content is delivered via a network	• Learning by doing with feedback
• Enables accountability of learning	• Repertoire of knowledge representations
• Connects participants with each other	• Repertoire of online activity structures
• Archive of each learner's work and interactions is kept	• Prompts, Hints, Guidance
• One-to-many	• Human intervention
	• Incentives/motivation aligned with individual and organization

Learner-Centered Design

(adapted from Hsi, Solloway workshop on LCD:
http://www.acm.org/sigchi/bulletin/1998.4/hsi.html)

Designers of learning-support software are finding that user-centered design (UCD) principles and approaches they were trained to employ fall short in addressing many design issues that are common in learning situations. How should designers create interfaces to support robust understanding of subject matter knowledge, construction of new knowledge, and higher-order thinking skills, while also improve lifelong inquiry?

Traditional UCD task analytic methodologies (e.g., GOMS analysis) work well when a task or domain is well-specified. In the case of learning, goals not only differ across learners (both students and teachers) who have different intentions, but also across content domains and pedagogical approaches. Learner-centered system design recognizes that users have changing needs and abilities and user interfaces need to support these changes in the process.

Learners often need more guidance or "learning scaffolds" at the beginning of instruction, but these supports need to change interactively and "fade" as the learner builds competencies and new expertise. LCD recognizes the need to balance the amount of help provided to users while encouraging users to become more independent in their learning.

LCD also recognizes the diversity of learners and teaching styles: topics and problems need to be selected to promote interest in the task at hand, and motivate further inquiry independent of the technology.

The first step in learner-centric is to understand how learning takes place. Much modern research in cognitive science shows that people learn by doing. So it is very important that people learn not by reading a book, and not by listening to a lecture, but by doing tasks that can engage the mind.

- Don Norman, *eLearningpost* **interview**

Course Expectations, and Our Expectations of You

Well-designed online courses provide clear expectations for participation, communication, attendance, and a rubric for quality course contributions. This is an example of one online instructor's way of making expectations explicit:

<available in full tutorial notes>

No

Yes!

Now that you've seen an example…

What are our expectations of you during this tutorial?

- Even though this is a tutorial, don't think you can hide in a corner or sit passively! Bring your ideas, stories, and designs to the table.

- Learning is a joint enterprise with joint responsibilities. Ask questions early and often. Share answers too if you have them.

- Try to work in a collaborative group even if your tendency is to work alone.

- Make your thinking explicit: sketch, document, write, reflect, and share ideas.

3 A Gallery Walk: Current E-Learning Platforms and User Interfaces

There are many kinds of e-learning platforms and tools available that vary in their flexibility to customize a learner interface. Let's take a gallery walk and review three categories of e-course design tools: Course Management Systems, Open Source Development Tools, and Discussion Tools.

While we display features of the various platforms, keep in mind the following:
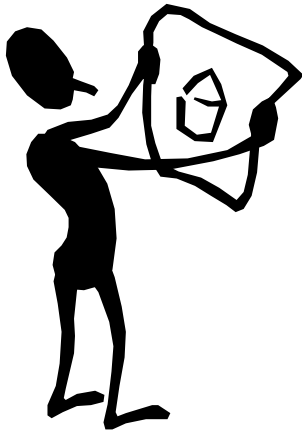
- How does it support on-going monitoring of progress?
- Is there learning by doing with feedback?
- Is there a repertoire of knowledge representations in the media?
- Is there a repertoire of online activity structures
- Where are prompts, hints, or guidance? What kind of scaffolding is provided?
- Where can you find human-to-human interactions?

Refer to your handout for more detailed examples. We'll step through most of these systems, as time permits.

I. Course Management Systems

These are e-learning platforms offered at the enterprise level that provide both a way to design, host, and deliver online courses via the Internet. Many of these systems originated from universities and were designed to support university teaching and tend to be instructor-centric. Designed for instructors who need Web-based content to support their face-to-face courses and fully online instructors, these systems allow posting of lecture materials, online bulletin boards, and assessment capabilities like online surveys and tests.

Blackboard

www.blackboard.com

Blackboard is a popular course management system which allows instructors to author in text or HTML lessons. Features include online lectures, rosters, live whiteboard, asynchronous bulletin board, document sharing, and assessment pools. Other similar alternatives include WebCT, eCollege, and LearningSpace.

FirstClass

www.centrinity.com

FirstClass is messaging, collaboration groupware, and communication system which supports online bulletin boards, calendaring, and document sharing. Instructors often using FirstClass's messaging system to develop an online course.

II. Open Source
Course Development Environments

Because enterprise level course development systems are often difficult to customize or change at a user interface level, and can be expensive to license, there are open source alternatives that range in the amount of programming experience needed to install and operate.

Electronic Educational Environment

eee.uci.edu

This is a set of tools developed at the University of California, Irvine, built upon SQL.

Ybos

www.ybos.net

Built upon the Arsdigita community system, this open source tool allows database-backed web sites, custom courses and communities to be developed. Using Ybos starter tools, one can create an e-learning experience quickly.

Zope

www.zope.org

This is growing community of users and a generic open source programming environment for creating online education applications.

> **… although I'm very critical … of most current e-learning … I don't think the designers were necessarily incompetent. They were simply imitating the commonly accepted notion of what education looks like – which does not involve the way people really learn. People really learn by doing a task they care about, failing, and redoing it until they get it right.**
>
> **- Roger Schank,**
> ***Designing World-Class E-Learning***