Considering the Human in Multimedia: Learner Centered Design (LCD) & Person Centered eLearning (PCeL)
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My home-team...

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"The old computing is about what computers can do; The new computing is about what people can do"
Shneiderman (2002)

Rich media may be more entertaining but it doesn’t necessarily lead to better learning!

Exceptions:
- Simulations,
- Animations,
- Visualization &
- Motivational Effects

Richard Clark (1994):
*Media will never influence learning,*
*Educational Technology R&D* (42), 21-29

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

1.4.05 Klagenfurt

Fundamental Idea of a LO

- Theory of atoms (Democrit, 400 B.C.)
- Information Chunck (Miller, 1956)
- OO-Theory (Dahl & Nygaard, 1966)

"…. a fundamental idea is that a learning object can stand on its own and may be reused."

BUT PLEASE: Learning is a basic cognitive process ... not an object...


A personal remark ...

e-Learning is just learning.
Only the tools are different.
Methods versus Media

Methods cause learning

Practice
Simulation
Discussion
Presentation
Demonstration

Media deliver information

Multimedia Design

Human-Computer Interaction (HCI)
includes both, methods and media

Holzinger (2003), Holzinger (2004)
Goals of Usability Engineering

- Ease of learning
  - Grasp, understand fast, efficient, effective ...
- Recall
  - Remember materials for a long time ...
- Productivity
  - Perform tasks quickly and efficiently ...
- Minimal error rates
  - Adapt in new situations ...
- High end-user satisfaction
  - Confident of success ...

Definition of Usability

<table>
<thead>
<tr>
<th>Dimension</th>
<th>Description, e.g. ...</th>
<th>Benchmark</th>
</tr>
</thead>
<tbody>
<tr>
<td>(1) LEARNABILITY</td>
<td>Low start-up overhead ...</td>
<td>Time to perform task</td>
</tr>
<tr>
<td>(2) EFFICIENCY</td>
<td>Achieving high productivity ...</td>
<td>Measuring task performance</td>
</tr>
<tr>
<td>(3) MEMORABILITY</td>
<td>Easy to remember ...</td>
<td>Time to repeat task</td>
</tr>
<tr>
<td>(4) FAULT-TOLERABILITY</td>
<td>Easy to recover from errors ...</td>
<td>Number of errors</td>
</tr>
<tr>
<td>(5) SATISFACTION</td>
<td>Pleasant to use ...</td>
<td>Users subjective opinion</td>
</tr>
</tbody>
</table>

### Objective Effectiveness Efficiency Satisfaction

<table>
<thead>
<tr>
<th>Suitability</th>
<th>% of goals achieved</th>
<th>Time to Complete</th>
<th>Subjective Rating</th>
</tr>
</thead>
<tbody>
<tr>
<td>Appropriateness</td>
<td># of power features used</td>
<td>Relative to expert</td>
<td>Rating of power</td>
</tr>
<tr>
<td>Learnability</td>
<td>% learned</td>
<td>Time to learn</td>
<td>Rating of learning</td>
</tr>
<tr>
<td>Error</td>
<td>% errors corrected</td>
<td>Time to correct</td>
<td>Rating of error handling</td>
</tr>
</tbody>
</table>

*Dix et al. (1998), ISO 9241, ISO 13407*

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### Teacher-Centered

"Knowledge" (BEWARE!) is transmitted from teacher to student

### Learner-Centered

Students construct Knowledge (Yes!) through gathering and synthesizing information and integrating it with the general skills of inquiry, communication, critical thinking and problem solving.
Teacher-Centered

Emphasis is on acquisition of knowledge outside the context in which it will be used.

Learner-Centered

Emphasis is on using and communicating knowledge effectively to address enduring and emerging issues and problems in real-life contexts.

“Know thy end-users”

Common dimensions include

- Role – Dominant persona of users (job, affiliation)
- Goals – Reason for the interaction
- Circumstances of Use – Setting, resources, strategy, timing
- Culture – Group level beliefs, language, preferences
- Ergonomics – Relevant perceptual & motor abilities, skills
... is a form of blended learning in which:

A) the computer takes over a major part of the transmission of information, whilst
B) face-to-face phases serve to co-create meaning, develop social and communication skills, and shape interpersonal attitudes.

(Rogers, 1961)
1.4.05 Klagenfurt

**Effort**

- start
- stop
- watch
- listen
- repeat

**Degree of Student-Centeredness**

TEACHER-CENTERED

PASSIVE

STUDENT-CENTERED

ACTIVE

- browse
- investigate
- explore
- experiment
- choose
- do

Cf. Leeder & Davies (2002)

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**Students using material**

What students hate ...

- Download Delays
- Downloading millions of Plug-ins
- Having to Change Fonts or Other Settings
- Having to Reboot after every session
- Long Scrolling Text – endless reading on screens
- Links Within a Page and not finding back
- Dead Ends/Can’t Get Back
- Getting Lost
- No Online Moderator, no instructor available
- Overly Detailed Graphical User Interface
- Unnecessary Distractions (flashing, popping, …)
technology support alone does not make a difference in students’ motivation if it is not matched by interpersonal dispositions of the teacher (=facilitator)

We must provide benefits ...