

# UNFOLD Deliverable 7.3. UNFOLD outcomes 3

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# 1. Executive summary

This deliverable describes the work carried out with the UNFOLD Communities of Practice in the final six months of the project. The work undertaken corresponds to the activities of work-package 4 *Communities of Practice Facilitation*.

The deliverable summarizes the work done in two forms

- a description of project activities and outcomes relating to the Communities of Practice
- tabular presentation of all UNFOLD events and publications

In addition to the above, this deliverable includes annexes comprising reports on work undertaken by community members in the form of papers, articles, event reports (complete with URLs to presentation resources where applicable) and chat transcripts. This enables readers to obtain a quick overview of the work carried out.

The final six months of UNFOLD were marked by a relatively high workflow leading up to the impending finish date. Once again, a large number of events were organized including two Community of Practice meetings, four UNFOLD workshops and a further four events organized by other institutions in which UNFOLD participated. These face to face gatherings attracted participants from all over Europe and beyond. In addition, three online discussion events were organized and a number of forums were set up in parallel to enable further “offline” discussion of the chat topics. Additional resources were also added to the online resource base and forums were maintained and discussions encouraged.

As the project drew to a close the extent of the project’s success could be measured by the size of membership to the project websites which had risen to in excess of 1200 with more than 600 subscribed to the mailing list. Of these 1200 members, the academic sector, accounting for the majority, made significant contributions to the project outcomes. Participation from the industrial sector was equally impressive with representation from Cordys, .LRN and SchulCMS

Aside from the public activity engendered by the project there has been an ongoing effort to integrate IMS LD into Moodle and LAMS. This has resulted in the creation of two facilitated workgroups which were set up to manage work on the “Layer of services between the specification, LAMS and Moodle” and to resolve the problem of integration with Learning Design and Moodle.

All in all the project made significant progress in this final period with Community of Practice activities exceeding the number of events initially planned for in the project programme.

# 1. Overview of UNFOLD CoP activities and outcomes

## 1.1 Events

As the summer recess gave way to the start of a new academic year, the level of project activity increased. Two Community of Practice meetings were held in Glasgow and Berlin respectively, with the two day event in Germany officially bringing the project to an end. Both events were documented and reports posted to the UNFOLD website complete with presentations for the benefit of those who were unable to attend the meeting in person. Details of these events can be found in the following section and appendix of this report. The appendix also includes information on UNFOLD workshops and participation in other events which served to raise awareness of the project to novices in the field of Learning Design. Moreover, workshops such as those conducted in Rome (EUCEN) and Madrid (Universidad Complutense) provided a hands-on learning opportunity to the participants.

Four synchronous online events were also held during these six months the first of which featured a discussion in relation to the UNFOLD CoP meeting in Braga. The other three events featured discussions on particular topics including the JIME special issue on Learning Design, Moodle and IMS LD and a paper written by French researchers entitled: “Models for reuse of learning scenarios”. Transcripts of the discussions were posted to the Learning Networks site and forums were set up for further off line discussion of the topics raised. It should be pointed out that the forums did not enjoy the high level of success originally hoped for. Of the 29 threads initiated by the project facilitators there were only 84 responses.

Extensive personal email contacts were maintained with members, which led to a number of significant developments. This was particularly so in the involvement of industrial representatives in CoP meetings, in particular Cordys in Glasgow, and TheCode in Berlin. Another important focus of activity was around Open Source Virtual Learning Environments. Project staff participated actively in the moodle.org server, where strong interest had been shown in the use of Learning Design, following the participation Martin Dougiamas, the Lead Programmer of Moodle, at the Braga Communities of Practice meeting in June 2005. This led to the inclusion of a paper authored jointly by UNFOLD members and Moodle participants for the JIME special issue on Learning Design, August 2005. This activity was extended to the .LRN platform following contacts at the Genova Open Source 2005 conference, and led to the presentation of initial version of the .LRN Learning Design player at the Berlin event. Contacts were also maintained with key members of the Boddington community, who also attended UNFOLD events, and it is expected that this platform will also adopt Learning Design.

More formal outcomes were the formation of two working groups to work on the ‘Layer of services between IMS LD, LAMS and Moodle’ (Ernie Ghiglione, Daniel Burgos, Colin Tattersall, Rob Koper, Martin Dougiamas, Scott Wilson) and on ‘Integration between IMS LD and Moodle’ (Daniel Burgos, Martin Dougiamas, Rob Koper, Hubert Vogten, Colin Tattersall). The project also hosted and participated in the IMS working group for IMS Content Packaging, which is a key specification for IMS Learning Design.

