Learning Design
Past, present and future:
Questions & Challenges

Colin Tattersall
The Open University of the Netherlands

TEN Competence

Building The European Network for Lifelong Competence Development

Overview

- A little history
- Where we are today
- Looking to the future

![TEN Competence logo]
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Open University NL

- First student in September **1984**
- Government-funded institute for **distance learning at university level**.
- Goal: to make higher education accessible to anyone with the necessary aptitudes and interests, regardless of formal qualifications.
  – to create a cost-effective form of higher education,
  – to encourage innovation in Dutch higher education, in terms of both curriculum and teaching methods,
  – to reduce the teacher shortage in Dutch primary and secondary schools, and
  – to be a recognized player in distance and e-learning training programmes and consultancy.

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OUNL: some facts & figures

staff members	791
active students	21,004
student profile	49% female - 51% male age 18-26: 10% - age 26-35: 36% - age 36-45: 33% - above 45: 21% 44% has a paid job of 35 to 40 hours per week
study centres	12 study centres in the Netherlands 6 study centres in Belgium
electronic learning environment	20,539 students and alumni make use of Studienet (98%)
bachelor programmes	6
master programmes	13
academic courses	416
course enrolments	52,961
course certificates in 2003	26,611

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Three key historical points

- Early use of e-learning
  - web sites supporting courses, email, forums
  - Heterogeneous e-learning systems landscape
- Interest in educational theories
  - Competence based learning, problem based learning
- Funded task of innovating in education

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Rationale

- More to e-learning than what you can do with a Virtual Learning Environment (VLE)
- More to e-learning than learning objects
- Educational theories can help e-learning
  - Eg Social Constructivism
- Need to avoid additional burden on teachers and staff
- Need to support cooperation between institutions on developing courses

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Analysis of learning situations

- Large variety of *learning activities*
- Large variety of *learning environments* (generic, task
- specific)
- Sometimes *individual*, sometimes *group* interactions
- In most situations some kind of *support* (teachers, tools)
- Sometimes *self-directed*, sometimes *teacher directed*
- When appropriate, using *computers* and other new *technologies*

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The Quest

- Can we *describe* these learning events in a generic way?
- Can we make a *generic description* of all
  - the learning & support activities,
  - including the environment in which they take place?
- => search for a **notation** of the teaching-learning process in a Unit of Learning (e.g. a course, workshop, event, ...)

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What would the quest lead to?

- **Basis for the next generation of e-learning systems**: increasing the 'richness' of different learning activities

- Should bring **new** more effective, efficient & attractive **learning models** (active learning, problem based, ...)

- **Integrate** the large number of isolated existing standards (LOM, CP, QTI, RCD, LIP, ..) to create executable and interoperable units of learning ('courses')

- Support automation of the **workflow** in the teaching/learning process to decrease workload (especially of teachers)

- Every other advantage that a **standard notation** brings: reflection, communication, sharing, reuse, research, similarity studies, evaluation, etc.

1998 - 2003

OpenUniversiteitNederland
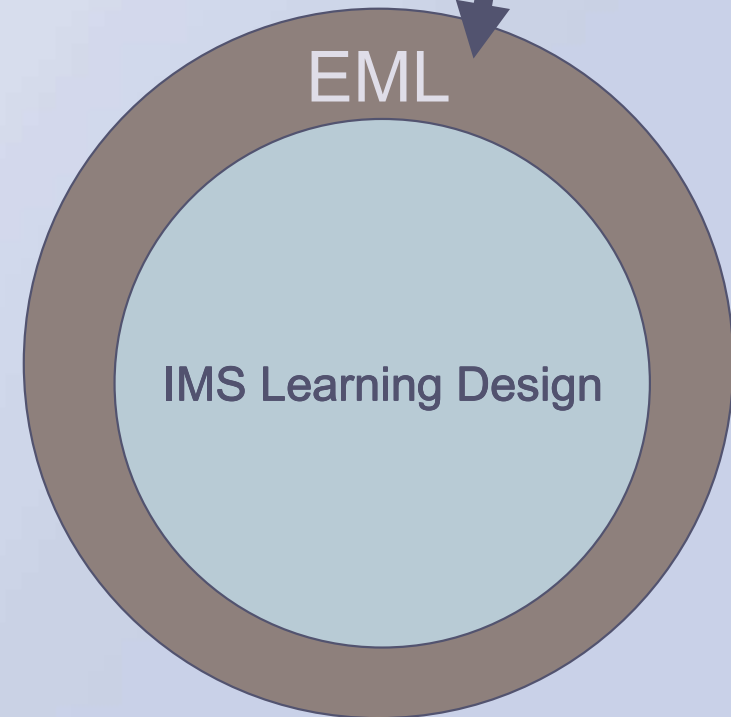
EML

2000

Educational Modelling Language
XML Notation for Units of Learning

<unit-of-learning>
  </objectives>
    </roles>
      </activities>
        </environments>
          </method>
</unit-of-learning/>

