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

Lifelong Learning: Changing Mindsets

Gerhard Fischer, Hal Eden, Hiroaki Ogata, and Eric Scharff
DLC Course, Spring Semester 2002
February 20, 2002

Problems in the Information Age

- lack of creativity and innovation
- coping with change
- school-to-work transition is insufficiently supported
- the “gift wrapping” approach dominates educational reform
LifeLong Learning

- **more than “adult education”** → it tries to cover and unify all phases: intuitive learner (home), scholastic learner (school and university), skilled domain worker (workplace)

- **learning is a new form of labor** → integration of learning, working (teaching) and collaborating

- **changes** required from a lifelong learning perspective for **computational media**:
  - from means → ends
  - from medium → content
  - from computers → tasks, services
  - from specialist → every-day life
  - from “learning about computers” → “learning with computers”

- **to make lifelong learning an important part of human life**
  - new intellectual spaces, physical spaces, organizational forms, and reward structures need to be created
  - allowing individuals, groups, and organizations to personally engage in and experience these new forms as risk takers who use their creativity and imagination to explore alternative ways of learning
Co-Evolution: Beyond “Technology-Driven Developments” and “Gift-Wrapping”
“Technology-Driven Developments”

\[ \text{Education} = f\{\text{Media, Technology}\} \leftrightarrow \text{Media, Technology} = f\{\text{Education}\} \]
“Gift-Wrapping” and Beyond

• **claim:**
  - “**old**” frameworks such as instructionism, fixed curriculum, memorization, decontextualized learning, ..... do not get changed by technology itself (e.g., intelligent tutoring systems, expert systems, multimedia, networks)
  - “**new**” frameworks: lifelong learning, integration of working and learning, learning on demand, problem-based learning, authentic problems, self-directed learning, (intrinsic) motivation, collaborative learning, organizational learning, “open source” approaches, ......

• **Peter Drucker:** “There is nothing so useless as doing efficiently that which should not be done at all.”

• **beyond a consumer mindset**  ➔ new civic discourses are required, because one of the major roles for new media and new technologies is not to deliver predigested information to individuals, but to provide the opportunity and resources for social debate and discussion
**Different Conceptualizations of School and **Lifelong Learning**

<table>
<thead>
<tr>
<th><strong>School/University</strong></th>
<th><strong>Lifelong Learning</strong></th>
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<tbody>
<tr>
<td>emphasis</td>
<td>“basic” skills; exposure; access</td>
</tr>
<tr>
<td>potential drawbacks</td>
<td>decontextualized, not situated</td>
</tr>
<tr>
<td>problems</td>
<td>given</td>
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<tr>
<td>new topics</td>
<td>defined by curricula</td>
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<tr>
<td>structure</td>
<td>pedagogic or “logical” structure</td>
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<tr>
<td>roles</td>
<td>expert-novice model</td>
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<tr>
<td>teachers / coaches</td>
<td>expound subject matter</td>
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<tr>
<td>mode</td>
<td>instructionism (knowledge absorption)</td>
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# New Forms of Learning of Importance to Lifelong Learning

<table>
<thead>
<tr>
<th>Form</th>
<th>Complementing Form</th>
<th>Contribution toward Mindset Creation</th>
<th>Major Challenges</th>
<th>Media Requirements</th>
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<tr>
<td>self-directed learning</td>
<td>prescribed learning</td>
<td>authentic problems</td>
<td>problem framing</td>
<td>understanding evolving tasks</td>
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<tr>
<td>learning on demand</td>
<td>learning in advance</td>
<td>coverage is impossible; obsolescence is guaranteed</td>
<td>identifying breakdowns; integration of working and learning</td>
<td>critics; supporting reflection-in-action</td>
</tr>
<tr>
<td>informal learning</td>
<td>formal learning</td>
<td>learning by being in the world</td>
<td>larger, purposive activities provide learning opportunities</td>
<td>end-user modifiability</td>
</tr>
<tr>
<td>collaborative and organizational learning</td>
<td>individual learning</td>
<td>the individual human mind is limited</td>
<td>shared understanding; exploiting the “symmetry of ignorance” as a source of power</td>
<td>externalizations understandable by all stakeholders</td>
</tr>
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Mindset Issues

