Mobile and Ubiquitous Technologies for Learning Support

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Activities of CELSTEC

• Three programmes, each with three themes:
  – Learning and Cognition
  – Learning Networks for Professional Development
  – Learning Media

• Each programme integrates three activities:
  – Research Activities
  – Laboratory Activities for Open Innovations
  – Providing Solutions and Services to the market

• Institute for Education & Training
  – MSc Learning Sciences
  – Commercial Training (provided by the staff of 3 programmes)

• Temporary Strategic Programmes
  – Lifelong Learning Services
  – OUNL related programmes (e.g. IPO)
  – Open Educational Resources
#1 Technology Invasion

#2 Learning in invaded land

#3 Ambient Information Channels

#4 Build your Channels
# 1: Invaded Land
computers become ubiquitous and adapt to their environment
Enhanced Environments

network sensors, rooms, intelligent carpets, wall colour, or gesture tracking, building, architects already create completely new facades for buildings, public places and city planning new artefacts will enable dynamic routing and highlighting of space.
Fast Human Enhancements
Magic Artefacts
people change by their tools
AUGMENTED (HYPER)REALITY
immersion
beware of the context
Each year **1.2 billion new phones**, information can be accessed not only in city centres but much more important in **rural areas**, information will grow even more rapidly, mobile devices become more **context-aware**, new **user interfaces**

**Mobile Access**
# 2: Learning in invaded land
Montag, 21. Februar 2011
Open Educational Content and Metadata: MACE Project

Montag, 21. Februar 2011
SenseCam in Context
mobiles as universal tools for reading, discussion, documentation, annotation, and others learning activities.
A variety of senseful learning practices have already been described in 2002.
MOBILES

Time-to-Adoption Horizon: One Year or Less

The unprecedented evolution of mobiles continues to generate great interest. The idea of a single portable device that can make phone calls, take pictures, record audio and video, store data, music, and movies, and interact with the Internet — all of it — has become so interwoven into our lifestyles that it is now surprising to learn that someone does not carry one. As new devices continue to enter the market, new features and new capabilities are appearing at an accelerated pace. One recent feature — the ability to run third-party applications — represents a fundamental change in the way we regard mobiles and opens the door to myriad uses for education, entertainment, productivity, and social interaction.
Sensors for learning
multi-method assessment measuring real world activities, long-term assessment, personal interaction logs, from formal to formative assessment

Displays for learning
embedded displays, reflection in and about action, anywhere anytime delivery, multimodal displays, personal and shared displays
Connecting the World and Digital Media
how do humans learn with augmented objects?
how can we unleash the power of **context** for the design of ubiquitous learning?
context gives meaning, The term context is used in different research disciplines. Linguistics makes two claims about context. Context is defined as the text in which a word or passage appears and which helps ascertain its meaning. The surroundings, circumstances, environment, background or settings which determine, specify, or clarify the meaning of an event.
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Context Dimensions

Context Dimensions
# three: A Model for all of this

Ambient Information Channels
AICHE Processes

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Adaptation Process

Actuators/Indicators Personalization
- PDA Personal Displays
- Auditory Displays
- Terminal Based Adaptive Hypermedia
- Public Displays

Actuators/Indicators Contextualization
- Aggregation Models
- Machine Learning
- Identifying Context of Use
- Sensor Fusion

Semantic Layer
- Implicit Methods
  - Logging
  - Stereotype Reasoning
  - Profiling
  - ...
- Explicit Methods
  - Assessment
  - Questionnaires
  - User Feedback
  - 360° Feedback

Classical User Modeling "Sensors"
- Context Sensors
  - User
    - Location
      - Time
      - Biosensors
      - ...
  - Environment
    - Temperature
    - Lighting
    - Sound
    - ...