Edubox

EML Runtime Environment
version 1, 2, 3

EML
Educational Modelling Language

2000

IMS (CEN/ISSS)

2003

IMS LD

Information Model
Best Practice Guide
Binding

Assessments, interactions, content, …

EML

IMS Learning Design

OK, you said you wanted a notation

```xml
<imsld:play identifier="P-1" isvisible="true">
    <imsld:title>A unit of learning on the concept of greatness</imsld:title>
    <imsld:act identifier="A-1">
        <imsld:title>Your views on greatness</imsld:title>
        <imsld:role-part identifier="RP-Learner-1">
            <imsld:title>First step</imsld:title>
            <imsld:role-ref ref="Learner"/>
            <imsld:activity-structure-ref ref="AS-first-step"/>
        </imsld:role-part>
        <imsld:role-part identifier="RP-Tutor-1">
            <imsld:title>Support activities for first step</imsld:title>
            <imsld:role-ref ref="Tutor"/>
            <imsld:support-activity-ref ref="SA-first-step"/>
        </imsld:role-part>
        <imsld:complete-act>
            <imsld:when-role-part-completed ref="RP-Tutor-1"/>
        </imsld:complete-act>
    </imsld:act>
    <imsld:act identifier="A-2">
        <imsld:title>Others' views on greatness</imsld:title>
        <imsld:role-part identifier="RP-Learner-2">
            <imsld:title>Second step</imsld:title>
            <imsld:role-ref ref="Learner"/>
            <imsld:activity-structure-ref ref="AS-second-step"/>
        </imsld:role-part>
        <imsld:role-part identifier="RP-Tutor-2">
            <imsld:title>Support activities for second step</imsld:title>
            <imsld:role-ref ref="Tutor"/>
            <imsld:support-activity-ref ref="SA-respond"/>
        </imsld:role-part>
        <imsld:complete-act>
            <imsld:when-role-part-completed ref="RP-Tutor-2"/>
        </imsld:complete-act>
    </imsld:act>
    <imsld:complete-play>
        <imsld:when-last-act-completed/>
    </imsld:complete-play>
</imsld:play>
```

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We have a notation

- And it's at the heart of an **open technical specification**
- But doesn't tell us
  - how to record/create the notation
  - how to adapt/edit the notation
  - how to aggregate several notations
  - how to use the notation
- More work needed

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Beyond the notation

- Significant attention up to now given to the notation
  - Needed to help community understand the nature of the spec.
  - Needed to get some basic infrastructure in place
- Now need to build on these first steps …

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Road Map for Learning Design

- Specification (febr. 2003)
- Awareness raising (febr. 2004)
- First generation tools (febr.2005)
- Demonstrators & usability improvement of tools, application profiles and conformance testing (during 2005)
- Development of community of users (2005/2006)
- Pilots, experiments, production use (2006/2007)

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- **Where we are today**
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Publications

– 'Learning Design' book from Springer
– Special Issue Journal of Interactive Media in Education on Learning Design (Dec. 2005)
– Special Issue IEEE Educational Technology & Society, Jan. 2006 on Learning Design
– Lots of journal and conference articles

Explanations

– Preprints of articles & presentations at dspace.ou.nl

– Community facilities on moodle.learningnetworks.org

Examples

Date of Issue	Title	Authors
Feb-2005	Become a writer	Grives, Helen
Feb-2005	Brainstorming lost in the Moon	Hernández-Leo, Davinia
May-2005	Caminatas	Burgos, Daniel
27-May-2005	Caminatas I	Burgos, Daniel
2004	Candidas, the great unknown (I)	Burgos, Daniel
2005	Candidas. The Great Unknown (II)	Burgos, Daniel
Feb-2005	Endolab	Langewis, Elly
21-Jun-2005	Free style assesment	Burgos, Daniel
2004	From Lesson Plan to LD (Level A)	Koper, Rob
2004	From Lesson Plan to LD (Level B)	Koper, Rob
21-Jun-2005	Geo-Quiz 1	Burgos, Daniel
21-Jun-2005	Geo-Quiz 2	Burgos, Daniel; Tattersall, Colin
6-Jul-2005	Geo-Quiz 3	Burgos, Daniel
2004	Hello World	Tattersall, Colin
16-Feb-2005	IMS Learning Design Level 0	Burgos, Daniel; Berbegal, Nidia
2005	IMS Learning Design Level 0 (HTML)	Burgos, Daniel; Berbegal, Nidia
21-Jun-2005	Introduction to Level C	Burgos, Daniel; Vogten, Hubert; Koper, Rob
2004	Learning Activities With Conditions	O'Neill, Owen
21-Jun-2005	Learning to listen to Jazz	Tattersall, Colin; Burgos, Daniel
2005	Programmed Instruction	Tattersall, Colin; O'Neill, Owen
5-Jan-2006	Programmed Instruction with QTI	Tattersall, Colin; ONeill, Owen; Martens, Harrie; Vogten, Hubert