• **mind-set → definition:**
  - a mental attitude or inclination
  - a fixed state of mind

• **the “big switch” theory? → “school-to-work” transition:**
  if the world of working and living relies on collaboration, creativity, definition and framing of problems, dealing with uncertainty, change, distributed cognition, symmetry of ignorance, ...... → *then the world of schools and universities need to prepare students to be able to have a meaningful life in this world*

• **"passion schools"**
  - students are placed in curricula based on their interests, rather than the grade they are in
  - students would be encouraged to stick with a particular curriculum for a long time, perhaps several years, while they develop deep skills and understanding

• **new assessment approaches for design-based education**
  - motivation (intrinsic ↔ extrinsic)
  - interest
  - participation in communities of learners
  - long-term longitudinal assessment
Practice — A Video Illustrating Opportunities to Create New Mindsets

• classrooms as design studios (video)
  - a design environment for a programmable brick → for details see: http://www.legomindstorms.com/
  - children in the classroom → design studio of tomorrow
  - programming the brick
  - getting the mother involved
  - learning by designing and by being articulate about it

• mindsets of “teachers”
  - lifelong learners
  - working shops
  - virtual libraries
Assessment: Understanding the Mindsets of Students — Feedback from Students Taking one of Our Courses

**a negative comment**: “I will not ever take a course of this nature again in my undergraduate career, and I hope to find a more structured graduate program with an adviser that is more forthcoming. I will reinforce my strengths by continuing to study in the method that I have developed over the past 15 years. I will redirect my weaknesses by avoiding unstructured class environments.”

**a positive comment**: “When I signed up for this class I had no idea what it was going to be about. Once I started understanding the material, however, I was extremely thrilled and interested to be a part of one of the most progressive courses on campus. I'm not sure what specifically to say except that I rank this class in the top three that I've taken at CU. The self-directed nature of the work ensured that I wouldn't be bored or unchallenged, and the interplay between all of us was a lot of fun. After four and a half years in college, I can honestly say that this is one of the first courses where I was treated as an adult, a fact which means more to me than I can describe.”
## Mismatches

<table>
<thead>
<tr>
<th>Teacher</th>
<th>Student</th>
<th>Example</th>
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<tbody>
<tr>
<td>authority (&quot;sage on the stage&quot;)</td>
<td>dependent, passive</td>
<td>lecture without questions, drill</td>
</tr>
<tr>
<td>motivator and facilitator</td>
<td>interested</td>
<td>lecture with questions, guided discussion</td>
</tr>
<tr>
<td>delegator</td>
<td>involved</td>
<td>group projects, seminar</td>
</tr>
<tr>
<td>coach/critic (&quot;guide on the side&quot;)</td>
<td>self-directed, discovery-oriented</td>
<td>self-directed study group, apprenticeship, dissertation</td>
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What Are Students Used To?

- consumers of education

- teacher, learner = f{ person} → teacher, learner = f{context}

- students believe that problems have an answer and that the teacher has to know the answer

- unwilling to engage in peer-to-peer learning (no surprise in a culture in which collaboration is mostly treated as “cheating”)

- learn to get good grades → learning based on interest, passion, enjoyment, intrinsic motivation

- assessment by teachers → self-assessment
Open Source and Open Systems
—
An Intellectual Paradigm Requiring a New Mindset:
From Users/Consumers → Co-Developers/Designers

• Educational Object Economy
  - Java objects designed specifically for teachers and developers interested in producing educational software
  - http://www.eoe.org

• Educational Software Components of Tomorrow (ESCOT)
  - digital libraries of sharable educational software (SRI International)
  - http://www.escot.org

• Open Source → Open Systems
  - collaborative development of software (e.g., Linux operating system)
  - http://www.tuxedo.org/~esr/writings/
Challenges

“If you think education is expensive, try ignorance!”

- **costs ↔ quality**: role and value of “residential, research-based universities” in the global, educational market of the future

- **from consumers to designers**
  - Illich (in *Deschooling Society*): “*schools and universities = reproductive organ of a consumer society*”
  - technical challenges (open systems, end-user computing) and social challenge (change mindsets and cultures)

- **“basic” skills**: if most job-relevant knowledge must be learned on demand → what is the role of “basic” skills?

- **“school-to-work” transition**