Designing for Learning

http://www.sjul.org/learning03

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TOPIC

Learning is essential to life as we know it. The rate of social and technological change has increased to a point where an individual must constantly acquire new skills and knowledge in order to maintain their place in society. Once, an apprenticeship served before age 14 offered sufficient learning to last a lifetime. Today, society presumes 12 years of schooling in general knowledge, followed by 4-12 years of specialized education or on-the-job apprenticeship. Much of the knowledge acquired is often obsolete even before this education is complete.

Fortunately, the computing technology that is a driving force behind these social changes offers a means of meeting the very need it creates. User interfaces and technologies can be designed to promote "deep learning" —learning that goes beyond knowing how to use the tool to understanding the concepts and skills necessary to do the task. However, even for designers of learning technologies, design for learning is, in many ways, still a non-systematic "craft." For designers of general technologies, design for deep learning is largely a black art.

Researchers and designers in other communities have explored issues surrounding learning and computational tools for learning and teaching. However, these other communities focus primarily on psychological theories of learning [1, 5, 6, 7] or support for educators and specific educational settings [2, 3, 4]. The focus of this workshop, in contrast, is on the needs of design and designers.

OVERVIEW

This two-day workshop is aimed at providing designers with a richer framework for the design of user interfaces that promote learning that is applicable to a variety of design settings and learning contexts. The focus of the workshop is on the issues raised by considering learning as a problem in design rather than a problem in psychology or education. The goal for the workshop is to provide a conceptual foundation for characterizing different types of learning challenges, understanding the implications of different learning challenges for design, and developing principles for design to meet those challenges in a variety of design situations. The 16 workshop participants will be selected with a view to creating a diversity of perspectives and backgrounds to ensure that a broad spectrum of learning and design situations are considered.

Specific questions and issues for discussion include:

- *Learning challenges posed by different learning outcomes or contexts.* From a learning perspective, what are the similarities and differences between, for example, students learning science process and content in a classroom setting, shoppers learning to use a new automatic checkout scanner at the supermarket, and internet users learning better search strategies?

- *Design challenges posed by meeting different learning challenges.* From a design-for-learning perspective, what are the similarities and differences between designs for meeting these different challenges in different design settings and learning contexts? For example, what might designs to help students understand information search strategies have in common with an interface designed to allow an internet user do so in the course of completing a search task?

- *Design elements and examples.* What specific elements can be designed and implemented to meet different learning challenges? For example, how can multiple views and multiple representations be used to support concept formation and categorization? What other design techniques might be used?

- *Professional issues.* From different professional perspectives, e.g., research, education, design practice, what professional issues do these questions raise? What recommendations can be made to different professions with respect to designing for learning?

The workshop is organized around a design contest aimed at providing a tangible context for discussing and answering these and other important questions. The anticipated outcome of the design contest is a set of design mockups or prototypes that CHI attendees may review and comment upon during the CHI poster sessions. These designs will be presented in conjunction with a workshop poster describing the more theoretical results produced by the workshop.

FORMAT

Each participant will be assigned to a design team and a birds-of-a-feather (BOF) group. Each design team will be composed of 3-5 individuals with different professional perspectives and interests, e.g., research, education, design. These teams are charged with developing prototypes or mockups as part of the design competition. They will also be expected to report on issues encountered and insights gained while doing so. BOF groups, in contrast, are composed of individuals with shared professional interests and perspectives. They are charged with providing specialized views on the issues raised and provide an opportunity for participants to engage in more detailed professional discussion. Participants will be invited to join particular design teams and BOF groups based on their expressed interests.

DESIGN EXERCISE

Each design team will be asked to design a specific technology to help users negotiate the Copenhagen (Denmark) metro area transit system (http://www.dsb.dk/stog). Among the challenges posed by this system is a complex (some would say, insidious) system of ticketing. Each design team will be assigned to one of three design scenarios. The desired learning outcome (understanding the ticketing system) is the same in all scenarios, in order to provide common ground for discussion. However, each scenario embeds that learning in a different design and learning context.

Design Challenge

Learning Outcome

The learner should come to understand the zone-pricing system used by the Copenhagen metro area transit system. Note that the actual learner may differ from the user for whom the design is intended. You must design for the intended user, but keep the learning needs of the actual learner in mind.

Design Scenarios

1. Educational Setting (Mr. Kobalevsky)

The design team is designing instructional materials about Copenhagen, focusing on the transit system unit.

Intended user	Mr. Kobalevsky's 9th grade class from Wap Wap, Michigan who will be going to Copenhagen on a class trip. There is no public transit system in Wap Wap and the students may not have prior experience with ticketing for such, e.g., distance-dependent pricing, time-dependent tickets, multiple trip discounts.
Actual learner	Same as intended user.

2. Instruction-less Setting (Ms. Thibodeaux)

The design team is designing a web page for the official site explaining ticket purchase and use.

Intended user	Residents and visitors of Copenhagen making their travel plans.
Actual learner	Ms. Thibodeaux, a city planning consultant hired by the city of Wap Wap, Michigan, to develop a design for the pricing system for their new public transit system. Ms. Thibodeaux is using the Copenhagen web site to understand Copenhagen's pricing system.

3. Incidental Setting (Ali)

The design team is designing a web page for the official site explaining ticket purchase and use.

Intended user	Residents and visitors of Copenhagen.
Actual learner	Ali Mahmoud, the mayor of Wap Wap, Michigan who is in Copenhagen for a conference on "Sustaining Multi-National Communities." Ali will be in the Copenhagen area for a week and will be traveling about the city. However, the Wap Wap city budget requires that she keep expenses to a minimum, so she will be using the public transit system.

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