### Exemplar Units of Learning

One new example Unit of Learning was developed to illustrate various aspects of the use of Learning Design and was added to the “Runnable units of learning” course on LN4LD, which includes learning materials for setting up the software required.

A total of 37 exemplar UoLs is now available in this course, including some developed by members of the project who have attended events

## **1.2 Publications**

The extent of the project activity for this period is also apparent in the number of publications produced. Over forty publications were generated during this last six month period of the project as the work carried out in the earlier periods bore fruit, and these are documented below. Other resources include a large number of electronic presentations used to support face to face meetings and workshops. Links to these can also be found below.

It should be noted that the resources referred to above and the meetings conducted as part of the project remit have all had a positive bearing on the attempt to familiarize people with the specification and to encourage its eventual adoption. One such effort includes the production of a hundred and thirty three page booklet which provides an introductory guide to the UNFOLD project, the specification and the project resources. The booklet is made up of contributions by project staff as well as non-project staff and its content can be said to be the cumulative result of project activity over the last two years. A total of 500 copies were published and distributed free of charge to partners and key CoP members for further distribution thus ensuring European wide circulation of the booklet.

Subsequent to the publication of the Springer-Verlag book on Learning Design (“Learning Design: A Handbook on Modeling and Delivering Networked Education and Training”) a special issue of the Journal of Interactive Media in Education featured a series of articles, sixteen in total, covering topics relating to Learning Design tools, ontologies, patterns and implementation of the specification. The special issue articles range from descriptions of completed work to accounts of new research programs and include contributions from France, Germany, Canada, the UK, Cuba, the Netherlands and Spain and many of the authors are actively engaged in the UNFOLD Communities of Practice.

## **1.3 CoP Membership**

The UNFOLD Communities of Practice have swelled to include over 600 subscribers to the UNFOLD mailing list. Whilst most participants are European, there is a small but noticeable number of members from countries as far a field as Australia, Canada, Russia and some North and sub-Saharan African nations among others.

The UNFOLD Learning Network for Learning Design site (LN4LD) hosts the learning activities, exemplar UoLs, transcripts of online discussions, and forums. Registered users of this site rose to 892. Members can register for these sites separately, so that they can choose if they want to be part of the mailing list or not. Taking into account individuals who subscribe to both UNFOLD services, there is a total of 1210 people involved in the Communities of Practice.

Whilst English is the predominant language of the UNFOLD project, it is interesting to note that additional, language-specific communities have established forums on the Learning Network site. The latest such addition is a Portuguese forum which complements the previously established Spanish and French community forums all of which attest to a growing interest in the project on the part of non-English speakers. However, the general level of activity in the UNFOLD forums remained relatively low throughout the last quarter of the project, in keeping with levels established during previous periods, as described in D10, the Communities of Practice report.

## **1.4 Infrastructure and Services**



During this period work was also undertaken to restructure the project websites to facilitate user resource searches with the result that the [ww.unfold-project.net](http://ww.unfold-project.net) site has become a portal for LD related information as well as the focus for subscription to the project mailing list. The list will be maintained indefinitely by the project partners. On the other hand, the Learning Networks site at [model.learningnetworks.org](http://model.learningnetworks.org) now hosts all online activities.

Members continued to receive information about IMS Learning Design via the UNFOLD mailing list which was used to send out news an average of once every fortnight. The mailing list remains in service at the close of the project and will continue to operate for an unlimited period. News items were also posted on the home page of the UNFOLD website on a more regular basis to relay up-to-date news to site visitors.

The Learning Networks DSpace server, hosted by the Open University of the Netherlands was adopted as the long term store for UNFOLD project outcomes and papers, as it provides a permanent and maintainable name space for documents, which guarantees sustainability.

## 1.5 CoP activities and outcomes

The activities of the individual Communities of Practice are summarized as follows:

**System Developers CoP:** Opportunities for productive exchanges have been afforded by the UNFOLD project as part its on-going effort to ensure good channels of communications between CoP members through regular meetings, chat sessions and email. However, as previously noted in D7.2 discussions between developers tended to take place in face to face contexts. It is worth noting that the face to face events organized by the project have allowed developers to present and demonstrate their work. The last two CoP meetings testify to this tendency with demonstrations of the pattern based COLLAGE LD editor, the Open University's SLeD LD player, the COW workflow system, .LRN and the Cordys Educator repository.

