Understanding IMS Learning Design
How to Use and Implement IMS LD (December the 1st, 2004)

Jocelyn Manderveld, Colin Tattersall, Daniel Burgos
The Open University of The Netherlands
Educational Technology Expertise Centre
Overview

- 15:00 Welcome, introductions, workshop objectives
- 15:10 Part 1: Introduction to IMS Learning Design
- 16:15 Part 2a: IMS Learning Design in practice
- 16:45 Coffee
- 17:00 Part 2b: IMS Learning Design in practice
- 17:30 Part 3: Current developments and next steps
- 18:00 Close
Introductions

Colin Tattersall
- Background in Computer Science, Help Systems Research, XML, e-learning specifications;
- Involved in Learning Design spec., QTIv2

Jocelyn Manderveld
- Background in educational psychology, e-learning specifications, learning design
- Involved in IMS and SURF, involved in IMS LD
Introductions

Daniel Burgos
- Background in Education, Computer Science, e-learning specifications;
- Involved in UNFOLD, LN4LD
Objectives

To explain what the IMS Learning Design Specification is, why it was written and how you can make use of it.
Couple of preliminary remarks

- We won’t create XML files (although we will see some XML fragments)
- We will all collaborate in a running, pre-created learning experience then dissect its essentials
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A word on Learning Objects

- Units of Content
  - An animation of how a fridge works
  - A map of the middle east
  - An article on the occurrence of foot diseases in members of the Dutch Government

- The idea:
  - pick-and-mix these units from repositories to create or adapt an e-learning course which is then presented to the learner
<table>
<thead>
<tr>
<th>Title</th>
<th>Type</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Crisis at Fort Sumter</td>
<td>(Simulation)</td>
<td>&quot;Crisis at Fort Sumter&quot; is an interactive historical simulation and decision making program. Using: Location: <a href="http://www.mla.org/later/bk/">http://www.mla.org/later/bk/</a> Added: Mar 26, 2003</td>
</tr>
<tr>
<td>Ojala que llueve cafe</td>
<td>(Tutorial)</td>
<td>A guided-reading selection in Spanish based on a song by Dominican artist Juan Luis Guerra, optional...</td>
</tr>
</tbody>
</table>
From Learning Objects to Learning Activities

- What about situations in which learning happens without learning objects?
- What about when several learners cooperate to solve a problem?
- Where are the teachers and staff?

- Need a way of describing the whole teaching-learning process, not just the learning objects involved
  - pedagogy, *the act or process of teaching*

- IMS Learning Design: Interoperability of e-learning content & processes
History: Educational Modelling Language

- Language for describing **Units of Learning**
  - All the content and processes needed in learning something
- Developed by OUNL in the late nineties
  - Specification made generally available December 2000
- Brought into the standardisation process via IMS in 2001
- Approved as IMS Learning Design 1.0 on February the 10th 2003
  - EML no longer maintained or updated
  - EML and IMS Learning Design are very similar, though there are some differences …
Two versions of EML: 1.0 & 1.1

EML and IMS Learning Design

Assessments, interactions, content, ...
What IMS LD is **not** ….

- Not a programming language
  - … *although some characteristics are shared*
- Not an instructional method
  - … *can be used to describe many methods*
- Not pedagogically neutral in the sense of not caring about pedagogy
  - … *rather it requires the designer to be explicit about his/her pedagogical choices in the learning process*
- Not a guarantee of good education
  - … *can use it to describe poor learning processes*
What is IMS LD then?

- IMS Learning Design is used to model units of learning
  - A unit of learning (UoL) is any delimited piece of education or training, such as a course, a module, a lesson, etc.
  - more than just a collection of ordered resources to learn
  - activities, assessments, services and support facilities provided by teachers, trainers and other staff members.

- Who does what, when, with whom and using which learning objects and services?

- A model of the activities, content, tools and workflow for learners and staff to accomplish one or more learning objectives
What’s a model and what use is it?

