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Life Long Learning: Möglichkeiten zur Unterstützung durch neue Technologien

Graz, 20.09.2006


Guten Morgen!

Overview first

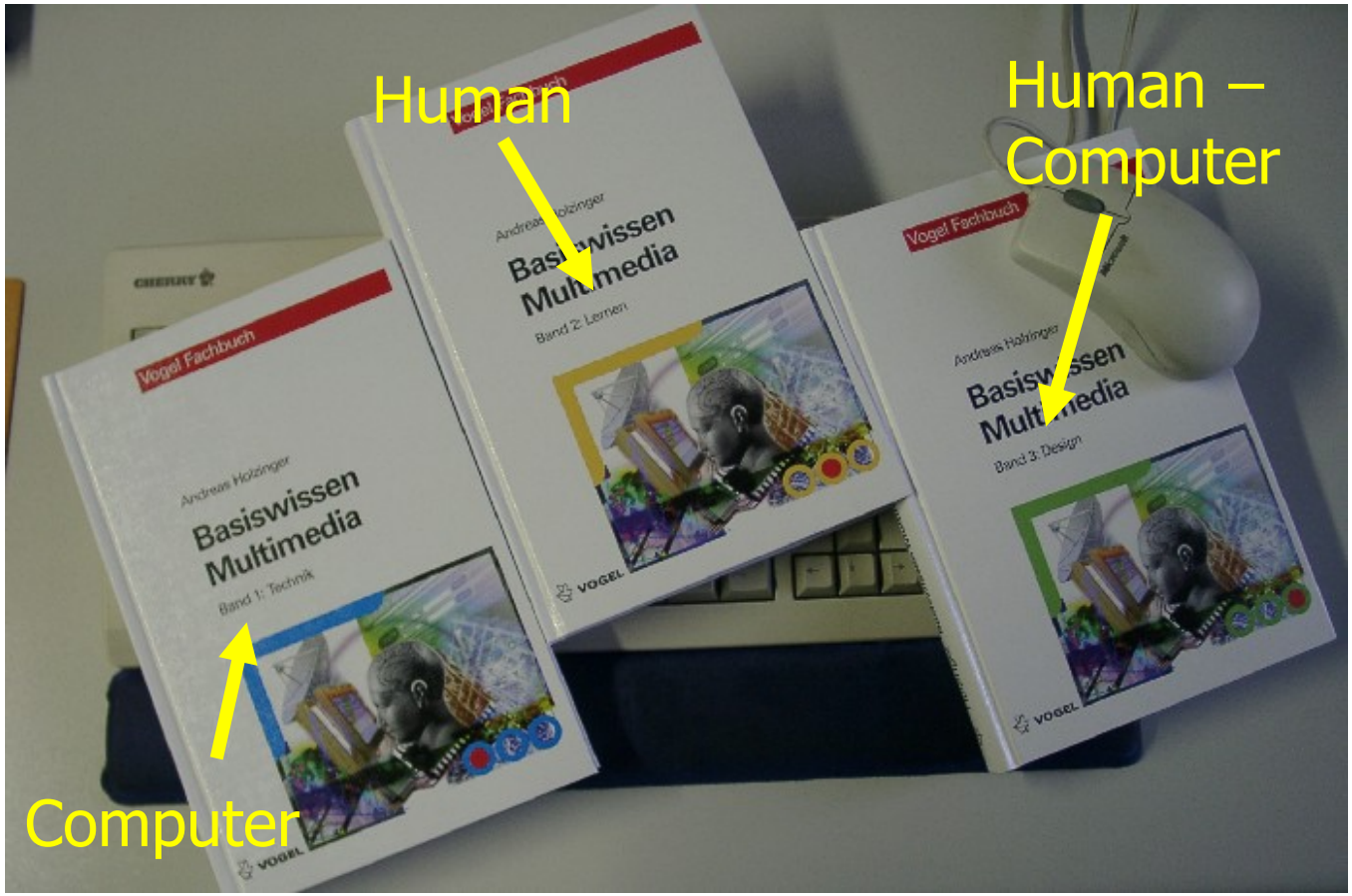
Zoom and Filter,

Then Details on demand ...

Shneiderman (1996)

www.basiswissen-it.at

www.basiswissen-multimedia.at



Psychology **e-Education** Informatics

Human-Computer Interaction & Usability Engineering


e-Learning …

e-Learning is just LEARNING.

Only the tools are different.