One of the more noteworthy achievements of the CoP includes the ongoing talks with Moodle and LAMS (Learning Activity Management System) for the provision of Learning Design interoperability in both systems. Furthermore the collaboration between UNFOLD and Moodle during both online and face to face events such as the Braga CoP meeting, led to the publication of an article written by Berggren et al (2005): "Practical and Pedagogical Issues for Teacher Adoption of IMS Learning Design Standards in Moodle LMS" in *Journal of Interactive Media on Education*, Special issue on "Learning Design". September 2005. Available at [<http://hdl.handle.net/1820/388>] and at [<http://www-jime.open.ac.uk/2005/01/>].

At the time of writing the community is exploring the possibility of integrating more services into the specification.

### Learning Designers CoP:

One of the main topics addressed by this CoP is focused on Learning Scenarios and re-use of Units of Learning. Along the last six months several discussions have taken place both, in face to face events and in online forums. For instance, at the UNFOLD CoP meetings in Braga and in Glasgow some active discussions stressed the need of an interoperable notation between systems capable to re-use learning designs in an easy way. Teachers' needs on re-purposing already modelled UoLs and using dynamic and open repositories are huge. Teacher become learning designers, while defining and building their online lesson plans, but also when they re-use their own material or others' one. The description of appropriate Learning Scenarios, actual real teaching-learning cases, that can be use and re-adapted is a hot issue to take care of from now on.

Several of the listed papers show this interest and active discussion, as well as some of the contributions to conferences provided by UNFOLD members. For instance, the one held in Complutense University where, along three intensive days working with teachers and learning designers, described and modelled learning scenarios based on blended learning; or the

workshop on IMS LD Level B at UNFOLD CoP in Glasgow, focused on adaptive learning UoLs.

### **Teaching and Learning Providers CoP**

A number of sessions focused on pedagogy were held during this period. In the Valkenburg public seminar the topic of the potential usefulness of pedagogic patterns within UoLs stimulated valuable discussions between veterans and newcomers. Davinia Herández Leo of the University of Valladolid presented progress on development of their template approach of collaborative learning flow patterns that can be integrated into authoring tools such as their own COLLAGE ([gsic.tel.uva.es/collage](http://gsic.tel.uva.es/collage)). Helge Holvike noted that our Web behaviour was changing from merely consuming to doing things, and César Olava de Moura of the University of Lille stated that patterns can provide LD with a collection of (best) practice in education that can guide designers when constructing UoLs. Francis Brouns of the OUNL discussed the potential and limitations of an inductive approach to IMS-LD patterns.

In a second strand, pedagogic expressiveness Ger Tieleman of Het Stedelijk Lyceum presented the way in which Moodle deals with learning design and hoped that usability of any LD player would rival its ease of use. Manuel Caeiro Rodriguez of the University of Vigo described a proposed model for evaluating the expressiveness and of LD based on activity theory. while David Bean and Leslie Richards of Waterloo University, Canada, described how they are implementing templates in IMS LD in as part of the LearningMapR application, which guides lecturers in improving their pedagogic practice.

In the Glasgow CoP meeting in the following month presentations the first day had a thread for teachers, and presentations were made by James Dalziel of LAMS (What do teachers want from Learning Design), and Peter Douglas (Developing a learning activity reference model), and Dai Griffiths (Sharing and collaborating with eLearning resources: why it is so hard, and what LD can do to help. On the final day there was a discussion led by Sarah Currier of JISC on pedagogic vocabularies, and a presentation from Mark Barret-Baxendale on use of IMS LD with learners at Liverpool Hope University.

These last two themes were picked up strongly in the final meeting, in Berlin, with an update and further discussion of the Liverpool Hope work, and a day long session specifically on vocabularies for Learning Design. The project was particularly pleased to have a presentation and participation from the Sue Bennett of the Centre for Research in Educational Technology (RILE), University of Wollongong Australia. She described the SMART learning design framework, which was very well received by members, and which lead to firm proposals for collaboration on IMS LD templates with some of the projects represented at the meeting. An extensive debate which clarified some of the barriers which have so far prevented a single unified vocabulary for learning activities being developed.