- Learning processes are described (who does what, when, etc) using the concepts in the IMS LD language;
  - For example, we can create a model of problem based learning
- These models are ‘played’ in an IMS-LD-aware player;
  - Analogous to marking-up learning materials in HTML and having a browser interpret them
- Interoperability of e-learning processes

- (In fact, the IMS LD language is itself a model, but at a more abstract level: a meta-model)
Playing a model: Specific learners in particular roles carrying out activities....
IMS Learning Design meta-model

- Stage-play metaphor

  - People act in different **roles**
  - working towards certain **objectives**
  - by performing **learning and/or support activities**
  - within an **environment**, consisting of **learning objects and services** used in the performance of the activities.

- or, if you speak UML …
IMS Learning Design meta-model
Method

Act 1 ➔ Act 2 ➔ Act 3 ➔ Act 4 ➔ Act 5

Role-part 1
Role-part 2
Role-part 4
Role-part 5

Role ➔ Activity ➔ Environment

Activity-Description

Learning objects
Learning services

Components

with thanks to Bill Olivier of CETIS
© 2004
Zooming in on IMS LD: The Levels

- Level A: Core concepts:
  - Roles, activities, environments, method
- Level B: Adds
  - Properties and Conditions
- Level C: Adds
  - Notifications

- The levels help when teaching about IMS LD & help tool developers in delivering incrementally, but should not get in the way;
Level A core concepts

- **Components**
  - Roles
    - Eg Learner, Tutor, Mentor, Facilitator, …
  - Learning/Support activities
    - What has to be performed
  - Activity structure
    - Sometimes activities need to be carried out in a *specified order* or the learner may *choose* what to do.
- **Environment**
  - Materials might be needed to perform an activity
  - The learner might need to communicate with others
- **Method**
  - Play, Act, Role-Part
Method

… then orchestrate their interplay

Act 1 → Act 2 → Act 3 → Act 4 → Act 5

Role-part 1
Role-part 2
Role-part 4
Role-part 5

Set up these constructs …

Role → Activity → Environment

Activity

Activity Description

Environment

Learning objects
Learning services

Components

with thanks to Bill Olivier of CETIS
Plays & Acts

- IMS LD has various mechanisms to help with the ordering (or sequencing) of content
- In the method element of the learning-design element of a Unit of Learning, the play element is used to order a series of acts
- Acts are used to create synchronisation points for learners involved in various roles
Roles, Activities and Role Parts

- Each act (in a sequence of acts) specifies which role-parts are active (concurrently)
- A role-part:
  - links a role to an activity or an activity-structure
- An activity has an activity-description which refers to a resource (eg an XHTML file) contained in the resources section of the content package
Activity Structures: Sequences vs selections

- Do these activities in order
  - SEQUENCE

- Chose one of these alternatives
  - SELECTION number-to-select=1

- Do all (eg 4) of these activities but in any order
  - SELECTION
Activity Structures: Sequences vs Selections

Activity Structure: Sequence
- Learning Activity 1
- Learning Activity 2
- Learning Activity 3
- Learning Activity 4
- Learning Activity 5
- Learning Activity 6
- Learning Activity 7

Activity Structure: Selection
- Learning Activity 1
- Learning Activity 2
- Learning Activity 3
- Learning Activity 4
- Learning Activity 5

Activity Structure: Selection (number-to-select = 1)
- Learning Activity 3
- Learning Activity 4
- Learning Activity 5

Activity Structure: Selection (number-to-select = 2)
- Learning Activity 3
- Learning Activity 4
- Learning Activity 5
The environment

- Resources needed when performing an activity (support & learning)
- Learning Objects
  - Web pages
  - MS-Word document
  - Pictures
  - Videos
  - etc
- (Learning) Services
  - send-mail, conference, and index search
- Can also be linked to activity structure
- Can be nested
Completion

- Need to indicate under which conditions the flow “moves on”
- When/How does a Unit of Learning, a play, an act, an activity, finish?
  - Can be a time-limit, or …

