Center for LifeLong Learning & Design

University of Colorado at Boulder

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

Transdisciplinary Graduate Education

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Course information environment (SWIKI):
http://l3dswiki.cs.colorado.edu:3232/phd-intro

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Lifelong Learning and Graduate Education

- **basic assumption:**
  - If the world of working and living relies on collaboration, creativity, definition and framing of problems, dealing with uncertainty, change, and distributed cognition
  - then graduate education needs to prepare students for having meaningful and productive lives in such a world

- **graduate education should**
  - help learners enhance their ability to learn, engage in meaningful activities, and exploit the power of media
  - promote new civic discourses, since a major role for new technologies is not to deliver predigested information but to provide for social debate and discussion
  - advance knowledge and mindsets about communities of diverse learners
  - focus on transdisciplinarity

Transformations in Graduate Education

- information technology revolution

- globalization (e.g.: Friedman, T. L. (2005) *The World is Flat: A brief history of the twenty-first century,* Farrar, Straus and Giroux, New York.)

- increasing trends to outsource and offshore high-level cognitive tasks → see class meeting on October 25, 2006

- participate effectively in diverse collaborative organizations addressing complex world problems

- collaboration with experts from multiple fields and interact and work with people of diverse backgrounds

Transdisciplinary

- mono, multi, and interdisciplinary approaches each generate new knowledge

- multi- and interdisciplinary approaches overflow the boundaries between distinct disciplines

- transdisciplinary takes us beyond disciplines by weaving a new kind of knowledge

- transdisciplinary competencies refer to knowledge and skills required to identify, frame and address important scientific and practical problems that cut across disciplinary boundaries

- engaging in transdisciplinary collaboration → not only the intersection of two existing fields is explored, but the participating fields themselves undergo changes

New Media and Socio-Technical Design

- working, learning, collaborating, designing never was and never will be independent of media

- rethink the power of new media as a co-evolutionary process: beyond **"gift-wrapping" and "technology-driven developments"**

Co-Evolution

Beyond "Technology-Driven Developments" and "Gift-Wrapping"
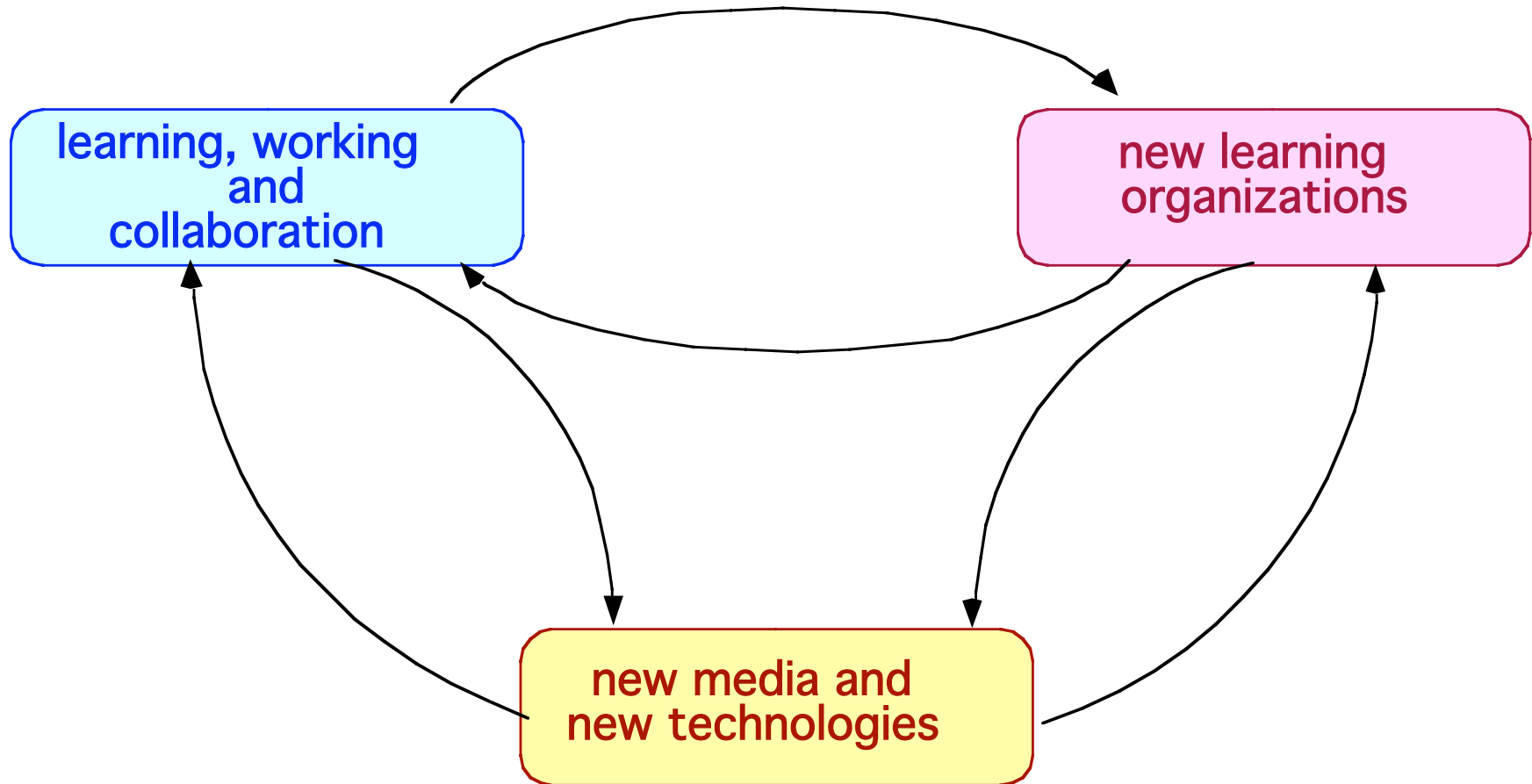
From Reflective Practitioners to Reflective Communities

