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
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paper: Fischer, G: "Lifelong Learning: Changing Mindsets", Proceedings of ICCE 99, 7th International Conference on Computers in Education on "New Human Abilities for the Networked Society", November 4-7, 1999, Chiba, Japan. pp. 21 - 30.

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

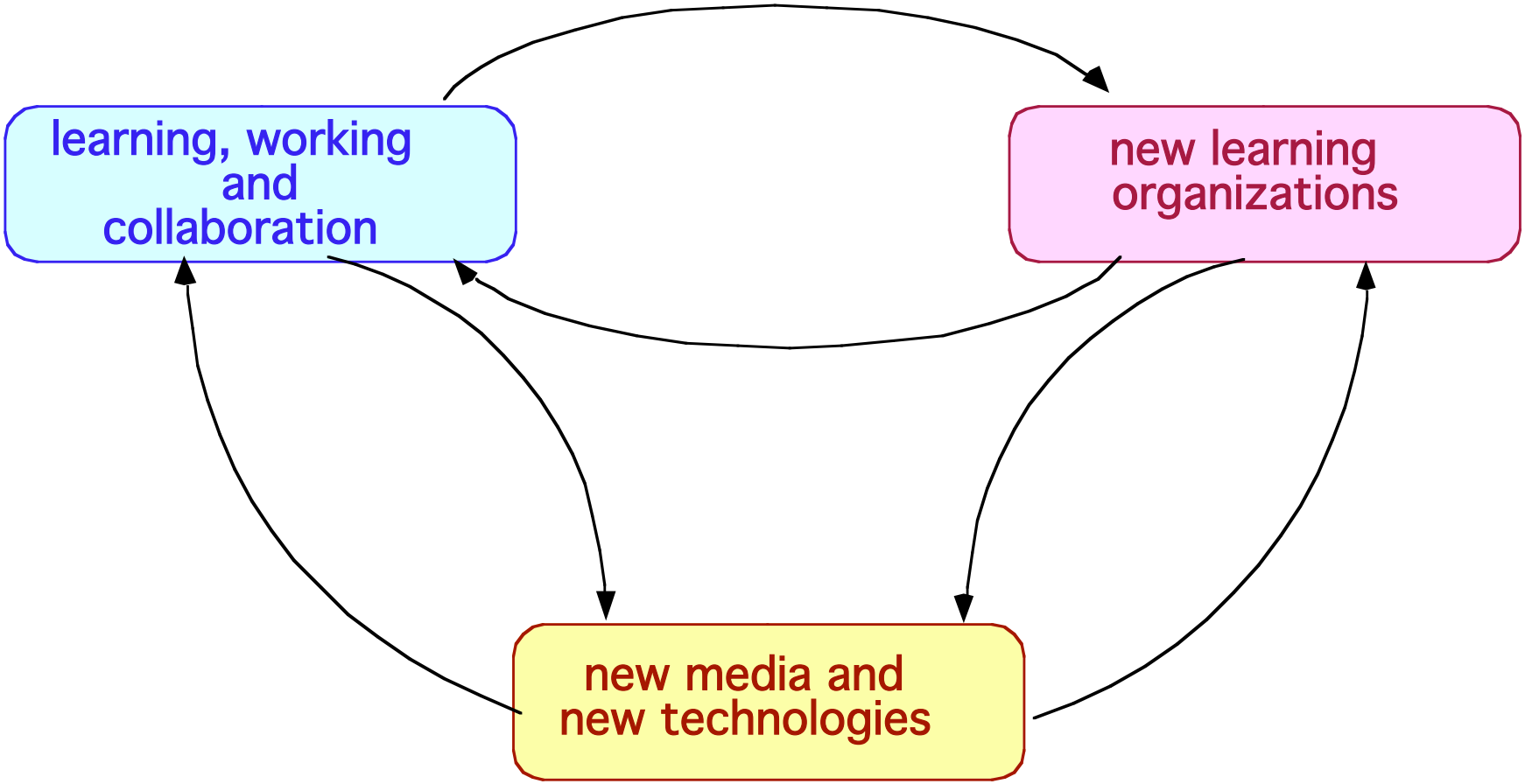
- **more than "adult education"** → it tries to cover and unify all phases: intuitive learner (home), scholastic learner (school and university), skilled domain worker (workplace)

- **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"