  <complete-unit-of-learning>
  <when-play-completed ref="P-1"/>
  </complete-unit-of-learning>

  <complete-play>
  <when-last-act-completed/>
  </complete-play>

  <complete-act>
  <when-role-part-completed ref="RP-Tutor-2"/>
  </complete-act>

  <complete-activity>
  <user-choice/>
  </complete-activity>
One last point before levels B and C

- Can also add an on-completion element to give some feedback
  - Reference to a resource (eg XHTML file) in resources section
  - Could in turn reference sound, video, …
Levels – where are we?

- Level A
  - Components (roles, activities, environments, …)
  - Method (Play, acts, role-parts)
  - Completion

- You can do quite a lot with these elements, but certainly not everything you’d like to do
- However, adding just a few more elements opens many new doors
Open new doors by …

- Allowing the learning flow to be influenced not just by user-choice or time-limit but by other factors
- Allowing more sophisticated approaches to sequencing than provided by selection and sequence
Level B – properties

- Properties rather like variables in programming language
- Completion of activities, acts, etc can depend on properties
  - Only let this activity complete when these properties hold
- Completion of activities, acts, etc can influence properties
  - When this activity completes, set this property
Level B – properties

- There are different types of property
  - Local properties
  - Global properties
  - Personal properties
  - Role properties
- Not going to go into on this point in detail today
Level B – conditions

- If a certain situation holds, then show or hide something or change a property
- The latter may in turn trigger another condition to fire and show or hide or change etc
Level B – show and hide

- Various elements have an IsVisible attribute which can be modified using show and hide
- Can also be applied to the class attribute as in XHTML
Level C

- Notifications inform a role that something has happened
  - Via email
  - By setting a new activity
- Can trigger using on-completion
- Can trigger using then
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The design process
The learning design process (1)

- **Starting point is a narrative description of some educational process**
  - “Students are presented with some information on Italian Wines. The tutor is available to take questions …”
  - “The lecturer posts a problem on the bulletin board. Each group of learners elects a spokesperson who summarises the problem and clarifies …."
  - “Think about your experiences as a school child, creating three statements which should be typed into a document and stored on the shared space. Once this is done…..”
The learning design process (2)

- Once examples of the meta-model concepts have been identified, a slightly more formal representation can be created (e.g., a table listing the sequence of activities, split by role)

- OUUNL found UML activity diagrams to be helpful
  - Used in the IMS LD Best Practice and Implementation Guide, but use is not mandated
The learning design process (3)

- What’s next?
  - Say it with XML
- IMS LD has, in common with all IMS specs, a so-called XML binding
- If you represent your UoL in the data format indicated by the binding, a conforming application will be able to do the right thing
What’s the learning design process produce?

- An IMS Content Package
  - Used for exchange of content
- IMS Learning Design is integrated with an IMS Content Package as another kind of organization within the `<organizations>` element.
- An IMS content package is called a 'Unit of learning' if and only if it includes a valid IMS learning-design element in the organizations part of the package's manifest.
LD and CP

PACKAGE

Manifest
  Meta-data
  Organizations:Organization
  Resources:Resource
  (sub)Manifest

Physical Files
  The actual content: HTML, Media, Activity descriptions, Collaboration and other files

Unit of Learning

Manifest
  Meta-data
  Organizations:Learning Design
  Resources:Resource
  (sub)Manifest

Physical Files
  The actual content: HTML, Media, Activity descriptions, Collaboration and other files
The wider context

IMS LD acts an integrative, orchestrating layer, and typically involves more than just IMS LD (eg IMS CP+MD+LD+QTI+XHTML)

Designers create Units of Learning containing IMS LD, XHTML content, IMS QTI, ....

Learners (and staff) use an LD-aware software application in (a part of) their learning process

A content package
What do you need to use IMS LD?