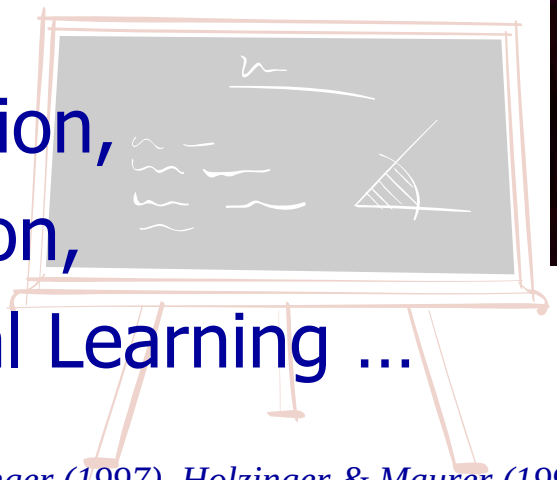
- 1490 : "Dear Gutenberg, Wonderful but … what else can we do with it … apart from printing the bible?"
- 1895: "Dear Marconi, interesting that you managed to transmit letters over the air … but this seems to be a rather useless technology …"
- 1980: "Why should users use mobile phones if we have a phone box at every corner?"
- 1990 "Why should workers use emails if they can fax on papers?"
- 2000: "Why should kids use SMS messaging if they can talk to each other by phone?"
- 2004: "Why should students learn outdoor if they don't even want to do it in classrooms in front of comfortable PC workstations?"

Interesting: Media does not matter …

- Gavriel Salomon (1984):
  Rich media may be more entertaining but it doesn't necessarily lead to better learning!

- Richard E. Clark (1994):
  Media will never influence learning

- Hermann Maurer (1996):
  e-Learning is only ONE part of Knowledge Management



- Visualization, Animation,
- Interaction, Simulation,
- Motivation, Incidental Learning …

Holzinger (1997), Holzinger & Maurer (1998), Holzinger (2000)

Learning is a continuing process ...

- cognitive
  constructive
  self regulated
  situative
  individual
  emotional ...

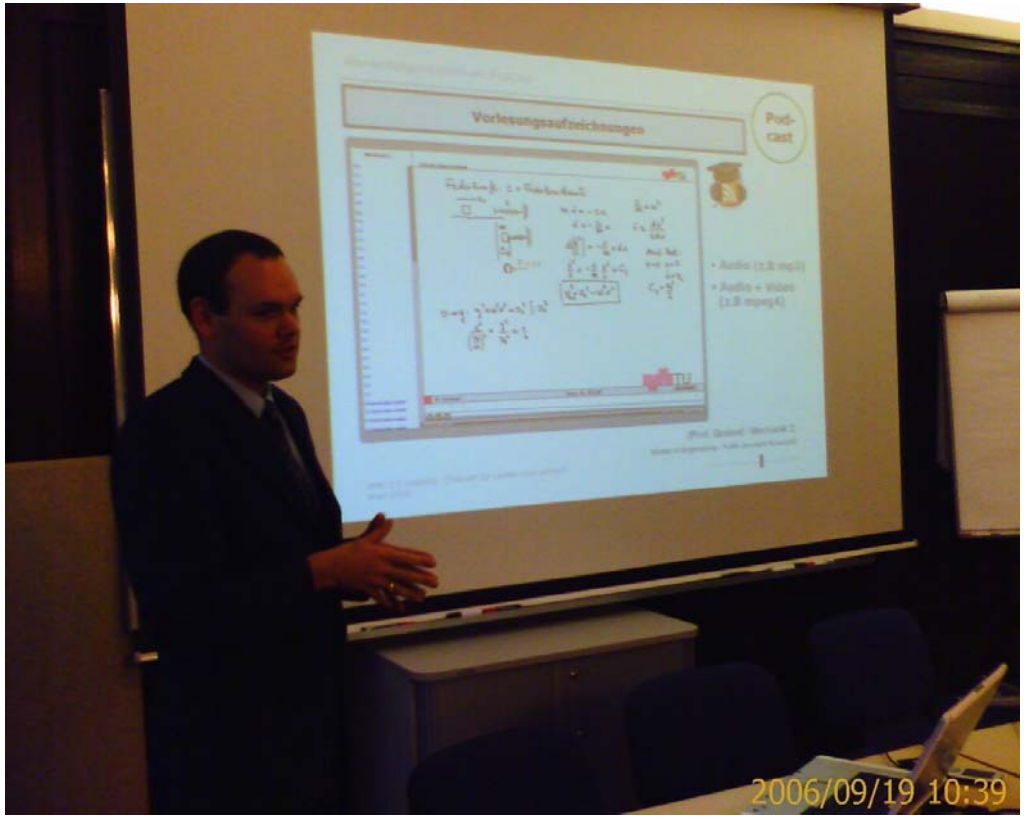
Piaget (1962), Papert (1991)

www.gsi.berkeley.edu *www.papert.org*

... it is an construction within every individual human memory ...

