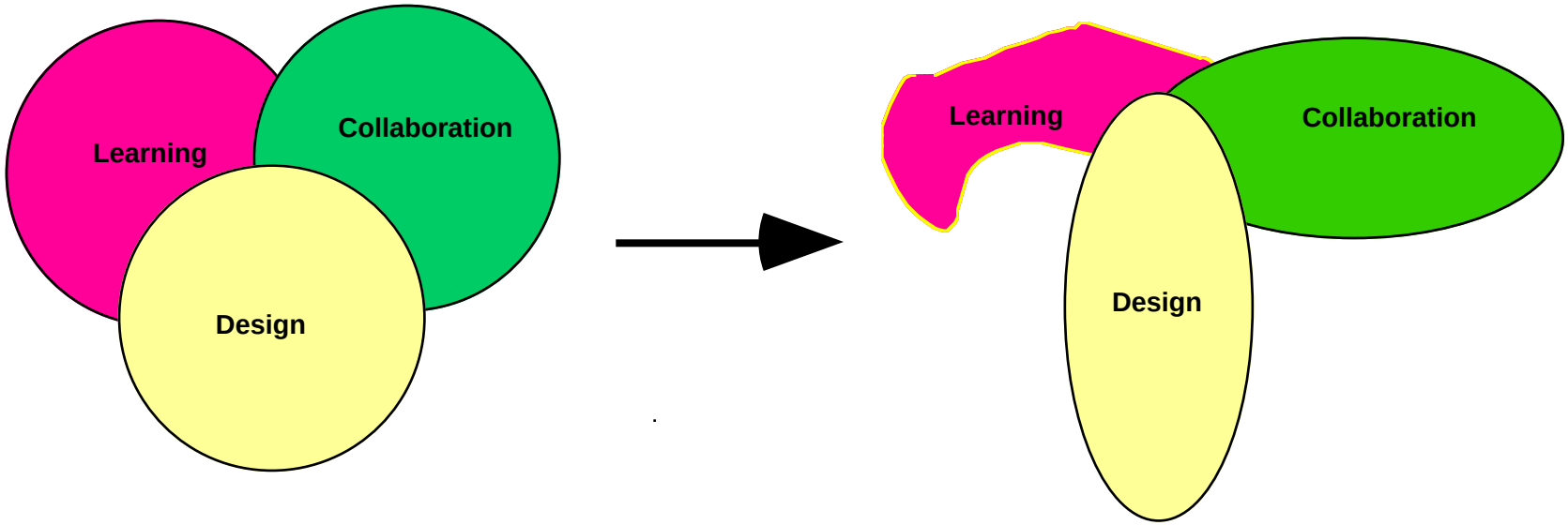

**Wisdom is not the product of schooling but the lifelong attempt to acquire it.**
**- Albert Einstein**

# Design, Learning, and Collaboration
—
# Looking Back

**Gerhard Fischer**
**Spring Semester 2002**

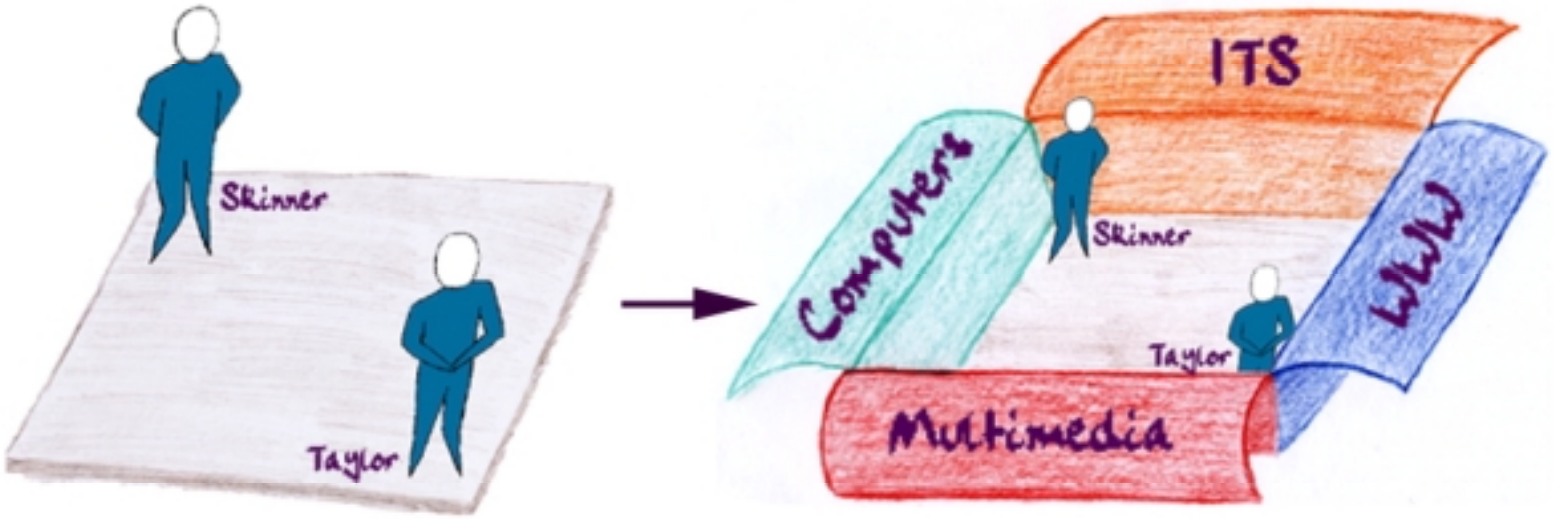
**April 24, 2002**

# Intersection of Design, Learning and Collaboration and their Changing Nature through New Media



# Learning and Media

## Adding Technology to Existing Educational Practice

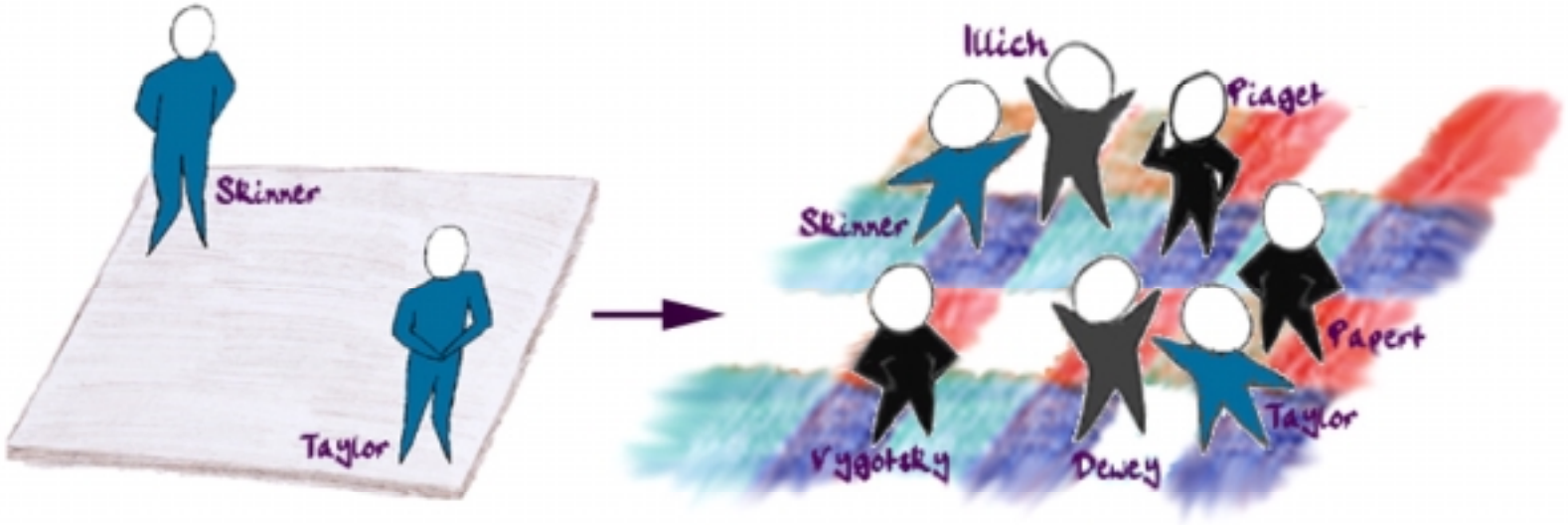



Current Education

Current Education
wrapped in Technology

# Learning and Media

## Rethinking, Reinventing and Reengineering Educational Theory and Educational Practice




Current Education

Computer-supported & Computer-mediated Education of the Future

# Design, Learning, and Collaboration

- **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, .....

- **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.

- **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.

# Innovative System Development Efforts In Support of Design, Learning and Collaboration

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

| | |
|---|---|
| **Domain-Oriented Design Environments (DODEs)** | kitchen design, computer network design, voice dialog design, ..... |
| **Dynasite** | WWW support for collaborative design, Sources, Dynagloss, .... |
| Agentsheets, | substrate for DODEs |
| Visual AgenTalk | simulation, end-user programming |
| Behavior Exchange | sharing the work |
| **Envisionment and Discovery Laboratory (EDC)** | integrated physical and computational environments creating shared understanding, studying authentic problems |
| **PiTABoard** | innovative interaction mechanisms in face-to-face-collaboration |
| **CodeBroker** | software reuse and information delivery |
| **Swiki / Squeak** | organizational memories created by collaborative knowledge construction |