- supporting reflective practitioners is important, but it is **not enough** because complex design problems require more knowledge than any single person possesses and the knowledge relevant to a problem is distributed

- evidence that individual, disciplinary competence is limited:
  - "even within disciplines, disciplinary competence is not achieved in individual minds, but as a collective achievement made possible by the overlap of narrow specialties" [Campbell, 1969] ;
  - "while the Western belief in individualism romanticizes this perception of the solitary creative process, the reality is that scientific and artistic forms emerge from the joint thinking, passionate conversations, emotional connections, and shared struggles common in meaningful relationships" [John-Steiner, 2000];
  - "nobody knows who the last Renaissance man really was, but sometime after Leonardo da Vinci it became impossible to learn enough about all the arts and the sciences to be an expert in more than a small fraction of them" [Csikszentmihalyi, 1996];
  - "none of us is as smart as all of us" [Bennis & Biederman, 1997];
  - "Linux was the first project to make a conscious and successful effort to use the entire world as a talent pool" [Raymond & Young, 2001].
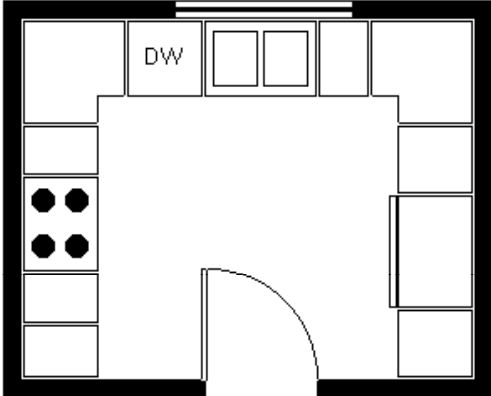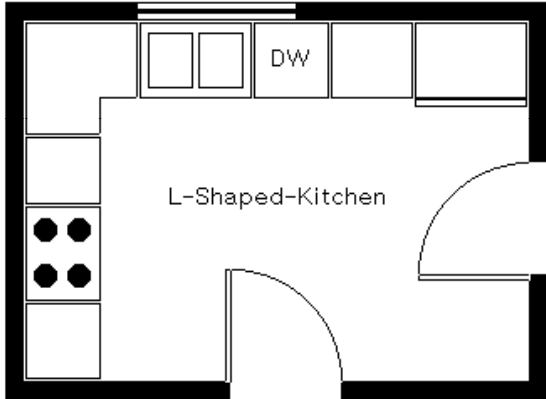
Communities of Practice and Communities of Interest