Glasersfeld (1987), Knuth & Cunningham (1993), Holzinger (1997, 2000)

And teaching ?



„Teaching does not cause learning. Only the students' processes do."

Van Lehn (1993)

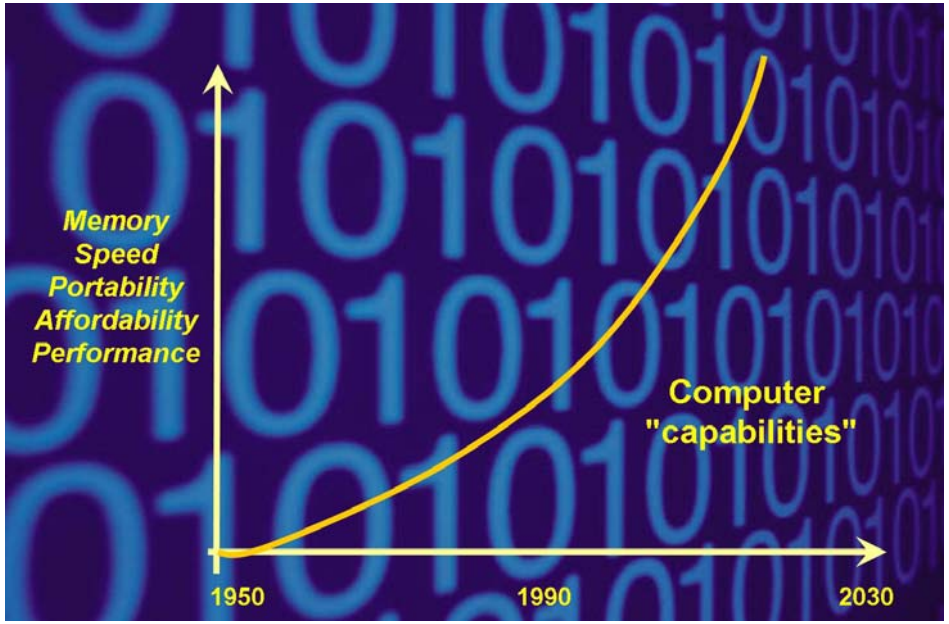
continous learning process - the whole life span!

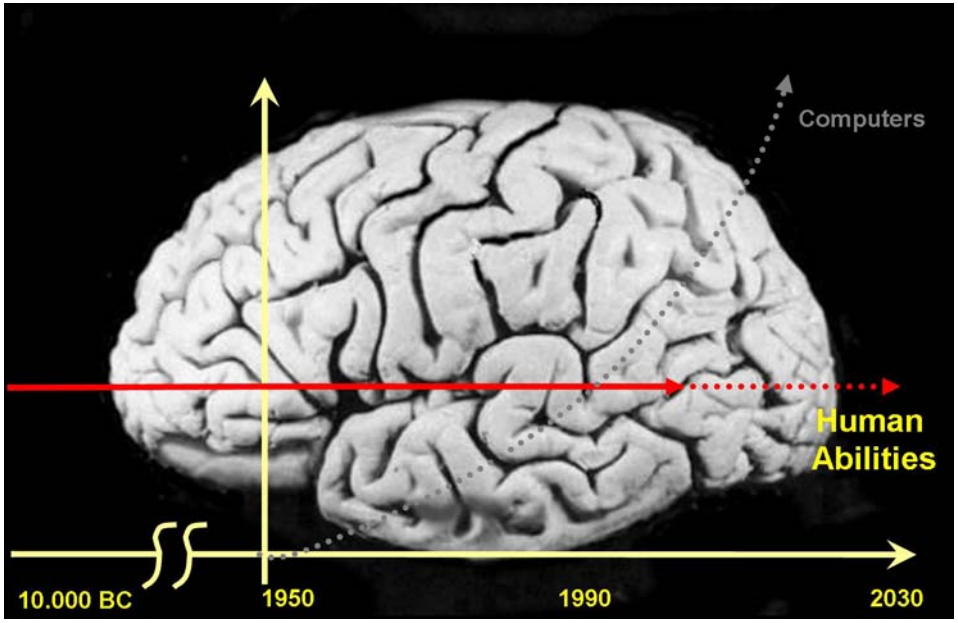
... Life Long Learning e-Generation

Within our e-Society, it is obvious that knowledge acquired at schools and universities – whilst being a necessary basis – may be insufficient for the whole life span ...

eEurope i2010

Progress within our Knowledge Society …





Moore (1997), cf. Holzinger (2002)

Atkinson (1965), Hall (1988), Buxton (2001)