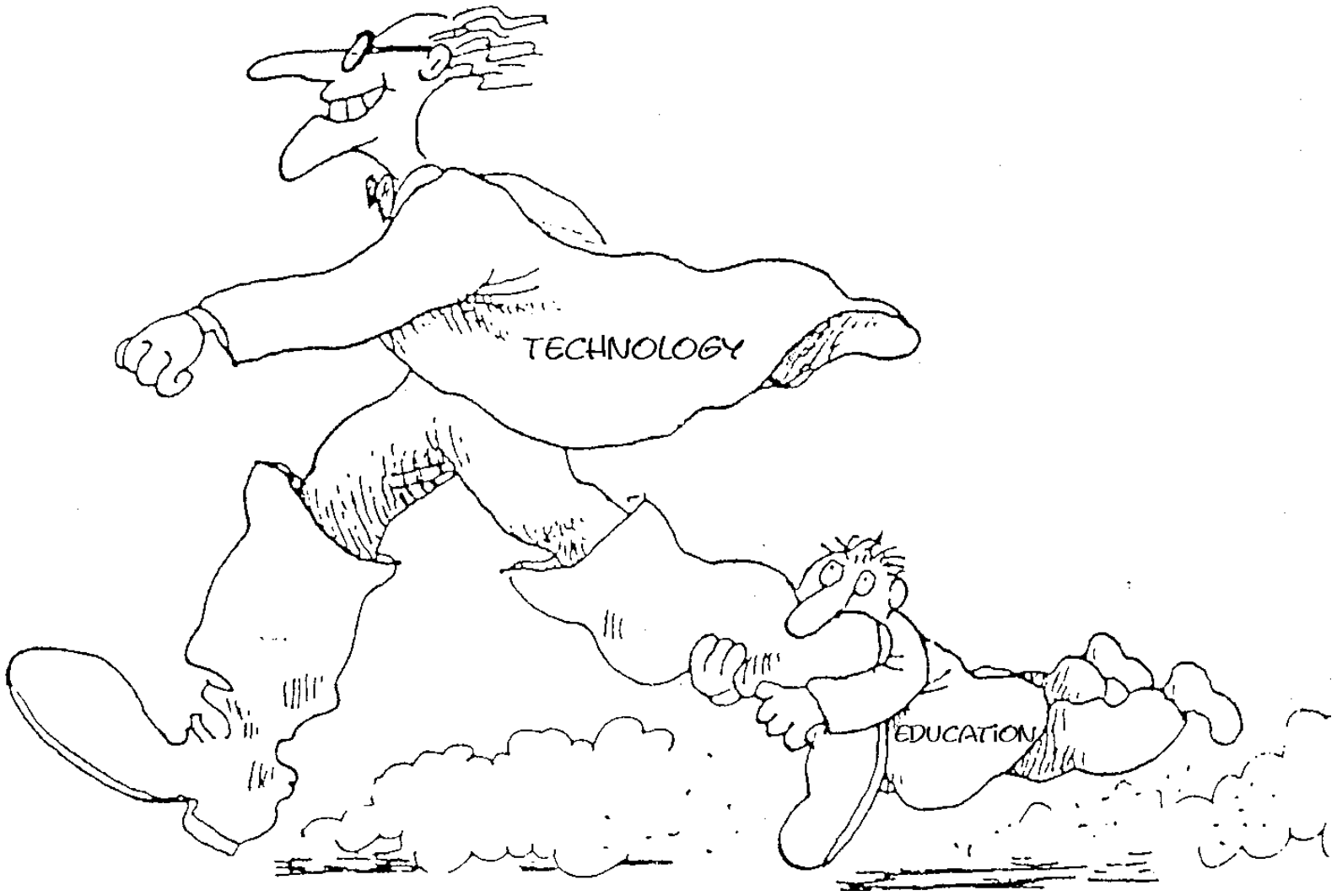
- **to make lifelong learning an important part of human life**
  - new intellectual spaces, physical spaces, organizational forms, and reward structures need to be created
  - allowing individuals, groups, and organizations to personally engage in and
  - experience these new forms as risk takers who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

Co-Evolution: Beyond "Technology-Driven Developments" and "Gift-Wrapping"



"Technology-Driven Developments"

Education = f{Media, Technology}←→Media,Technology = f{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

	School/University	Lifelong Learning
emphasis	"basic" skills; exposure; access	education embedded in ongoing work activities; informed participation
potential drawbacks	decontextualized, not situated	important concepts are not encountered
problems	given	constructed
new topics	defined by curricula	arise incidentally from work situations
structure	pedagogic or "logical" structure	work activity
roles	expert-novice model	reciprocal learning; "symmetry of ignorance"
teachers / coaches	expound subject matter	engage in work practice
mode	instructionism (knowledge absorption)	constructionism (knowledge construction)

New Forms of Learning of Importance to Lifelong Learning

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

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

Teacher	Student	Example
authority (“sage on the stage”)	dependent, passive	lecture without questions, drill
motivator and facilitator	interested	lecture with questions, guided discussion
delegator	involved	group projects, seminar
coach/critic (“guide on the side”)	self-directed, discovery-oriented	self-directed study group, apprenticeship, dissertation

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**