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## Aggregation

<table>
<thead>
<tr>
<th>Sensor</th>
<th>AICHE Dimension</th>
</tr>
</thead>
<tbody>
<tr>
<td>GPS</td>
<td>LOCATION</td>
</tr>
<tr>
<td>Compass</td>
<td>LOCATION</td>
</tr>
<tr>
<td>Gyroscope</td>
<td>LOCATION</td>
</tr>
<tr>
<td>User Logfile</td>
<td>ID</td>
</tr>
<tr>
<td>light sensor</td>
<td>ENVIRONMENT</td>
</tr>
<tr>
<td>tag reader</td>
<td>ID</td>
</tr>
<tr>
<td>timecode</td>
<td>TIME</td>
</tr>
<tr>
<td>social network distance</td>
<td>RELATION</td>
</tr>
<tr>
<td>noise</td>
<td>ENVIRONMENT</td>
</tr>
</tbody>
</table>
# Enrichment

<table>
<thead>
<tr>
<th>Aggregated context</th>
<th>Artefact</th>
</tr>
</thead>
<tbody>
<tr>
<td>Location</td>
<td>USER, ARTEFACT</td>
</tr>
<tr>
<td>Direction</td>
<td>USER</td>
</tr>
<tr>
<td>Perspective</td>
<td>CHANNEL</td>
</tr>
<tr>
<td>Preference</td>
<td>USER</td>
</tr>
<tr>
<td>Media-Metadata</td>
<td>CHANNEL</td>
</tr>
<tr>
<td>Location</td>
<td>ARTEFACT</td>
</tr>
<tr>
<td>Time of Day</td>
<td>ARTEFACT, USER</td>
</tr>
<tr>
<td>Weekday</td>
<td>ARTEFACT, USER, CHANNEL</td>
</tr>
<tr>
<td>Sensor</td>
<td>context dimension</td>
</tr>
<tr>
<td>-----------------</td>
<td>-------------------</td>
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<td>GPS</td>
<td>LOCATION</td>
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<td></td>
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MetaMirror
http://www.designbynotion.com/metamirror-next-generation-tv/
Contextualised TV
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Content in Context
contextualised delivery, media creation in learning situations, synchronisation of learning activities, ubiquitous learning environments, mixed reality mash-ups

Reflection in Context
framing of learning activities, visualisation of contextual information, context indicators, multi-channel synchronisation
De Open Universiteit ontwikkelt, verzorgt en bevordert, samenwerkend in netwerken en allianties, hoogwaardig en innovatief hoger afstandsonderwijs. Als de universiteit voor leven-lang-leren stelt zij de uiteenlopende leerbehoeften van mensen in hun levensloop en de noodzaak tot aanzienlijke verhoging van het kennisniveau van de samenleving centraal.

**LINKS**

- [www.ou.nl](http://www.ou.nl)
- Studietest
simple. But they are simple in quite different ways.

**Exercise 3**

Click the links below to listen to these two songs and look at the musical score of Heidenröslein. First read through the poem in English (click the link below), and then follow the words in the parallel text as you listen to each song. You should find that, even if you have little or no knowledge of German, you will, with a little practice, be able to follow the German words as they are sung, and to keep an eye on the meaning through reference to the English translation. Without attempting any detailed analysis, consider in general terms the main differences in character between the two poems and the two songs.

Click below to listen to Heidenröslein.

Click below to listen to Wanderers Nachtlied II.

Click on 'View document' to read these two songs in English and German

Click on 'View document' to view the musical score for Heidenröslein
Object Annotation: ContextBlogger

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Team Awareness team.sPod

News/Death ratio hype!

This is a very nice analysis reporting about current and past catastrophes which calculate a ratio for swine flu and time spent by social media.

Collection: Design Patterns

posted by Jeroen Storm, on 2009-06-18 07:32:44

web2.0 count: 309, shared: 11

tools count: 243, shared: 10

research count: 198, shared: 11

opensource count: 154, shared: 11

design count: 154, shared: 10

software count: 120, shared: 11

education count: 119, shared: 11
Notifications in Mobile Learning

Activities: Mooble
Object Tagging/Augmentation
Location Filtering: Mobile Language Learning

Figure 1 One variation of the language learning software using a room-based search to filter the learning content
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arlearn

ARLearn

Enter a NAME and specify the RANGE.