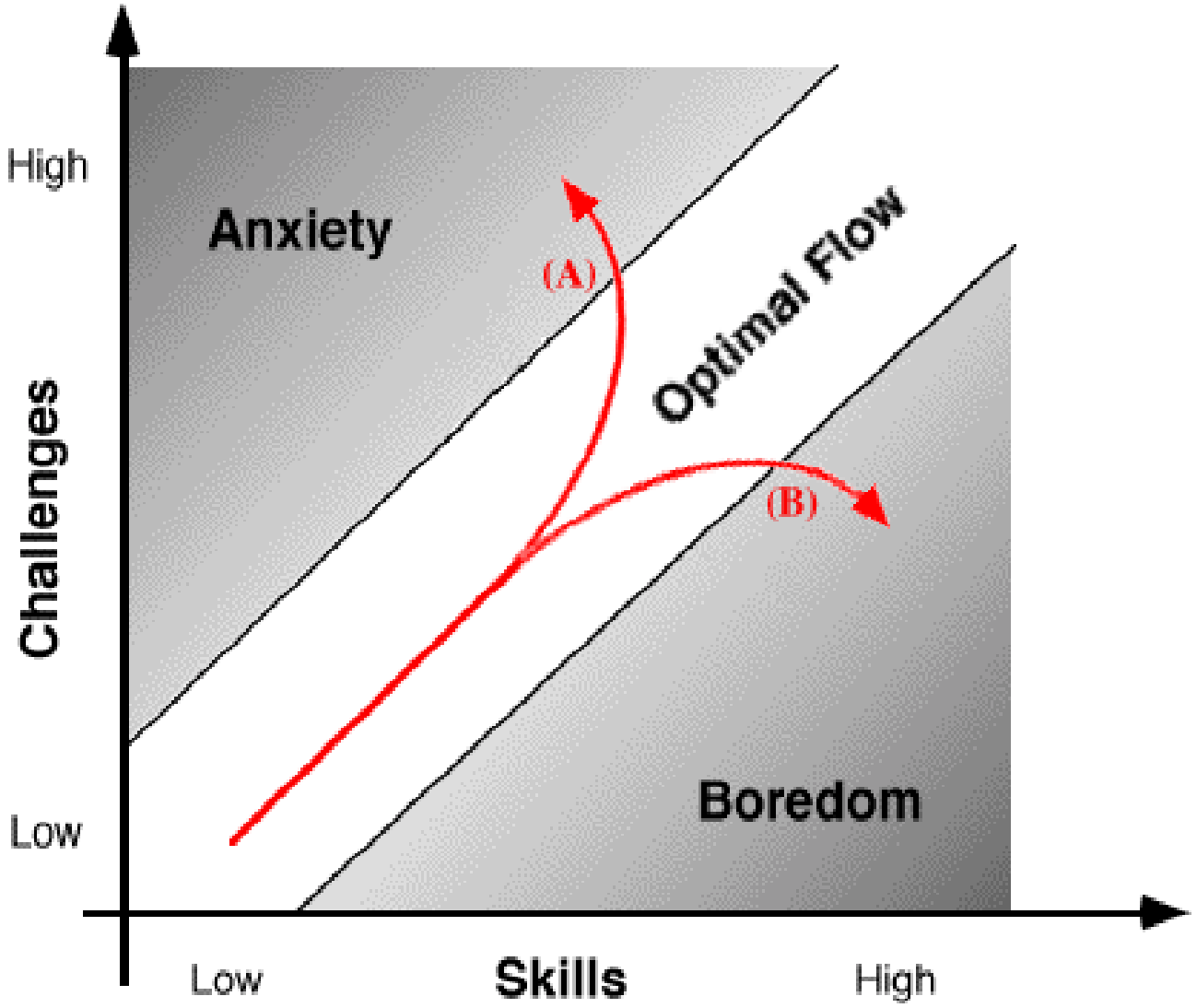
# Self-Application: A "New Culture" for this Course

- "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

# Optimal Flow as a Motivating and Driving Force in Learning



# Mismatch Problem

| 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 |

# The Future

information will not be the scarce resource

computation will disappear into the “background” (or will be more tightly be integrated into people’s lives)

the individual human mind needs to be transcended

distributed cognition will be of fundamental importance

# Some Final Claims and /or Conclusions

- **the future is not out there to be "discovered" — it has to be invented and designed**
  - not only by Hollywood
  - not only by info-enthusiasts
  - not only based on technological determinism

- **but by:**
  - exploring **the fundamentally new possibilities and limitations of computational media** on how we think, create, work, learn, collaborate,
  - moving beyond "technology-driven development" and "gift-wrapping" to **co-evolution**
  - **changing of mindsets** (of learners, teachers, researchers, administrators, institutions, and cultures)