



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**

Using a Sabbatical for Lifelong Learning

Gerhard Fischer

Presentation, L3D, August 2003

Abstract

I will describe all the exciting things that I learnt during my sabbatical year

—

and I am looking forward to hear from all of you how you pushed science forward while I was away!

New Zealand

- **some facts:**

- 4 Million People (less than 1 Million on the South Island)
- 50 Million Sheep

- **everything is different:**

- Christmas is the time to go for a beach party
- they drive on the “wrong” side of the road
- the sun is in the north in the middle of the day
- the southerly winds are the cold ones

- **questions:**

- what is the name of the indigenous people?
- which objects are named “Kiwi”?
- what is the distance between New Zealand and Australia?



Work

▪ Books Read

- Florida, R. (2002). The Rise of the Creative Class and How It's Transforming Work, Leisure, Community and Everyday Life. New York, NY, Basic Books.
- Shneiderman, B. (2002). Leonardo's Laptop — Human Needs and the New Computing Technologies. Cambridge, Mass, MIT Press.
- Wenger, E. (1998). Communities of Practice — Learning, Meaning, and Identity. Cambridge, UK, Cambridge University Press.
- Bennis, W. and P. W. Biederman (1997). Organizing Genius: The Secrets of Creative Collaboration. Cambridge, MA, Perseus Books.

▪ Talks Given

- University of Canterbury, Christchurch
- University of Waikato, Hamilton
- University of Sydney (Judy Kay)
- University of Technology, Sydney (Ernest Edmonds and Linda Candy)
- Intelligent Interactive Technologies Research Group, CSIRO, Sydney
- Centre for Lifelong Learning and Development, Adelaide
- Murdoch University, Perth

Masterclass and Symposium, March 2003

- **Masterclass “Interacting With and Through Next Generation Computing Environments”** (organized by Andy Cockburn, see <http://www.cosc.canterbury.ac.nz/masterclass/>) with

- Ben Shneiderman
- Jenny Preece
- Stephen Brewster
- Gerhard Fischer

→ Erskine Fellowship

- **Symposium “Social Creativity: What is it, why is it needed, and how can we support it?”** with

- Kumiyo Nakakoji
- Kouichi Kishida
- Yasuhiro Yamamoto
- David Redmiles
- Ernest Edmonds and Linda Candy

L3D's Research Focus and "Branding"

- **Artificial Intelligence (AI) → Intelligence Augmentation (IA)**
 - replacement → empowerment
 - emulate → complement (exploit unique properties of new media)
- **instructionist learning → constructionist learning**
 - learning about → learning to be
 - when the answer is known → when the answer is not known (collaborative knowledge construction)
- **individual → social (distributed cognition, social creativity)**
 - knowledge in the head → knowledge in the world
 - access → informed participation
- **generic → specific ("universe of one")**
 - design → meta-design (adaptive, adaptable, situated)
 - general → customization, personalization
- **"gift-wrapping" with new media → co-evolution of new media, new theories about thinking / working / learning / collaborating, and new organizations**

