Wisdom is not the product of schooling but the lifelong attempt to acquire it.  
- Albert Einstein

Design, Learning and Collaboration

Gerhard Fischer and Leysia Palen
Spring Semester 1999

Introduction and Overview of Course, Jan 11, 1999
Intersection of Design, Learning and Collaboration and their Changing Nature through New Media
The Tension between Human and Computational Power

The power of the unaided individual human mind remains constant over time.

Computing power increases at an exponential rate.

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The power of the unaided individual human mind remains constant over time.
The Collective Human Mind — Exploiting the Social Power of Collective Human Minds, Aided by Technology

2500 BC  1500  1980  1998
Reading & Writing  Printing Press  Computers  Social Impact
Design

- **design** = although there is a huge diversity among design disciplines, we can find common concerns and principles that are applicable to the design of any object, whether it is a (scientific, mathematical) notation / poster, a household appliance, a housing development, a software system, ........

- **some relevant publications:**
  
  
  
Learning

- **learning** = is a new form of labor and working is often a collaborative effort among colleagues and peers. In the emerging knowledge society, an educated person will be someone who is willing to consider learning as a lifelong process. More and more knowledge, especially advanced knowledge, is acquired well past the age of formal schooling, and in many situations through educational processes that do not center on the traditional school.

- **some relevant publications:**
Collaboration

collaboration = the individual, unaided human mind is limited: there is only so much we can remember and there is only so much we can learn.

• some relevant publications:
    http://www-l3d.cs.colorado.edu/~l3d/courses/CSCI7782-3-S98/
Innovative System Developments in L3D

http://www-l3d.cs.colorado.edu/~l3d/

- **Domain-Oriented Design Environments**
  - kitchen design, computer network design, voice dialog design, ..... 

- **Dynasite**
  - WWW support for collaborative design
  - Sources, Dynagloss, ....

- **Agentsheets, Visual AgenTalk, Behavior Exchange**
  - substrate for domain-oriented design environments
  - simulation, end-user programming
  - sharing the work

- **Envisionment and Discovery Laboratory**
  - integrated physical and computational environments
  - creating shared understanding
  - studying authentic problems
Fundamental Difference between Printed and Computational Media

**print media:** a fixed context is decided at design time

**computational media:** decision at use time can take advantage of contextual factors only known at use time (e.g., dynamic forms, dynamic websites, ......)

**challenge:** articulation of contextual factors at use time (about tasks, users, social systems,......) — end-user programming, specification sheets, usage data, ......
Self-Application: A “New Culture” for this Course

• “asymmetry of knowledge” or a “symmetry of ignorance” — stakeholders are aware that while they each possess relevant knowledge, none of them has all the relevant knowledge

• teacher, learner = f{person} ===> teacher, learner = f{context}

• the knowledge for (re)solving complex, real-world problems does not exist a priori, but is generated through collaboration among stakeholders
Informed Participation for a New Civic Discourse in the Information Age

• “knowing in action”
  - knowledge is acquired by interacting with the world and people
  - a merge between being informed and participating in the world because
    * we cannot really be informed unless we participate
    * we cannot really participate unless we are informed

• design principles:
  - from consumer to designers
  - from closed to open systems
  - honor and support emergent behavior
  - underdesign systems
Integration of Theories, System Development, Practice and Evaluation

Theories

System Development

Evaluation

Practice