⇒ Today: Life Long Learning (LLL) is NECESSARY

⇒ Working and Learning are close together

⇒ Transdisciplinary Research & Development

- Encompassing all age groups
- Supporting working = learning
- Universal access to the Information Society

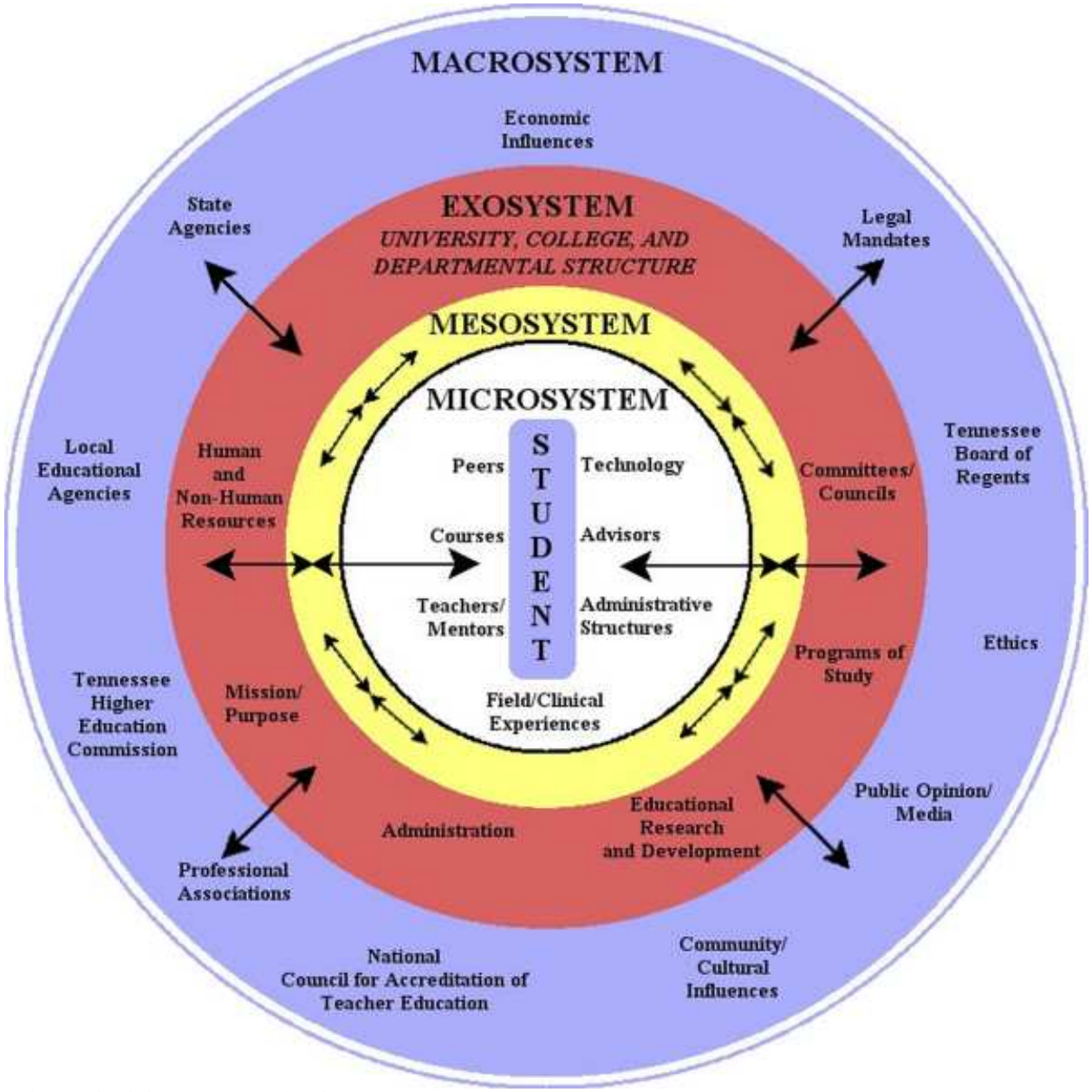
- PAST – traditional learning: sit, listen, repeat → Information Economy – knowledge is proprietary, hoarded; focus on factual knowledge
- PRESENT – Paradigmatic Shift from Information to Knowledge Economy, Shared Knowledge, Learning becomes strategic important,
- FUTURE – Pervasive e-Education: no boundary between Learning and Working, focus on procedural knowledge

Pervasive e-Education …

"According to the principles of Constructivism, pervasive learning must allow the use and combination of all primary media functions to a maximum"

Papert & Harel (1991), Knuth & Cunningham (1993), Holzinger & Nischelwitzer (2005)