1. A way of creating Units of Learning
2. A way of coupling an abstract Unit of Learning to specific learners (instantiating it in a “run”)
3. A way of playing the run so that learners/staff can experience the Unit of Learning
Architectural context (2)

- Authoring
- Repository
- Run tool
- Learner & Staff Administration
- Portal
- Learning services

Design time

Run time

Unit of Learning

Run
Case Study

- In order to reinforce the concepts introduced, we’ll take a example, see how it looks in a player, then see how it works
  - With thanks to James Dalziel (Macquarie ELearning Centre of Excellence) and the Alfanet project
What is Greatness

- Try to create a UML activity diagram for the following:
  - Students individually consider “what is greatness?”;
  - They enter a few sentences of initial thoughts;
  - This process is monitored and ended by the tutor;
  - All learners then see all responses (anonymous);
  - All learners then enter personal reflections on all responses (not made public);
  - The tutor receives all responses and personal reflections once they have been entered;
  - The tutor gives feedback on the responses and reflections and finishes the learning activity on a per learner basis.
Learner

- Introduction
- Enter initial thoughts
- Respond to others

Tutor

- Monitor the initial thoughts
- Respond to the initial thoughts
How might a run for this UoL look?

- Surf to

- You are all in the role of learner
- One of the presenters will act as the tutor
  - The session will be halted at various points to show you ‘what the tutor saw’
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So what does the UoL look like?

- We will step through parts of the UoL and highlight some of the most important constructs
- UoL is an IMS Content Package
  - zip file with imsmanifest.xml (containing a manifest containing an organisation containing a learning design)
  - Several other files used as resources
  - But all in all only 8Kb
Roles

<roles>
  <learner identifier="Learner">
    <title>Learner</title>
    <information>
      <title>The Learner role</title>
      <item identifierref="R-information-for-learner"/>
    </information>
  </learner>

  <staff identifier="Tutor">
    <title>Tutor</title>
    <information>
      <title>The Tutor role</title>
      <item identifierref="R-information-for-tutor"/>
    </information>
  </staff>
</roles>
Play, Act, Role-parts, Activity structures, Completion
Activity structures

<imsId:activity-structure identifier="AS-first-step" structure-type="sequence">
  <imsId:title>First steps in reflecting on greatness</imsId:title>
  <imsId:environment-ref ref="E-wig-general-environment"/>
  <imsId:learning-activity-ref ref="LA-introduction"/>
  <imsId:learning-activity-ref ref="LA-enter-initial-thoughts"/>
</imsId:activity-structure>

<imsId:activity-structure identifier="AS-second-step" structure-type="sequence">
  <imsId:title>What do others think?</imsId:title>
  <imsId:environment-ref ref="E-overview-thoughts"/>
  <imsId:environment-ref ref="E-response-by-tutor"/>
  <imsId:learning-activity-ref ref="LA-respond-to-others"/>
</imsId:activity-structure>
First steps in reflecting on greatness

Please enter your initial thoughts on greatness. Subsequently, your thoughts will be made available to the whole group, and you will be able to see the thoughts of others. You can find supportive material in the environment.
Learning Activities (1)

<imsId:learning-activity isvisible="true" identifier="LA-introduction">
  <imsId:title>Read the introductory text</imsId:title>
  <imsId:activity-description>
    <imsId:item identifier="l-introduction-a" identifierref="R-intro"/>
  </imsId:activity-description>
  <imsId:complete-activity>
    <imsId:user-choice/>
  </imsId:complete-activity>
</imsId:learning-activity>
<imsId:learning-activity isvisible="true" identifier="LA-introduction">
  <imsId:title>Read the introductory text</imsId:title>
  <imsId:activity-description>
    <imsId:item identifier="l-introduction-a" identifierref="R-intro"/>
  </imsId:activity-description>
  <imsId:complete-activity>
    <imsId:user-choice/>
  </imsId:complete-activity>
</imsId:learning-activity>
Learning Activities (2a)