Papers Published

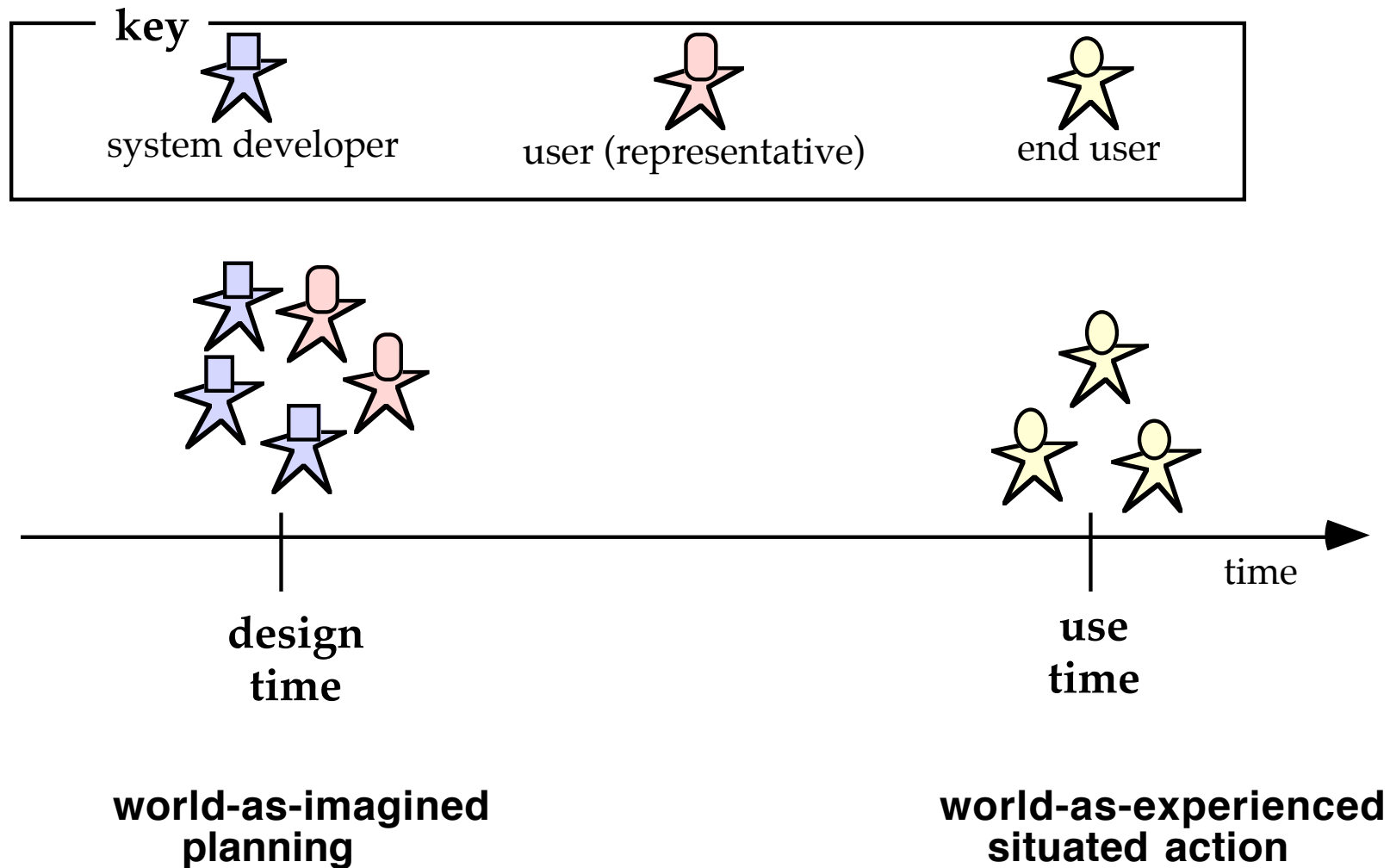
- Fischer, G. (2002). Beyond 'Couch Potatoes': From Consumers to Designers and Active Contributors, in FirstMonday (Peer-Reviewed Journal on the Internet).
- Fischer, G. and J. Ostwald (2002). Transcending the Information Given: Designing Learning Environments for Informed Participation. Proceedings of International Conference on Computers in Education (ICCE 2002), Auckland, New Zealand, IEEE Computer Society, Los Alamitos, Calif.
- Fischer, G. (2003). "Desert Island: Software Engineering — A Human Activity." International Journal Automated Software Engineering, Kluwer Academic Publishers, Dordrecht, Netherlands, **10**(2): 233-237.
- Fischer, G. (2003). Distributed Cognition: A Conceptual Framework for Design-for-All. Proceedings of HCI International 2003. C. Stephanidis. Crete, Greece, June 2003, Lawrence Erlbaum Associates, Mahwah, NJ. **Vol. 4**: 78-82.
- Fischer, G. (2003). Meta—Design: Beyond User-Centered and Participatory Design. Proceedings of HCI International 2003. J. Jacko and C. Stephanidis. Crete, Greece, June 2003, Lawrence Erlbaum Associates, Mahwah, NJ. **Vol. 1**: 88-92.