Research in e-Education at 3 Levels …

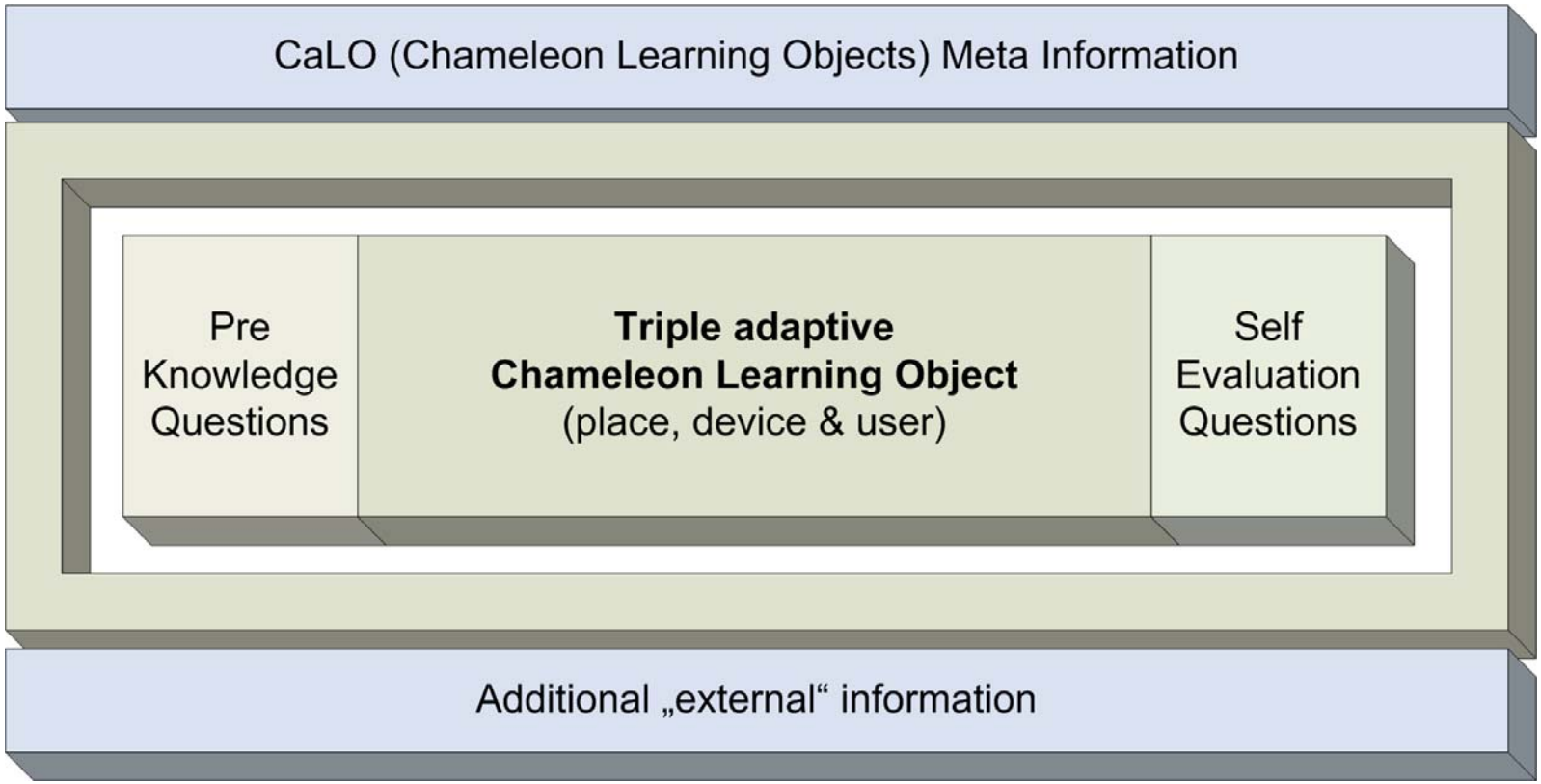


Urie Bronfenbrenner
(1917 – 25.Sept. 2005)

Bronfenbrenner (1978, 81, 90)

- Personalized: Customized to the learners objectives, existing skills, previous knowledge, learning style, ...
- Interactive: Engage the learner in active learning, Just-in-time to satisfy current needs
- Learner-centric: Focus on the needs of the learners rather than to the abilities of the instructor

Example Model: Triple Adaptive CaLO



Holzinger & Nischelwitzer (2005)

Triple Adaptive Chameleon Learning Object

- Level 1: Place → Location Adaptation
- Level 2: Device → Hardware Adaptation; and
- Level 3: User → End-User Adaptation