This activity involves the learner entering thoughts ...

```xml
<imsId:learning-activity isvisible="true" identifier="LA-enter-initial-thoughts">
  <imsId:title>Enter your initial thoughts</imsId:title>
  <imsId:activity-description>
    <imsId:item identifier="l-enter-initial-thoughts" identifierref="R-initial-thoughts">
      <imsId:title>Consider "greatness" and note down your thoughts</imsId:title>
    </imsId:item>
  </imsId:activity-description>
  <imsId:complete-activity>
    <imsId:when-property-value-is-set>
      <imsId:property-ref ref="LP-activity-2-completed"/>
      <imsId:property-value>true</imsId:property-value>
    </imsId:when-property-value-is-set>
  </imsId:complete-activity>
</imsId:learning-activity>
```
Consider "greatness" and note down your thoughts.

Subsequently, your thoughts will be made available to the whole group, and you will be able to see the thoughts of others. You can find supportive material in the environment.

Greatness is when a human does something for the greater good of mankind.
Learning Activities (2b)

This activity involves the learner entering thoughts ...

This property set by the tutor who is monitoring how the group is doing ...
Support Activities

<imsId:support-activity identifier="SA-first-step" isvisible="true">
  <imsId:title>Monitor the learners' initial thoughts</imsId:title>
  <imsId:role-ref ref="Learner"/>
  <imsId:environment-ref ref="E-overview-thoughts"/>
  <imsId:activity-description>
    <imsId:item identifier="l-sa-first-step" identifierref="R-set-activity2-complete">
      <imsId:title>Set the activity to completed</imsId:title>
    </imsId:item>
  </imsId:activity-description>
  <imsId:complete-activity>
    <imsId:when-property-value-is-set>
      <imsId:property-ref ref="LP-activity-2-completed"/>
      <imsId:property-value>true</imsId:property-value>
    </imsId:when-property-value-is-set>
  </imsId:complete-activity>
</imsId:support-activity>
This learner had the following thoughts on greatness.

Greatness is when a human does something for the greater good of mankind.
### Monitor the learners' initial thoughts

Monitor the progress of the learners by using the overview of the entered thoughts and the progress overview in the environment. When all learners have entered their initial thoughts, set the activity to completed.

Complete the activity by setting this variable to true:

```html
<body>
  <div class="C-Activity2-not-complete">
    <p>Monitor the progress of the learners by using the overview of the entered thoughts and the progress overview in the environment. When all learners have entered their initial thoughts, set the activity to completed.</p>
  </div>
  <div class="C-Activity2-not-complete">
    <p>Complete the activity by setting this variable to true:</p>
    <input type="checkbox" checked="true" name="C-Activity2-complete" value="true" />
  </div>
</body>
```
How did the flow move on?

Monitor the progress of the learners by using the overview of the progress overview in the environment. When all learners have expressed their thoughts, set the activity to completed.

Complete the activity by setting this variable to true:}

```xml
<imsld:property-ref ref="LP-activity-2-completed"/>
<imsld:property-value>true</imsld:property-value>
```
How did the flow move on?
New Act available

Activities in previous act affected by this change using SHOW and HIDE in CONDITIONS

Enter your initial thoughts

You entered these initial thoughts:

Greatness is when a human does something for the greater good of mankind.

The activity has now been completed by the tutor for the whole group.
Learners able to view others’ thoughts using Monitor service in environment ...
Respond to the thoughts of others

Your initial thoughts on greatness were:

**Greatness is when a human does something for the greater good of mankind.**

Take a look at what others think about greatness using the monitor service in the environment. Use this information to revise your thoughts in the area below. The tutor will finish off this activity on a learner-by-learner basis.

Well, after seeing what others thought, I have decided to revise my opinion.

... and respond to these thoughts
Tutor able to view initial thoughts and response for each learner

Then set to completed for each learner which completes the second act and the play
What aspects of IMS LD did we see?