Papers to Be Published

- Fischer, G., E. Scharff, and Y. Ye (2003). Fostering Social Creativity by Increasing Social Capital. Social Capital and IT. M. Huysman and V. Wulf, (in press).
- Fischer, G. and J. Ostwald: “Creating and Sharing Knowledge in Communities of Practice and Communities of Interest in Collaborative Design”, in R. Bromme, F. Hesse, and H. Spada (eds.): “Barriers and biases in computer-mediated knowledge communication - and how they may be overcome”, Computer Supported Collaborative Learning Series, Kluwer (in press)
- R. dePaula and G. Fischer: Knowledge Management — Why Learning from the Past is not Enough”, Contribution to a Book (editor: Joseph Davis) based on the Workshop “Knowledge Management and the Global Firm: Organizational and Technological Dimensions”, University of Sydney, February 2003

Ideas Struggled With

Design Time and Use Time



Meta-Design — Beyond User-Centered Design and Participatory Design

- **user-centered design:**
 - analyze the needs of the users
 - understand the conceptual worlds of the users
- **participatory design**
 - involve users more deeply in the process as co-designers by empowering them to propose and generate design alternatives
 - focus on system development at design time by bringing developers and users together to envision the contexts of use
- **limitations of user-centered design and participatory design →** despite the best efforts at design time, systems need to be *evolvable*
 - to fit new needs
 - account for changing tasks
 - incorporate new technologies
- **Elisa Giaccardi:** “Principles of Metadesign — Processes and Levels of Co-Creation in the New Design Space”; at:
http://x.i-dat.org/~eg/research/texts/my_dissertation.pdf

Traditional Design versus Meta-Design

Traditional Design	Meta-design
guidelines and rules	exceptions and negotiations
representation	construction
content	context
perspective	immersion
certainty	contingency
resolution	emergence
top-down	bottom-up
autonomous mind	distributed mind
creation	co-creation
specific solutions	solutions spaces
art	interactive art

Distributed Cognition and New Media

- **media as extensions of humans:** the history of the human race is one of ever-increasing intellectual capability; our brains have gotten no bigger, our hands no more nimble, but there has been a steady accretion of new tools for physical and intellectual work
- the **major step forward:** invention of reading and writing → **question: will digital media lead to another quantum jump?**
- **digital media / computer science**
 - have we seen most of it or are we just at the beginning?
 - Winston Churchill: "This is not the end. It is not even the beginning of the end. But it is, perhaps, the end of the beginning."
 - Neil Postman, "Amusing Ourselves to Death", p 7:
"You cannot use smoke signals to do philosophy. Its form excludes the content"

Distributed Cognition (with Stefan Carmien)

- Fischer, G. (2003). Distributed Cognition: A Conceptual Framework for Design-for-All. Proceedings of HCI International 2003. C. Stephanidis. Crete, Greece, June 2003, Lawrence Erlbaum Associates, Mahwah, NJ. Vol. 4: 78-82.

- collaboration with Stefan Carmien: differentiate between
 - tools for living
 - tools for learning

Tools for Living

- **definition:** do task **with** tools

- **examples:**
 - **eye-glasses:** to compensate for poor eyesight (□ question: is the correction of eyesight with “lasik surgery” conceptually different?)

 - **pencil and paper** (literacy): to overcome the limitations of short-term memory

- **opportunity:** while some people might have no problems to learn to perform the tasks without the tools (e.g., spelling), they use tools for doing these “low level” tasks and can therefore focus on the more interesting tasks

- **independence:**
 - people will be **dependent** on the tool
 - but: the availability of the tool (e.g., the tools to be developed in the “Mobility for All” project) may give people the **independence** to engage in personally relevant activities (e.g., mobility)
 - analyze how **interdependence/socialization** in one dimension can increase **independence** in another dimension?

Tools for Learning

- **definition:** people learn to perform the tasks over time without tools (an objective of many things students learn in school)
- **examples:** hand-held calculators, spelling correctors (for people with dyslexia?)
- **independence:** people will become independent of these tools
- **where are the boundaries?**
 - Bateson's example of a blind man with a stick □ "Suppose I am a blind man, and I use a stick. I go tap, tap,tap. Where do I start? Is my mental system bounded at the hand of the stick? Is it bounded by my skin? Does it start halfway up the stick? Does it start at the tip of the stick?"
- **external resources**
 - profoundly affect our conception of what, how, and why one needs to know and learn
 - put greater emphasis on access to tools to-think-with than a solo understanding without tools