Level 1: Location Adaptation

- Current context awareness;
- Location information;
- User interface adaptation for the current necessary interaction;

Level 2: Hardware Adaptation

- Connectivity for different device types (Automatic rendering);
- Support different user interface structures;
- Device type detection and related content adaptation;

Level 3: User adaptation

- End-user preliminary knowledge (e.g. LO(t) uses information of all LO's (t-1) to LO's (t-n), which have already been (partly) adapted;
- End-user behavior through the evaluation of the pre-knowledge questions and the self evaluation questions;
- Knowledge gap detection;

Complexity as a barrier …

$$u = \frac{1}{n_f} \Big| n_f \geq 1, n_f \in Z$$

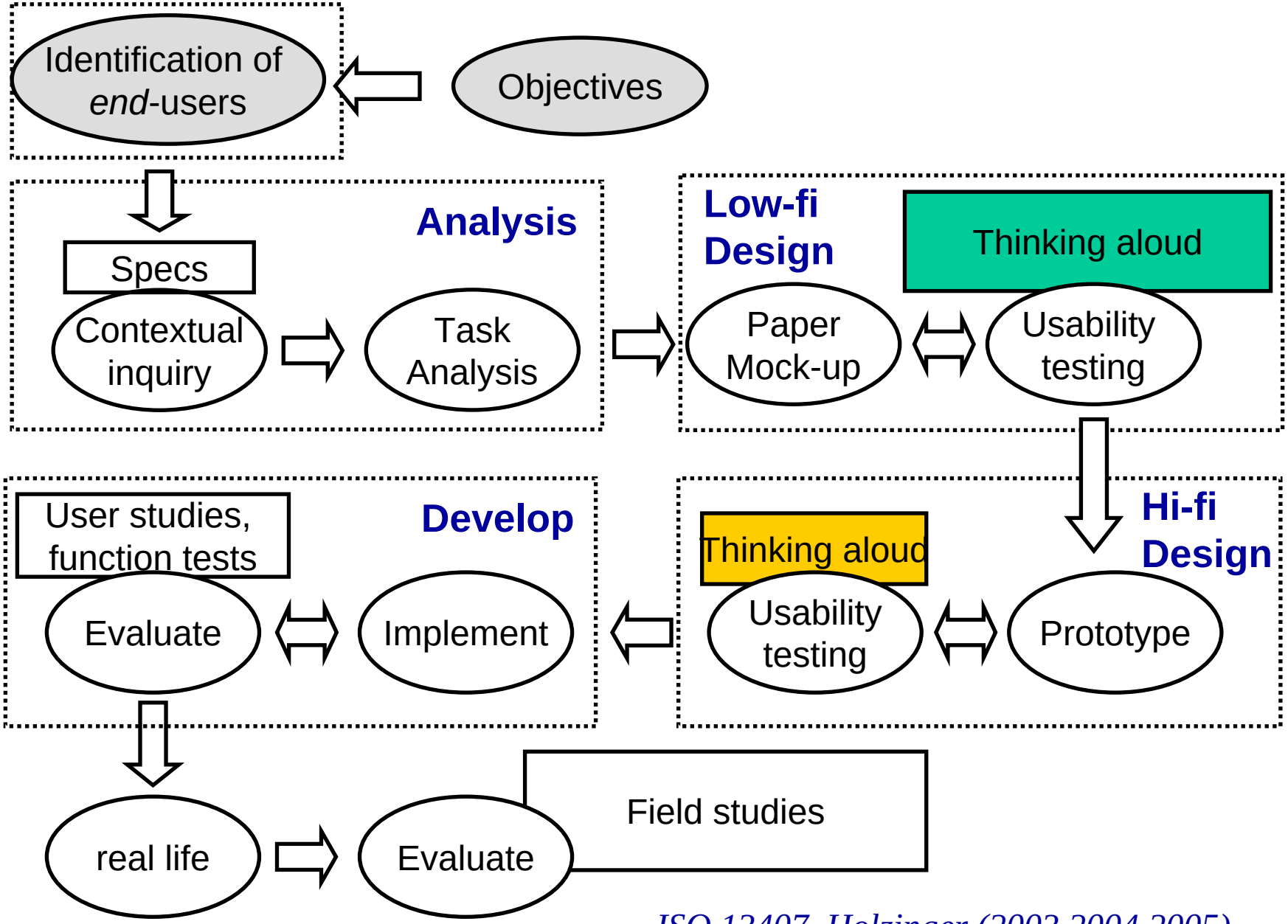
- Complexity! Technical knowledge required, regular software installation, updates & maintenance, loads of unwanted features, crashes, ...
(Buxton, 2001, Marcus, 2004)