- Multiple roles
- Collaboration
- A learning service
- Properties
- Completion rules
- Conditions
- Showing and Hiding
- Global elements
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Current developments on IMS LD

- Tools
- Projects
- Upcoming events
- Additional information and links
Learning Designers CoP

Welcome to the Learning Designers Community of Practice

This Community of Practice is intended to help you find and exchange information and experiences about making educational designs with IMS-LD. You will find several courses and various resources (software, manuals, articles...) for Learning Designers here.

NEW: PREVIEW ON RUNNABLE LD EXAMPLES

From November 16 till December 14, 2004 we carry out a trial that offers you the possibility to preview some concrete and runnable examples of units of learning (UoL) modeled in Learning Design. Currently we provide three runnable examples and others soon after. You will be the first to view and experience these UoLs that will become publicly available for the (UNFOLD) community from early 2005 onwards. Please, go to the section "Courses, Examples and Activities" inside "Learning Designers CoP" or click here.

How to join: If you are new to UNFOLD, follow the link to become a member at the bottom left of the screen, or join to the top right.

If you are already a member of another UNFOLD Community of Practice, and would like to join this one as well, please send a message to Rei Griffiths, as Administrator of this website.

You can also access directly to several Activity Nodes in OUNL's Learning Network for Learning Design following this link.
Learning Networks for Learning Design
http://moodle.learningnetworks.org

Activity Nodes
- Courses
- Example Units of Learning
- Activities and events

Getting started with the IMS LD Specification
Runnable LD Examples
- Understanding the basics of IMS Learning Design
- How to modify a Unit of Learning
- Experience a running Unit of Learning
- IMS Learning Design and Metadata
- UNFOLD session at the EADTU 2004 conference
- UNFOLD presence at the Online Educa Berlin 2004
- Change Proposals IMS LD Specification

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Learning Networks for Learning Design

http://moodle.learningnetworks.org

This activity node contains a number of example Units of Learning (i.e. IMS Content Packages which have a learning design and all associated resources) together with some explanatory material. The Units of Learning can be run in CopperCore.

This facility is a pre-release of parts the UNFOLD examples set. The set is being made available early to those participants who have accumulated at least 33 points through posting, replying and rating in LN4LD. The pre-release period runs from November 16th 2004 to December the 14th 2004. Currently we provide three runnable examples and others soon after. The UNFOLD example set will be publicly available in early 2005.

You need to read first the following documents in order to install required components properly and for a generic run of the Example Units of Learning:

- Step by step: How to install CopperCore Runtime and required components
- Step by step: How to publish an Example Unit of Learning
- Step by step: How to run an Example Unit of Learning
- Step by step: How to exit

Example 1: Hello World

Level A. This is a very simple learning design containing one role, one learning activity and a single resource provided in an environment. It is designed to give a simple hands-on introduction to learning design. It is a Learning Design Level A example.
TELCERT: Technology Enhanced Learning Conformance - European Requirements and Testing

TELCERT is a Technology Enhanced Learning research and development project under the European Union's 6th Framework programme. Led by a consortium of eLearning providers, research and industry organisations, TELCERT will develop innovative software testing and conformance systems to assure interoperability in eLearning content and technology.

Certification and testing are crucial to accelerating market take-up of innovative eLearning technologies based on specifications and standards. Yet new test technologies are needed to meet the diverse needs of suppliers and users in different learning environments and cultures.

At the heart of the technology, eLearning community requirements will be defined in application profiles, supported by profiling and content re-engineering tools. These will generate customised conformance tests and enable trusted product and content certification.