- ***Communities of Practice*** = groups of people who share a professional practice and a professional interest

- ***Communities of Interest*** = groups of people (typically coming from different disciplines) who share a common interest, such as framing and solving problems and designs artifacts

Communities of Practice (CoPs): Homogenous Design Communities

- **characterization:** reflective practitioners who work as a community in a certain domain

- **examples:** kitchen designers, STEM teachers, architects, urban planners, software developers, software users, ……

- **learning:**
  - masters and apprentices
  - **legitimate peripheral participation (LPP)** → one accepted, well-established center and a clear path of learning towards this center

- **problems:** avoiding **group-think** (when people work together too closely in communities, they sometimes suffer illusions of righteousness and invincibility)

- **systems: domain-oriented design environments**

# A Domain-Oriented Design Environment for Kitchen Design: Construction

Communities of Interest (CoIs): Heterogeneous Design Communities

- **characterization =** bring different CoPs together based on a shared interest in the framing and resolution of a major design problem

- **examples:** large scale software developments projects, transportation planning, digital fluency, reinventing universities as learning organizations, improving the life of people with disabilities

- **learning:**
    - exploiting the symmetry of ignorance
    - building bridges between diverse cultures
    - transdisciplinary education

- **problems and challenges:** establishing common ground, creating boundary objects, mutual appreciation
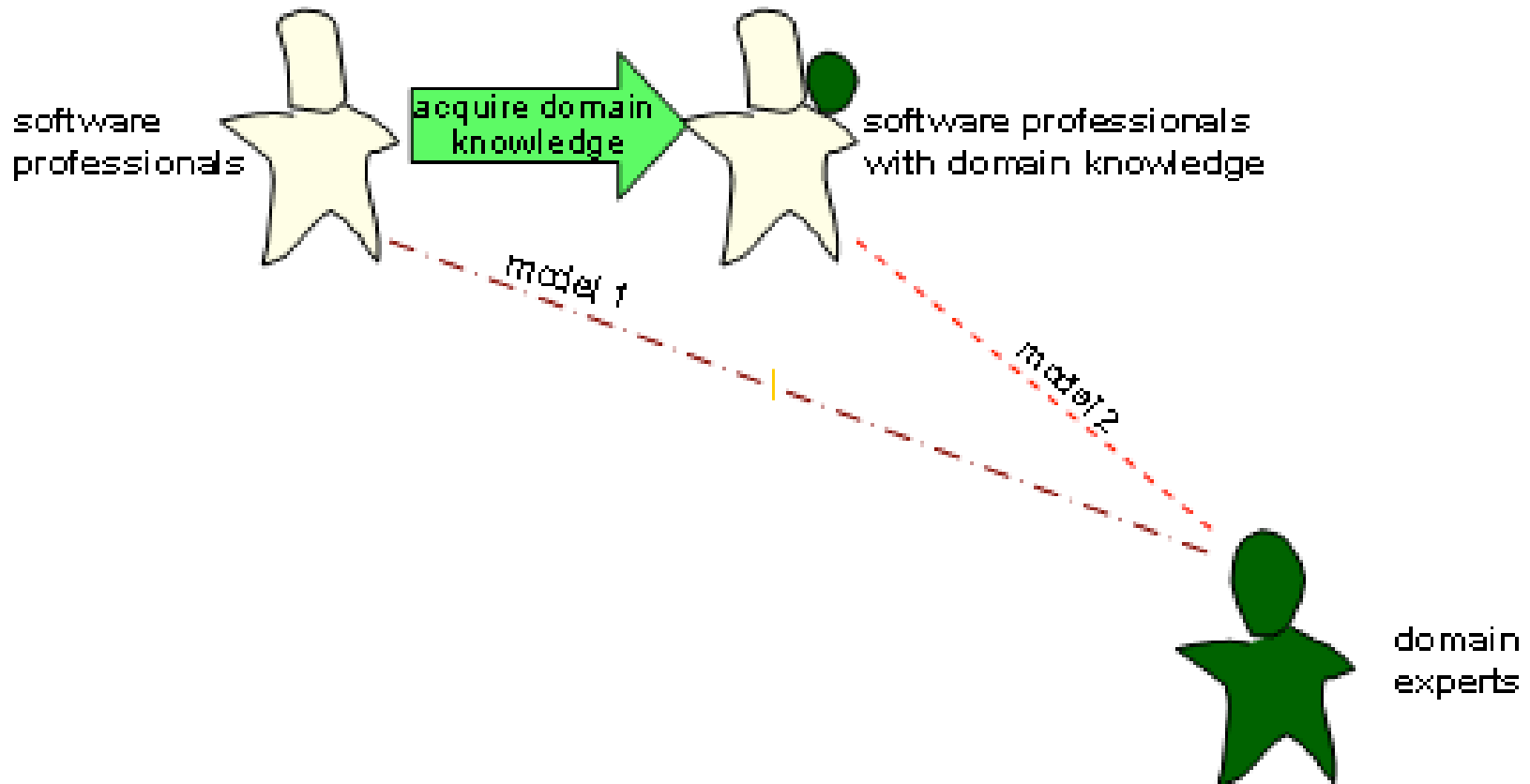
- **systems: Envisionment and Discovery Collaboratory**
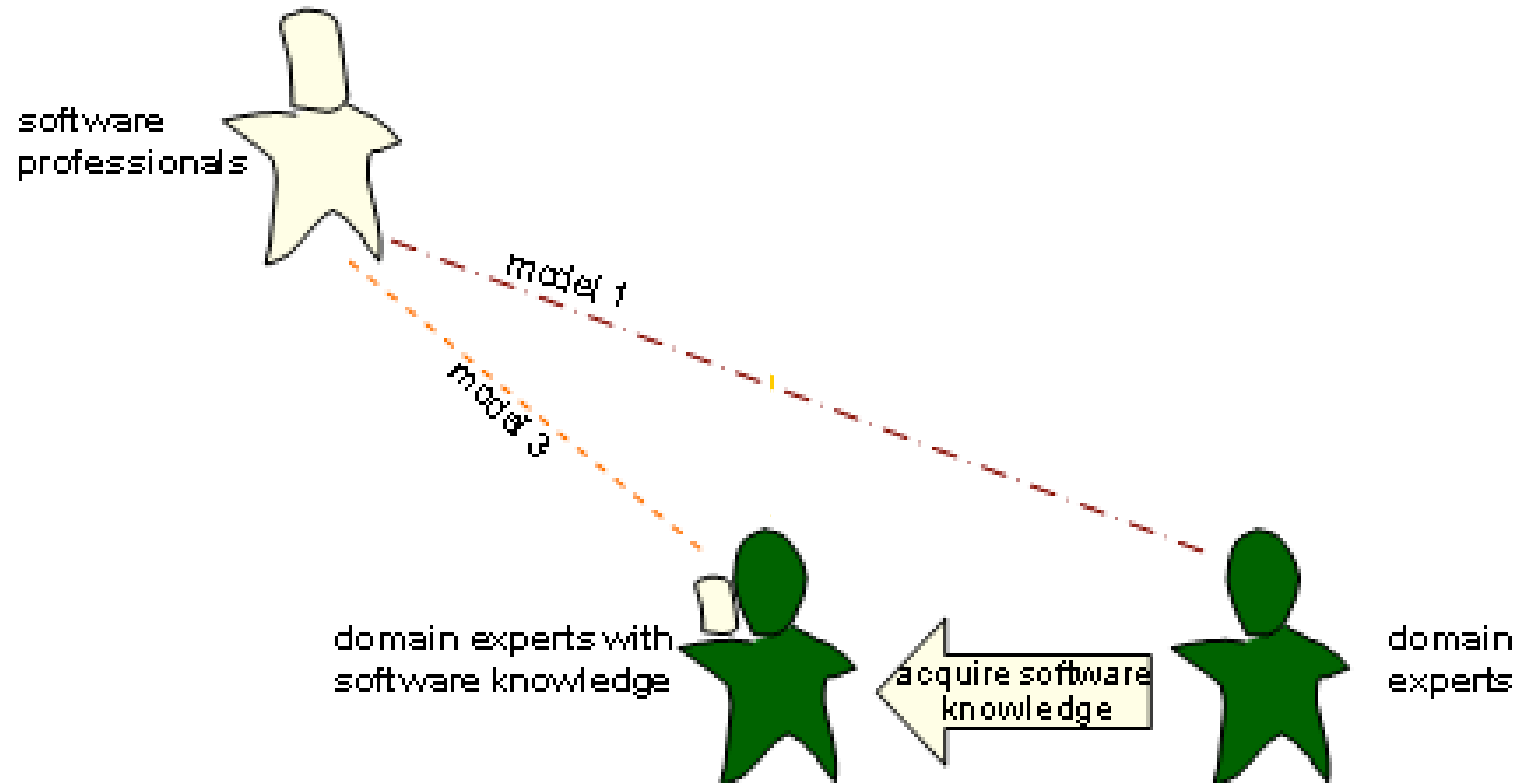
The Envisionment and Discovery Collaboratory