Mark Weiser (1952-1999)

http://www-sul.stanford.edu/weiser

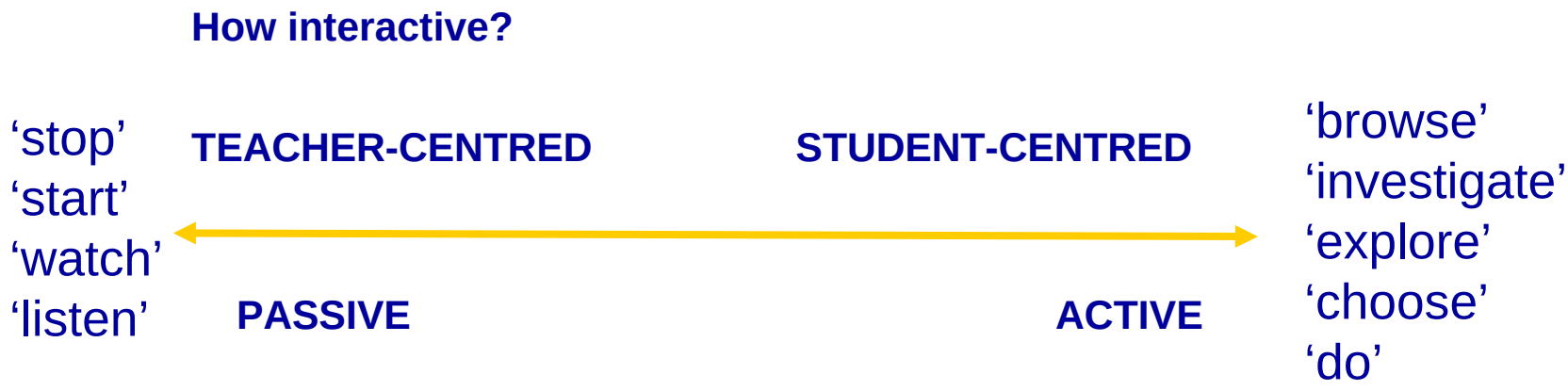
- The most profound technologies are those that disappear
  (Weiser, 1991)
- Only when things disappear are we freed to use them without thinking about them
  (Abowd & Mynatt, 2000)

User Centered Development (UCD)



ISO 13407, Holzinger (2003,2004,2005)

- Interactivity



Motschnig & Holzinger (2002)

cf. Leeder & Davies (2002)