The TELCERT work programme includes:

- Identifying the 'state of the art' in testing & conformance
- Test suite research and development
- Creating application profiling and content re-engineering tools
- Developing the TELCERT TEST Suite and conformance programme
- Workshops, briefings and seminars for the eLearning Community
Alfanet: Active Learning for Adaptive Internet

- 5th Framework
- Using IMS Learning Design and other IMS specs
- LD Editor, for Levels A, B and C
- LD Player, for Levels A, B (and C expected in January 2005)
- Use CopperCore as engine and as a part of the Alfanet Player
Alfanet: Active Learning for Adaptive Internet
CopperCore
http://www.coppercore.org

- Open source IMS Learning Design engine capable of processing units of learning, Levels A, B and C.
- Hides complexity of IMS LD for developers wishing to incorporate IMS LD into their products.
- Does not provide any user interface. Not a stand alone product.
- Uses XML for data exchange with clients
  - XML format resembles IMS LD as closely as possible
- Uses properties as main data storage mechanism
CopperCore
http://www.coppercore.org

Introduction: What is Candidas?

What is Candidas
Candida albicans is an opportunistic yeast that normally inhabits the mouth, throat, intestines and genitourinary tract of most humans and is usually considered to be a normal part of the bowel flora (the organisms that coexist with us in our lower digestive tract). Its job is to recognize and destroy harmful bacteria. Without Candida albicans in our intestines we would be defenseless against many pathogenic bacteria. In a healthy person, Candida albicans is numered in millions.

It is controlled by a properly functioning immune system and “friendly” bacteria. However, if the number of “friendly” bacteria is decreased (antibiotics), the immune system is weakened or other conditions for yeast proliferation occur (diet high in sugar, improper pH in the digestive system) Candida albicans will shift from yeast to mycelial fungal form (start to invade the body). In the yeast state, Candida is a non-pathogenic, sugar-favoring organism, while in fungal state it is invasive and can produce filaments, very long root-like structures. Filaments can penetrate mucosa or intestinal walls, leaving microscopic
**CopperAuthor**: [http://www.copperauthor.org](http://www.copperauthor.org)

![Image of software interface](image_url)

<table>
<thead>
<tr>
<th>Type</th>
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<th>TagID</th>
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</thead>
<tbody>
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Other tooling developments

- Elive learning design suite
  - www.elive-ld.com/content/index_eng.html

- Chronotech
  - http://www.chronotech.nl

- Mot+
  - http://www.licef.teluq.uquebec.ca/fr/

- LAMS
Next events

Limburg, The Netherlands
16th-18th, February, 2005

Paris, France
March, 2005
Additional information

-“Learning Design. Modelling and implementing network-based education & training” (by the Valkenburg Group, Ed. Springer Verlag) Expected end of 2004
-“Learning Networks using Learning Design. A first collection of papers” (by OTEC, Open University of NL)
-Dspace, repository of IMS LD articles (by Open University of NL), http://dspace.ou.nl/index.jsp
-IMS, http://www.imsglobal.org
-Universitat Pompeu Fabra, http://www.upf.edu
-CETIS, http://www.cetis.ac.uk/
**SURF/SIX expertisegroep**

Dit is de website van de SURF SIX expertisegroep. Meer informatie over wat de expertisegroep doet, wat u ervan kunt verwachten en wie wij zijn kunt u lezen onder de knop *wat is SIX?*. Via de knop *aandachtgebieden* komt u bij de verschillende aandachtgebieden van de SURF SIX expertisegroep. Onder de knop *links* vindt u een overzicht van verschillende organisaties die actief zijn op het gebied van leer technologie standarden. De SURF SIX expertisegroep beschikt, naast deze website, over een discussieforum via de SURF mailtoevers. Aanmelden voor deze discussieforum kan via deze website.

**Data bijeenkomsten**

Plan deze data alvast in je agendal.
Op 7 december vindt EduExchange 2004 plaats. Je kunt je er nu voor inschrijven!

**Overzicht van de laatste nieuwsberichten op deze site.**

Hieronder staan de vijf meest recente nieuwsberichten. Een compleet overzicht met alle nieuwe berichten en reacties kunt u vinden onder het kopje *actueel* in het menu.

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**Boek** Leertecnologie in de Lage Landen

Het SURF SIX-boek "Leertecnologie in de Lage Landen" is nu beschikbaar!