These face to face activities were supported by online activities, and particularly by the online discussions, including discussion of Moodle and IMS LD, which addressed pedagogic as well as systems development issues, and the discussion of the invited paper by Jean-Philippe Permin and Anne Lejeune of the CLIPS IMAG laboratory in Grenoble on *Models for reuse of learning scenarios*.

## **1.6 Participation from the industrial sector**

With the active participation of Cordys Educator at the Glasgow CoP meeting and the contributions made by the German based company theCode AG at the Berlin CoP meeting, there appeared to be increasing levels of interest in the project from industrial sectors during the last six months of the project. Of particular interest was the work undertaken by TheCode AG which has produced SchoolCMS a web-based authoring tool intended for the production of online courses with the ability to handle and export Level A compliant Learning Designs. Given their vested interest in Learning Design, theCode AG are keen to see the

development of Learning Design systems on a number of counts, not least the desire to produce a system complete with an integrated player capable of realizing the run of a UoL for users who are not necessarily conversant with the LD specification. During the course of their intervention in Berlin it was also revealed that the has introduced Learning Design into commercial product for schools, and would like to extend this to other areas.

## 2. Tabular summary of UNFOLD activities

Communities of Practice meetings				
Event	Start Date	Location	UNFOLD activity	URL
UNFOLD CoP meeting (3 days)	12-10-05	Glasgow	Undertanding the specification and using the tools	<a href="http://www.unfold-project.net/project/events/cops/glasgowcop/">http://www.unfold-project.net/project/events/cops/glasgowcop/</a>
UNFOLD CoP meeting (2 days)	31-12-05	Berlin	Next generation activity based eLearning	<a href="http://www.unfold-project.net/project/events/cops/berlin/">http://www.unfold-project.net/project/events/cops/berlin/</a>
UNFOLD workshops and panel sessions				
Event	Start Date	Location	UNFOLD activity	URL
UNFOLD/Prolearn	22-09-05	Valkenberg, Netherlands	UNFOLD Workshop	<a href="http://www.unfold-project.net/project/events/general/unoldfprolearn/summary.html">http://www.unfold-project.net/project/events/general/unoldfprolearn/summary.html</a>
SIGOSSEE/JOIN	14-11-05	Heerlen, Netherlands	UNFOLD Workshop	<a href="http://www.openconference.net/index.php?cf=3">http://www.openconference.net/index.php?cf=3</a>
EUCEN	18-11-05	Rome	UNFOLD Workshop	<a href="http://www.eucen.org/conferences/past/Roma/EUCENWeb/Programme.htm#2">http://www.eucen.org/conferences/past/Roma/EUCENWeb/Programme.htm#2</a>
Online Educa/UNFOLD	30-11-05	Berlin, Germany	UNFOLD Workshop	[ <a href="http://hdl.handle.net/1820/509">http://hdl.handle.net/1820/509</a> ]
TASELL	08-12-05	Dakar, Senegal	UNFOLD Workshop (with support of ILO)	<a href="http://zope0.itcilo.org/delta/2005/tasellao/home/info">http://zope0.itcilo.org/delta/2005/tasellao/home/info</a>
Uni. Complutense	12-12-05	Madrid	UNFOLD Workshop	<a href="http://moodle.learningnetworks.org/course/view.php?id=37">http://moodle.learningnetworks.org/course/view.php?id=37</a>
Participation in other events				
Event	Start Date	Location	UNFOLD activity	URL
Ecole thematique sur les EIAH	01-07-05	Autrans, France	Presentation on UNFOLD project	No link available
The 5 <sup>th</sup> IEEE International Conference on Advanced Learning Technologies	05-07-05	Taiwan	Keynote presentation	<a href="http://hdl.handle.net/1820/405">http://hdl.handle.net/1820/405</a>
Conference on Open Source Systems	14-07-05	Genova	Paper: Open Source and IMS Learning Design: Building the Infrastructure for eLearning.	<a href="http://www.unfold-project.net/documentation/other/presentations/oss2005/">http://www.unfold-project.net/documentation/other/presentations/oss2005/</a>
The 2nd Conference on "ODL interaction" : CEFETCE	25-08-05	Brazil	Presentation: UNFOLD Project: Accelerating the Adoption of IMS-LD".	No link available
SPDECE	19-10-05	Barcelona	Plenary presentation on UNFOLD and IMS-LD	<a href="http://www.uoc.edu/symposia/spdece05/">http://www.uoc.edu/symposia/spdece05/</a>
IMS Content Packaging Meeting	13-11-05	Heerlen, Netherlands	Organisation and hosting of IMS Content Packaging group meeting	No Link available
Lornet	15-11-05	Vancouver, Canada	Pre-conference tutorial and participation in symposium	
Online Educa	14-12-05	Berlin	Participation in workshop on UNFOLD contribution to reference models	<a href="http://www.online-educa.com/pre_conference/10.htm">http://www.online-educa.com/pre_conference/10.htm</a>
UNFOLD Online Events				