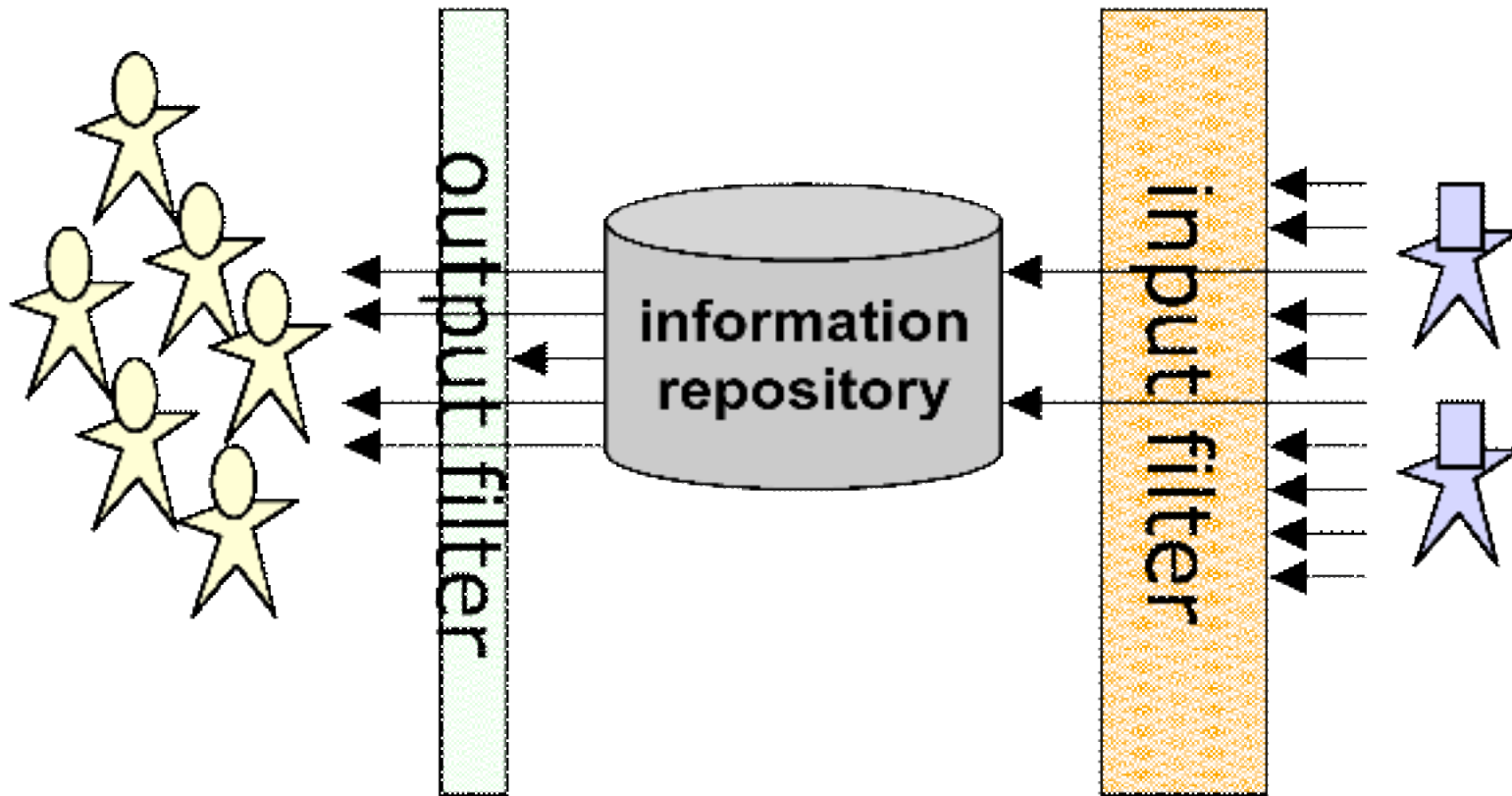
New Relationships between Consumer and Producers (with Yunwen Ye)

- Producer/Consumer Models in a **Consumer** Culture (“Access”) → **Design** Culture (“Informed Participation”)

- **Examples:**

- | | | |
|---|---|---|
| - traditional publication process | ↔ | Web |
| - CHI conference | ↔ | HCI International |
| - traffic information from police | ↔ | traffic information from drivers
(via cellular phones) |
| - limitation:
Making All Voices Heard | ↔ | Trust and Reliability of Information |