Via   moodle.learningnetworks.org
And
           dspace.learningnetworks.org

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Various projects

- EU
  - UNFOLD (2003-2005)
  - **TENCompetence** (2005-2009)
  - ProLearn (2003-2007)
  - Cooper (2005-2007)
  - plus others
- JISC (UK)
  - Sled, Slide (2)
  - DLD

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Worldwide interest

- Spain, UK, Netherlands, Germany, Canada, Australia, …
- France!

IMS LD support in VLEs

- Ongoing R&D:
  - Moodle
  - dotLRN
  - ATutor

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LD-aware tooling

- Reload editor
- CopperCore engine
- Players
  - Basic player (included with CopperCore)
  - Reload player
  - Sled player
- Basis for an integrated infrastructure ....

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CopperCore Service Integration
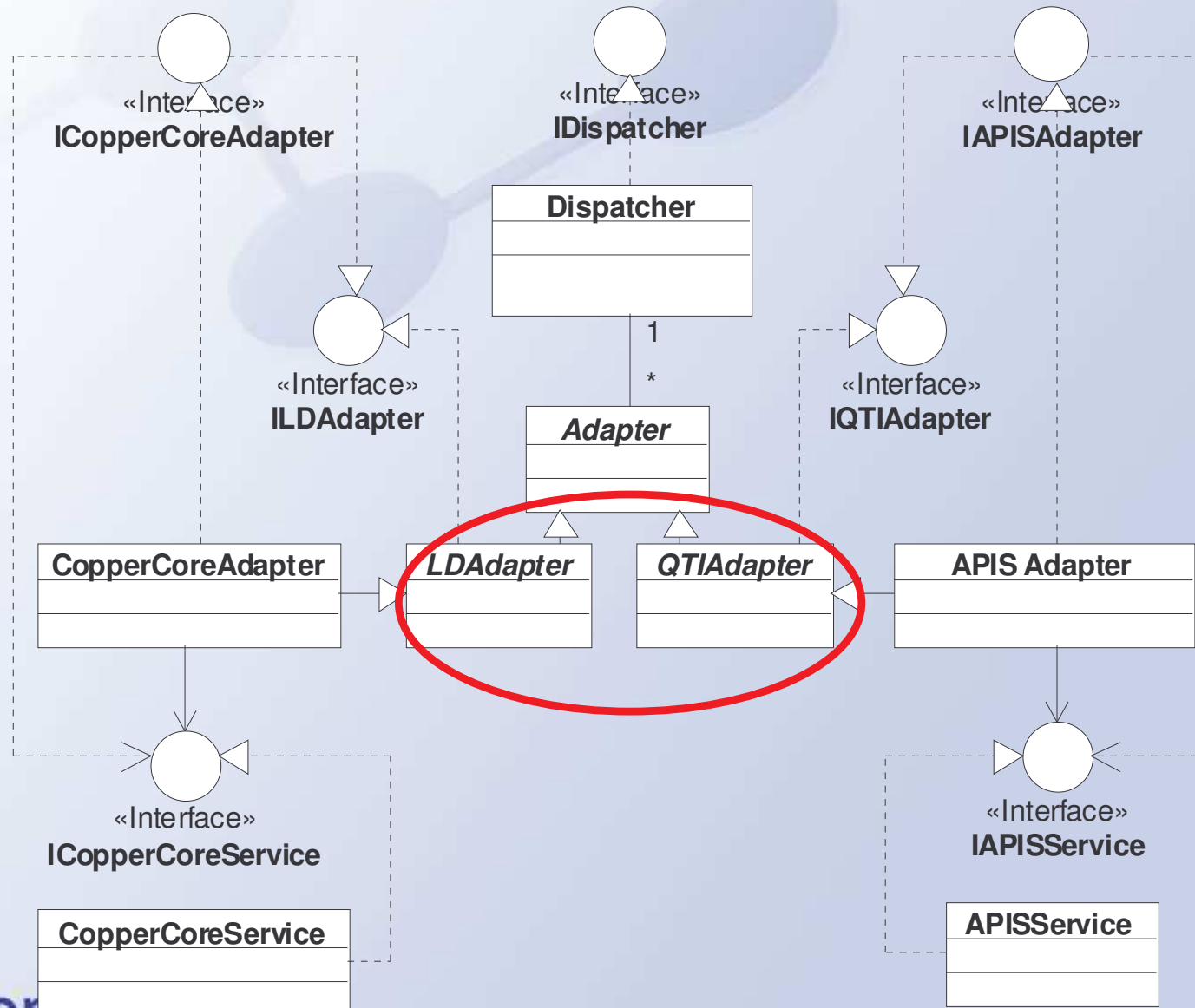
Service Based Learning Design Player (Sled) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back · Search Favorites