Name: 

Range: 10m 40m 70m 100m

Attach AUDIO and/or IMAGE and/or TEXT

Audio: Built-in Microphone

Image: Open

Text: 

Orientation & ASSIGNS specific created by email addresses (separated by commas).

Assign: 

Create

Google

SATELLEITAART AANTREKINGS

Aantrekking 177 m
Aantrekking 178 m
Ingang OU 181 m
Aantrekking 182 m
ellende 184 m
AR4Learning


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3D Dynamic Objects

3D Models to visualize concepts of the learning content (Geometry, Math, Astrology, Engineering, Architecture)

multiple perspectives, dynamic media, illustration, enrichment, collaborative digital media

3D Content Educational Pattern
Augmented Books

Enrich a book experience with augmented content, can be 3D Models or contextualized information.
RWO Scanners

Scan RWO for additional information, exploration driven.
Example: Language Learning
Sensor Based Layers

Present POI Information based on the current sensor information got from user device. Example: Wikitude
Collaborative Annotation

Shared digital annotations filtered by user context and following a learning logic. Example: Locatory.
# 5: do it your way ... conceptual modelling
#1 Selecting Artefacts

- **Containers**: Rooms, Buildings
- **Objects**: Cups, Tables, Screen, Machine, Picture, Plant, Computers, Leaflet
- **Positions**: Locations: Views, Perspectives, Zones
#2 Choosing Activities

- **Receive Information:** Video, Text, Audio, *MetaInformation*
- **Explore:** searchInfo, searchMetaInfo, addPerspective, relatedObjects
- **Perform:** doQuiz, performGroupActivity, do360Performance
- **Cooperate:** Discuss, Exchange Views

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#3 Provide resources

- Receive Information: Video, Text, -> hyperlink on mobile Devices
- Explore: online services, web forms
- Perform: online quiz, task
- Cooperate: just instruction
- Contribute: create resources!
<table>
<thead>
<tr>
<th>Artefact</th>
<th>Activity</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>Room</td>
<td>Perform</td>
<td>Instruction</td>
</tr>
<tr>
<td>Artwork</td>
<td>Listen</td>
<td>AudioFile</td>
</tr>
<tr>
<td>Cup</td>
<td>Explore</td>
<td>WebForm</td>
</tr>
<tr>
<td>Food</td>
<td>Discuss</td>
<td>AudioRecorder</td>
</tr>
</tbody>
</table>
Intended Learning Outcomes:

Development of a wide range of abilities appropriate for a beginning medical practitioner, clustered under 4 themes:

- basic and clinical sciences
- patient-doctor
- community-doctor
- personal and professional development.
<table>
<thead>
<tr>
<th>Identifier of artefact</th>
<th>Learning activity</th>
<th>Resource</th>
</tr>
</thead>
<tbody>
<tr>
<td>B134</td>
<td>find something on google</td>
<td><a href="http://google.com">http://google.com</a></td>
</tr>
<tr>
<td>time</td>
<td>action</td>
<td>loc</td>
</tr>
<tr>
<td>------</td>
<td>------------------------------</td>
<td>-------</td>
</tr>
<tr>
<td>&lt;9</td>
<td>viewMountainlight</td>
<td>fixed</td>
</tr>
<tr>
<td>&lt;12</td>
<td>discussMountainProfile</td>
<td>fixed</td>
</tr>
<tr>
<td>&lt;18</td>
<td>goToLocation#C111</td>
<td>fixed</td>
</tr>
<tr>
<td>&lt;24</td>
<td>performPresentation</td>
<td>fixed</td>
</tr>
</tbody>
</table>

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<table>
<thead>
<tr>
<th>social context</th>
<th>action</th>
<th>id</th>
</tr>
</thead>
<tbody>
<tr>
<td>alone</td>
<td>viewMountainlight</td>
<td>fixed</td>
</tr>
<tr>
<td>group</td>
<td></td>
<td>fixed</td>
</tr>
<tr>
<td>friends</td>
<td></td>
<td>fixed</td>
</tr>
</tbody>
</table>

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thank you!
marcuspecht.de
celstec.org
dspace.ou.nl
stellarnet.eu
teleurope.eu

http://hdl.handle.net/1820/2034