Large Conceptual Distance — Limited Common Ground

software
professionals

model 1
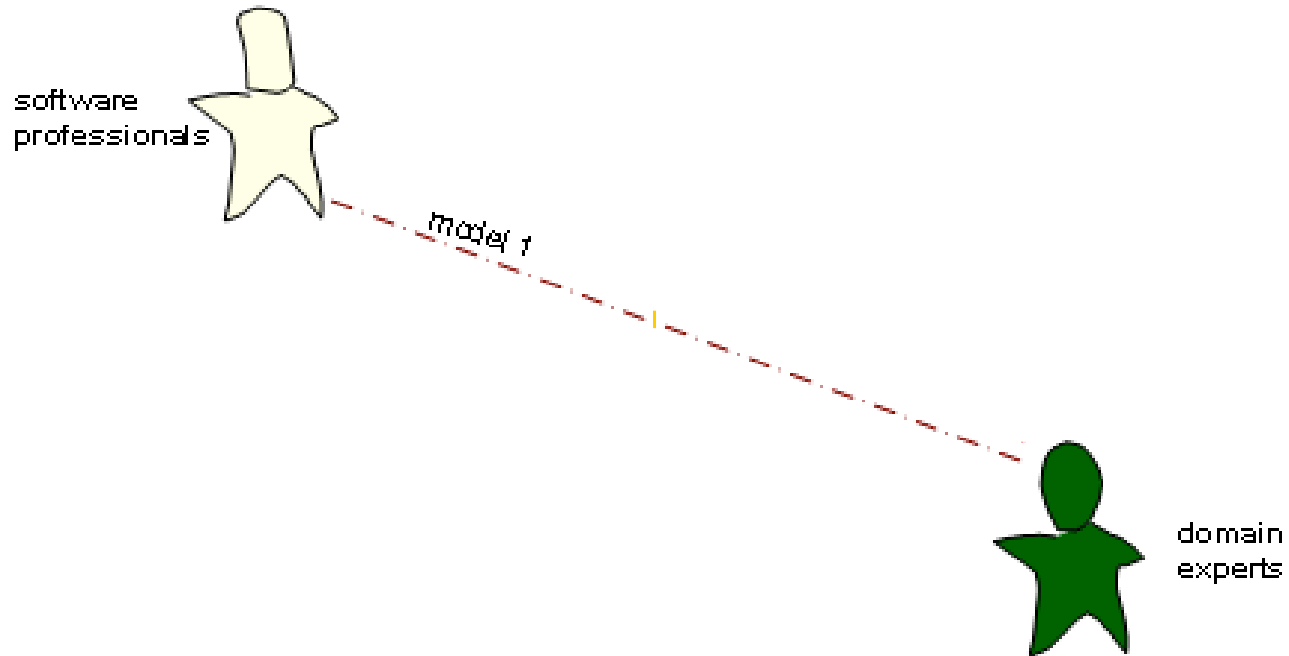
domain
experts

Software Professionals Acquiring Domain Knowledge

software professionals

acquire domain knowledge

software professionals with domain knowledge

model 1

model 2

domain experts

Domain Experts Acquiring Media Knowledge

software professionals

model 1

model 2

domain experts with software knowledge

acquire software knowledge

domain experts

Reflective Communities and Transdisciplinary Graduate Education