Address http://localhost:8080/sled2/Player.do?actId=section1&type=learning-activity&environments=   Go

Logged in as: hubert

Service Based Learning Design Player (Sled)

Menu

- Programmed Instruction with QTI
- Learning about Dutch food
- act
  - Activity Structure
  - Question 1

Question 1

What is a frikandel?

- ○ A type of vegan sushi
- ● A popular Dutch snack made from meat
- ○ Toxic waste

[ok]

Admin Pages

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Service Based Learning Design Player (Sled) - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back · Search Favorites

Address http://localhost:8080/sled2/QTIPost.do?item-identifier=question18url=http://localhost:8080/4/question1.xml   Go

Logged in as: hubert

Service Based Learning Design Player (Sled)

Menu

- Programmed Instruction with QTI
- Learning about Dutch food
- act
  - Activity Structure
  - Question 1
  - Question 2

Question 1

What is a frikandel?

- ○ A type of vegan sushi
- ● A popular Dutch snack made from meat
- ○ Toxic waste

Yes, that is correct.

[ok]

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Done   Trusted sites

Some experience

- Used with students/staff
  - Liverpool Hope University
  - University of Lausanne

- "Seems promising but it's a hell of a job"

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Where would we like to be?

- I would like to be helped in orchestrating high-quality e-learning arrangements
  - 'I' could be a teacher/tutor, Human resources manager, enthusiast, hobbyist, …
  - Want to be helped to knit together appropriate/proven combinations of services, content, group work, …. for my situation
  - Want to press a button and have it be delivered …

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Challenges …

- It's too hard to make UoLs with the current tools
    - We have editors for the notation; need design environments
    - (Visual) design languages/environments needed
    - Metaphors, critiquing systems, wizards, templates, drawing on pedagogical theories and e-learning practices
    - Different languages/design environments for different situations/user groups?
    - (Model-driven approach needed?)

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Challenges …

- We can't yet plug and play new runtime services
  - SCORM service, games, Google Earth, …
  - Easing this will also require more work on the previous challenge
    - Have to be able to design for integration
  - Model-driven approach?

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Challenges ...

- Lack of a library of complete, well-founded, field tested, cool examples
- Specific questions on the notation
  - Grouping in IMS LD
- Need to complete the toolset
  - General infrastructure needed (eg ePortfolio service, user/group service, …)
  - Specific LD Tools, eg to support runtime adaptation

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Challenges …

- Misconceptions on the nature of the spec/tooling
  - IMS LD doesn't compare very well with Virtual Learning Environment X
    - Like comparing HTML to Internet Explorer

  - System X is better for teachers because you can create courses in an easy way; to use IMS LD you have to deal with a lot of technical issues
    - We don't want teachers to know they are using IMS LD

  - Teachers don't need a design; they want to be able to be creative, modify on-the-fly
    - Clarify who wants to do what and whether an e-learning spec will help

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Three-pronged approach

- Continue research
- Continue engineering
- Continue dissemination

Areas to conduct work (1)

- Authoring environments & other tools for Learning Design
  - Learning Design Patterns (pedagogical 'components')
  - Graphical notation of learning designs
- Model-driven e-learning
  - Generating IMS LD as executable representation
- Learning Design and new forms of assessment
  - Formative assessment
  - Describing eAssessment processes
    - Peer assessment
    - 360-degrees feedback

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Areas to conduct work (2)

- Runtime & design time adaptations
  - Tools to modify an executing UoL
  - Mining runtime data
  - Comparing what worked & what didn't
  - Pattern recognition
- Runtime Collaborative Services integration
  - An (model-driven?) approach to integration of new services – wiki, blog, …
- Learning Design and the Personal Learning Environment (PLE)
  - Sharing undesigned paths described using IMS LD
  - Pattern recognition

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Cooperation

- ## Publications
  - Books, articles
- ## Seminars/workshops
- ## Partnering
  - TenCompetence Associate Partners
- ## New projects
  - French national projects?
  - Bi-lateral possibilities?
  - European?

Many thanks!

- And good luck this evening:

  France vs. Switzerland (18:00)