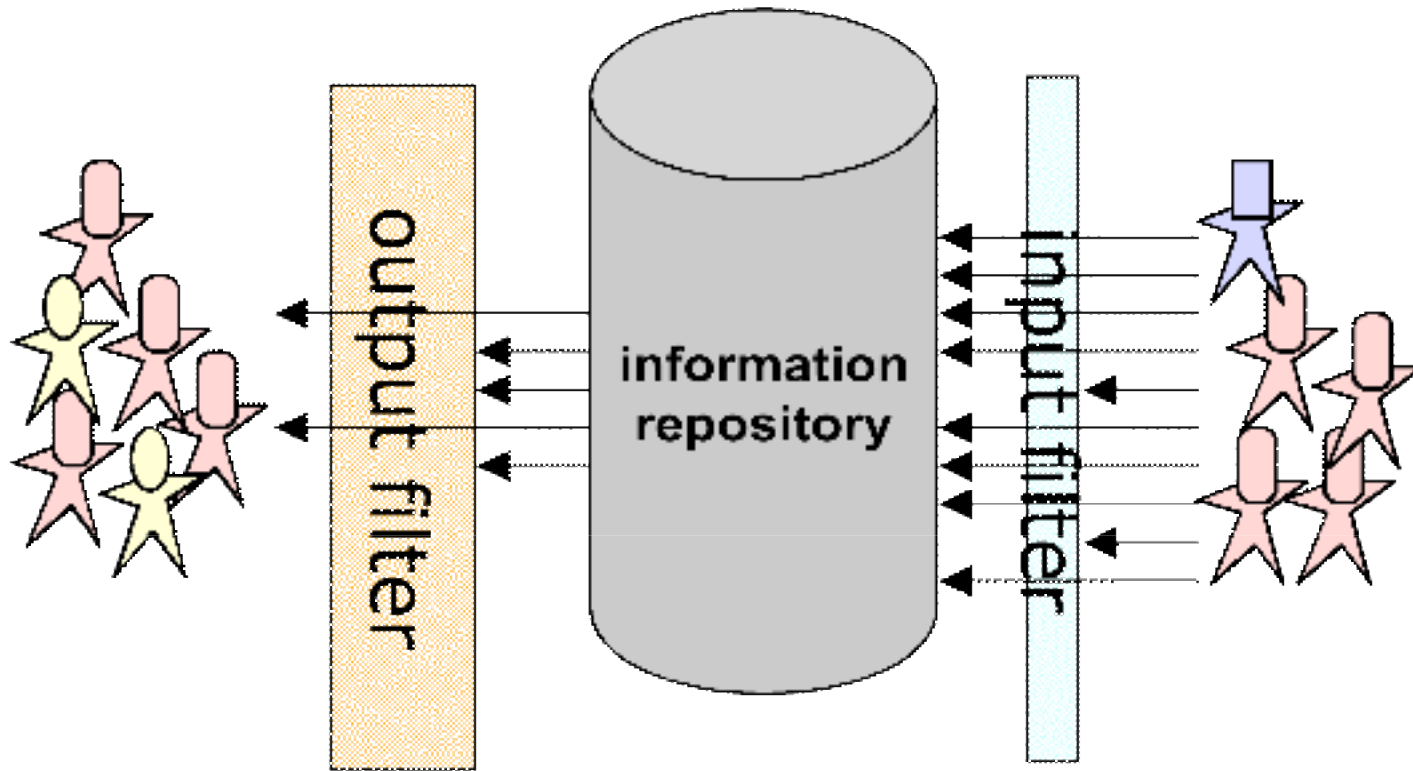
Producer/Consumer Models in a **Consumer Culture** (“Access”): Strong Input Filters, Small Information Repositories, Weak Output Filters



Limitation: Making All Voices Heard

Design Culture (“Informed Participation”):

Weak Input Filters, Large Information Repositories, Strong Output Filters



Limitation: Trust and Reliability of Information

What I Have Not Achieved → Many Things

- book written
- emerged as a powerpoint wizard
- written many programs (learnt: Agentsheets, Java, Squeak,)
- see the movie “Whale Rider”
-

The Fine Line – the Challenge of a Sabbatical

being away ↔ avoid that things fall apart