E-Learning Technology Development Programme

Prof. Rob Koper (rob.koper@ou.nl)  
Educational Technology Expertise Center  
Open University or the Netherlands  

Heerlen, November, 29th 2004
Content

- Basic Approach, Themes, Projects & Results
Objective of the current Programme

Develop a coherent set of e-learning technologies to establish effective learning networks for lifelong learners.

A *learning network* is a network of persons who create, share, support and study learning resources ('units of learning') in a specific knowledge domain.
So, a Learning Network is ...

A *group* of distributed persons:

- connected to each other in a *social* sense
- connected to each other in a *technical* sense
- connected to relevant distributed *learning resources*
- connected to each other in order to *learn* from & with each other

✔ as independent as possible of constraints like: location, institution, job, time, specific technologies
✔ persistent over time to support lifelong learning in a certain field
Key issues

- Put the lifelong learner center stage
- Support for formal education, non-formal (further) education and training, informal education and informal learning
- Support for *learning communities* with synchronous and asynchronous interaction
- Support learners with collaborative filtering techniques to *navigate* in the learning network
- Support learners to determine to assess their existing knowledge and to map this knowledge to a *position* in a learning network
- Provide user-friendly tools to make, use and reuse *learning resources*
- Decrease the *workload* of teachers and learners
- Use and develop *open standards* to create the connections in the LN and to define the minimum requirements of the LN
Programme themes

1. Learning Networks Integrated
   Overall functionality, use-cases, models & infra

2. Make & Use Activities Nodes in Learning Networks
   How to Make and Use Activity Nodes in Learning Networks

3. Learner Positioning in Learning Networks
   How to position new and existing learners in a Learning Network (e.g. measure and map existing competencies)

4. Navigation in Learning Networks
   How to navigate in Learning Networks, using & exchanging learning tracks, learning routes and learning patterns in Learning Networks
Approach

- Educational Modelling
- Infra & Tools
- Use, Evaluation & Dissemination

Outcomes:
1. Publications
2. Open Source Prototypes
3. Open Specifications

All outcomes in:
http://dspace.ou.nl
Educational Modelling

Major Model Requirements:

- Formal, semantic, abstract, interoperable, and computer interpretable model of an educational (sub) system
- Model describes structure & process
- In line with:
  - Pedagogical models & theories
  - Pedagogical Patterns
  - Best practices
- In line with existing open standards & specifications
Educational Modelling

MODELS:
- Units of Learning (EML, IMS Learning Design)
- Assessment / Testing
- Curriculum / Route planning
- Portfolio's & Learner Positions
- Learning Networks (integrates previous models)
- Learning Design Patterns (E-LEN)
IMS Learning Design
Part of Testing Model
Part of High Level LN Architecture
Special Issue BJET (Nov. 2004)

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British Journal of Educational Technology
Published on behalf of the British Educational Communications and Technology Agency

November 2004 - Volume 35 Issue 5 Page 675-759

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Editorial

675 Editorial: Technology and Lifelong Learning
Rob Koper
Online publication date: 29-Oct-2004

Articles

679 Interaction for lifelong learning
Norm Friesen, Terry Anderson
Online publication date: 29-Oct-2004
Infra & Tools

Educational Modelling

Infra & Tools

Use, Evaluation & Dissemination

- CopperCore (open source LD engine)
- Authoring & Players for LD (e.g. Alfanet)
- Application profiles and conformance tests for LD (Telcert)
- Simulation of Learning Network
- Learning Network Architecture & Infra
- Collaborative Filtering for Navigation
- Agent technologies for teacher & learner support
- Latent Semantic Analysis for learner positioning
Activity Diagram of Spanish Course

Teacher:
- Act I
  - Show Scene
  - Assign Students
  - Act II
    - no activity
    - Review Key
    - Write Outline
    - Create Conversation
  - Act III
    - Feedback
    - Check with teacher

Learner:
- no activity
- no activity
- no activity
**Technological Development Methodology - Activities - Groove**

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<td>Learner</td>
<td>Exercise: define TD questions and problems</td>
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<td>Core</td>
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<td>RK</td>
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<tr>
<td>Activity</td>
<td>Learner</td>
<td>Exercise: generic article</td>
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<td>Core</td>
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<td>RK</td>
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</table>

**Learning objective**

Basic knowledge Technology Development

**Prerequisites**

Basic knowledge of research approaches

- First read the Zulkardi summary of developmental research ([listofresources](#)).
- Then, study the article about Developmental Research from Ritchey & Nelson (1996) ([developmentalresearch.pdf](#)). Try to concentrate on aspects related to technology development (developmental research is only a subset of technology development: what aspects are missing?).
- Then, study the other articles in **Methodology** like descriptive research, qualitative research, etc.
- Another aspect of Technology Development is the methodology of the development of new prototypical tools. One possibility is to use the methods for the development of software (like the **Unified Process**). However, in our situation we will use the experimental, performance, etc.