Effort

start
stop
watch
listen
repeat

TEACHER-CENTERED

PASSIVE

STUDENT-CENTERED

ACTIVE

browse
investigate
explore
experiment
choose
do

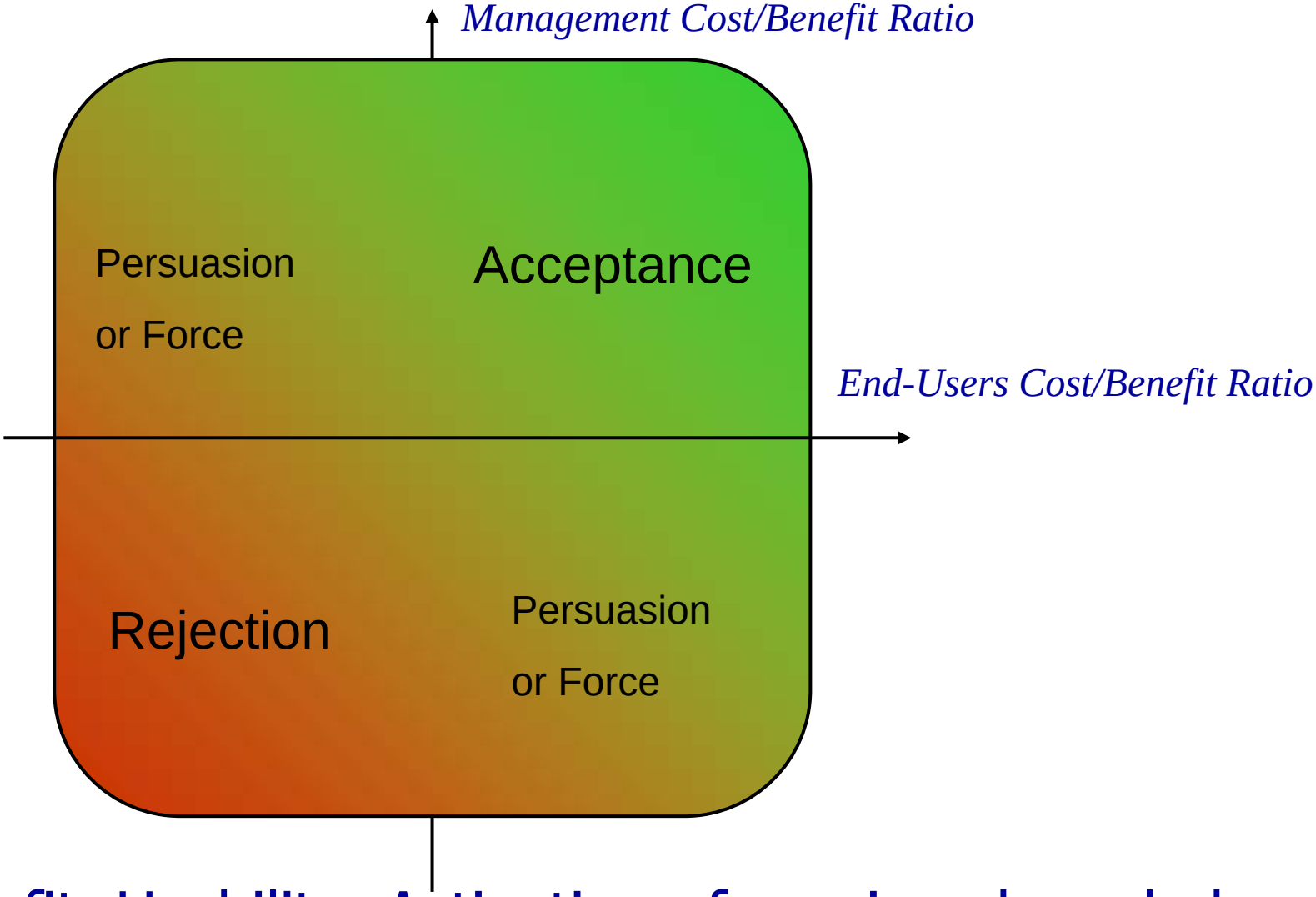
Degree of Student-Centeredness

cf. Leeder & Davies (2002)

Example: iTunes University at Stanford

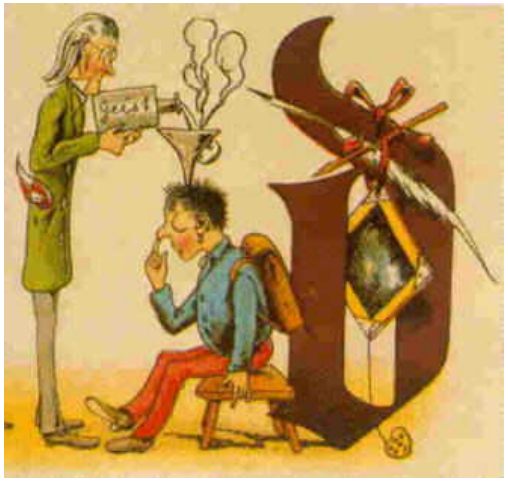
http://itunes.stanford.edu/

Conclusion (1): WHEN is e-Education successful ?



Profit, Usability, Activation of previous knowledge, … BENEFIT for the end-users!

Conclusion (2)



Wilhelm Busch (1832-1908)

Shall we make learning as easy as possible?

- Learning requires cognitive effort!
- Successful learning results in permanent understanding of contexts and
- in mastering problems (zone of developments) – not just fun of edutainment!

Transdisciplinary, phenomena orientated Research AND Development

Psychology **e-Education** **Informatics**

Human-Computer Interaction & Usability Engineering

OESTERREICHISCHE COMPUTER GESELLSCHAFT
AUSTRIAN COMPUTER SOCIETY

- WG HCI & UE of the Austrian Computer Society
- 110+ members (current)
- → Special Interest Group (SIG) HCI4EDU
- Bringing together Psychology ↔ Education ↔ Informatics
  - Learning, Teaching & Motivating with innovative eLearning Concepts
  - Learner Centered Design and Development (LCD)
  - Simulation based learning (SBL)
  - Adaptive Learning Environments (ALEs)
  - Multimodal Interfaces for e-Learning (MIeL)
  - ...

Human-Computer Interaction (HCI)
& Usability Engineering (UE) is **integrating**

Holzinger (2002, 2003, 2004, 2005), Holzinger & Motschnig (2005)

Our aim is

to bring together People from
***M**edia Psychology*
***M**edia Informatics*
***M**edia Education*

The Power of M³

http://www.ifs.tuwien.ac.at/usab-symposium

Richard E. Mayer (2005)

- We need much more research to help define the learning goals that best profit from new technologies … in **real-life** …

Let us together make e-Education usable and accessible for all

Thank you!

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to bring together People from
***M**edia Psychology*
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The Power of M³

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