



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

## **Socio-Technical Environments Supporting People with Cognitive Disabilities**

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# Cognitive Levers (CLever) — Helping People Help Themselves

- **support: Coleman Institute** (August 2000 – August 2006)
  
- **objectives:**
  - give people a **voice** that do not have one
  - create more powerful media, technologies, and communities to support new levels of **distributed intelligence**
  - make people more **independent** by assisting them to live by themselves
  
- **independence = a “Faustian Bargain”?**
  - independence should not lead to **social isolation**
  - independence from humans leads to **dependence on tools**
  - how do we avoid an **over-reliance** on tools?
  - an important concepts to be further explored

# ***Distributed Intelligence***

- a theoretical and conceptual framework for **future HCI research**
- **transcends** most traditional approaches in studies on cognition, education, and learning:
  - human cognition does not only exist **“inside”** a person’s head
  - the physical and social surroundings in which cognition takes place cannot be ignored
- more detailed **conceptual developments** based on a distributed intelligence framework:
  - differentiating between **tools for living and tools for learning** (see HCI’2005 publication)
  - analyzing the interplay between **internal and external scripts** (Carmien and Fischer — forthcoming article in collaboration with researchers from Germany)

# ***Distributed Intelligence and Cognitive Disabilities***

- **minds are improvable** → **“anatomy is not destiny”** (Neil Postman)
  - *“The invention of eyeglasses in the twelfth century not only made it possible to improve defective vision but suggested the idea that human beings need not accept as final either the endowments of nature nor the ravages of time. Eyeglasses refuted the belief that anatomy is destiny by putting forward the idea that our minds as well as our bodies are improvable!”*
  
- **distributed intelligence** = conceptual framework for the design and development of socio-technical environments
  
- **specific developments embedded in this framework:**
  - human-centered public transportation systems (Jim Sullivan: “Mobility-for-All”)
  - end-user development environments for prompting systems (Stefan Carmien: “Memory Aiding Prompting System”)
  - monitoring systems to integrate technical and human components (Andrew Gorman and Anja Kintsch: “LifeLine”)
  - ethnographic studies about adoption (Melissa Dawe: “Desperately Seeking Simplicity”)
  - recent new development: life histories (see HCI’2005 publication)

## Some **Design Criteria** for **Socio-Technical Environments** Derived from a **Distributed Cognition Perspective**

- complex socio-technical environments cannot be designed and evaluated **in the laboratory alone**
- **personalization** and **user modeling** techniques are critical
- **context-aware** ubiquitous computational environments are necessary
- designing **dual-use technologies** is important to widespread adoption
- **trade-off analysis** between tools for living and tools for learning