**Methodology from Jonassen** (see also: Summaries)
Recent Book about LD (2005)

Learning Design

E-learning is still in its infancy. This can be seen in the book. In the limited pedagogical quality and lack of portability of e-learning content, and in the lack of user-friendly tools to exploit the opportunities created by current technologies. To be successful, e-learning must offer effective and attractive courses and programmes to learners, while at the same time providing a pleasant and effective work environment for staff members and the ability to develop course materials, plan the learning process, provide tutoring, and assess performance.

To overcome these deficiencies, the IMS Global Learning Consortium Inc. released the Learning Design Specification in 2000. While learning design is impossible to advance and present advances, it must include a learning culture embracing educational and game-playing methods, problem-based learning, learning community approaches, adaptivity and peer coaching and assessment methods.

Rob Koper
Colin Tattersall (Eds.)

Learning Design
A Handbook on Modeling and Delivering Networked Education and Training

ISBN 3-540-22814-4

springeronline.com
Approach

- Initial LN pilots with peer-to-peer infra
- Pilot: Learning Network for Learning Design (ln4ld.learningnetworks.org)
- Unfold project: building European communities for the support of IMS Learning Design
- Telcert LD demonstrators
- “Standardization” and dissimination activities in: IMS, CEN/ISSS, NEN, SURF SIX, Valkenburg Group, ...
LN4LD Pilot Architecture

LN Layer; technology= PHP-Nuke

LN4LD

AnotherLN

AN Layer: various technologies

Moodle

LD Player

Blackboard
Moodle Activity Nodes

1. Topic List
   - How to modify a Unit of Learning
   - IMS Learning Design and Metadata
   - Getting started with the IMS LD Specification
   - Understanding the basics of IMS Learning Design
   - Experience a representative collection of running Units of Learning

2. Scheduled Events
   - UNFOLD session at the EADTU 2004 conference

3. Previous Events

Search courses
This AN will consist of three assignments:

1. Read and understand the use case description and formalization in LD
2. Modify parts of the formalization by adding an extra activity
3. Modify the formalization by changing the activity sequence or structure

As an example of LD modelling at level A, the Boeing Use Case (training for the replacement of a fuel valve in an aircraft's wing) was taken as starting point and further simplified. (The Boeing Use Case is one of the examples used in the IMS Learning Design Best Practice and Implementation Guide.)

### 1 Understanding the Boeing simplified use case

The original Boeing use case contains a complicated testing procedure which demands the use of conditions and properties, only defined at IMS Learning Design Level B. In the first part, we have therefore left this procedure out, in order to be able to illustrate the design of a Level A instance document. Start by reading the use case description.

- Boeing Use Case

### 2 Follow the guided tour through the use case formalization process

The creation of a learning design typically is an iterative process, in which one leaps forward and back tracks according to one's personal preferences, the specifics of the use case and one's experience. For the inexperienced, the order suggested here will at least work. UML diagrams primarily are meant to provide an overview and a shared visual insight into complex flows of activities, and secondarily they are an exact way to formally model these flows.

- First read the procedure to move from a narrative to a UML activity diagram.
- Then read the procedure on moving from a UML activity diagram to the XML document instance.
- Finally, take a look at the resulting XML document instance, immanifest.xml

- Narrative-to-Activity-Diagram Procedure
- Activity-Diagram-to-XML-document procedure
- immanifest.xml
- Discussion of guided tour

### 3 Modify parts of the document instance

This activity involves modifying the learning design described above. In order to keep the activity manageable, we will only use part of the design, the Fuel Valve Removal Procedure. Click on the link to view the immanifest.xml file.
Thank You!

References:

- [http://dspace.ou.nl](http://dspace.ou.nl) (publications, preprints, software)
- [http://www.unfold-project.net](http://www.unfold-project.net)
- [http://ln4ld.learningnetworks.org](http://ln4ld.learningnetworks.org)