<b>Event</b>	<b>Date</b>	<b>Topic</b>	<b>URL</b>
UNFOLD seminar	06-07-05	Discussion of UNFOLD CoP Meeting in Braga,	<a href="http://moodle.learningnetworks.org/course/view.php?id=34">http://moodle.learningnetworks.org/course/view.php?id=34</a>
UNFOLD seminar	28-09-05	Discussion of JIME Special Issue on LD	<a href="http://moodle.learningnetworks.org/course/view.php?id=34">http://moodle.learningnetworks.org/course/view.php?id=34</a>
UNFOLD seminar	05-10-05	Moodle and IMS LD	<a href="http://moodle.learningnetworks.org/mod/forum/view.php?id=278">http://moodle.learningnetworks.org/mod/forum/view.php?id=278</a>
UNFOLD seminar	14-12-05	Discussion of paper: "Models of re-use"	<a href="http://moodle.learningnetworks.org/mod/resource/view.php?id=334">http://moodle.learningnetworks.org/mod/resource/view.php?id=334</a>

### 3. Publications

In the printed version of this report these publications are included as an appendix (with separate numbering) Readers of the electronic version of this report are invited to access the online versions using the links provided.

<b>UNFOLD publications for journals and conferences, January to December 2005</b>
<p><b>Berggren, Anders; Burgos, Daniel; Fontana, Josep M.; Hinkelman, Don; Hung, Vu; Hursh, Anthony; Tielemans, Ger.</b> (2005) <i>Practical and Pedagogical Issues for Teacher Adoption of IMS Learning Design Standards in Moodle LMS</i>. Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005  <a href="http://hdl.handle.net/1820/388">[http://hdl.handle.net/1820/388]</a></p>
<p><b>Berlanga, A., &amp; García, F.</b> (2005) <a href="#">IMS LD reusable elements for adaptive learning designs</a> Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<a href="http://www-jime.open.ac.uk/2005/11/berlanga-2005-11.pdf">http://www-jime.open.ac.uk/2005/11/berlanga-2005-11.pdf</a>]</p>
<p><b>Brouns, F., Koper, R., Manderveld, J., Van Bruggen, J., Sloep, P., Van Rosmalen, P., Tattersall, C. &amp; Vogten, H.</b> (2005) <a href="#">A first exploration of an inductive analysis approach for detecting learning design patterns</a> Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<a href="http://www-jime.open.ac.uk/2005/03/brouns-2005-03.pdf">http://www-jime.open.ac.uk/2005/03/brouns-2005-03.pdf</a>]</p>
<p><b>Brouns, F., Koper, R., Manderveld, J., Van Bruggen, J., Sloep, P., Van Rosmalen, P., Tattersall, C. &amp; Vogten, H.</b> (2005) <i>A first exploration of an inductive analysis approach for detecting learning design patterns</i>. Journal of Interactive Media in Education (Advances in Learning Design. Special Issue, eds. Colin Tattersall, Rob Koper), 2005/03 September 2005  <a href="http://hdl.handle.net/1820/437">[http://hdl.handle.net/1820/437]</a></p>
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In addition to the range of papers and articles published in the latter half of 2005, the project also spawned three relatively prolific publications in the form of a handbook on Learning Design which was indirectly influenced and supported by the project, an introductory booklet

on the project and the specification and one books of proceedings for a joint UNFOLD/ProLearn conference. These publications feature in the table below.

### UNFOLD – Proceedings and Booklets

*Burgos, D., Griffiths, D. (Eds.) (2005) The UNFOLD Project. Understanding and using Learning Design –December 2005* [<http://hdl.handle.net/1820/548>]

*Koper, R., Tattersall, C., Burgos, D.(Eds.) (2005) Current State on IMS Learning Design.* Proceedings of the UNFOLD/Prolearn joint workshop, Valkenburg, **September 22nd-23rd, 2005**. Heerlen: Open University of The Netherlands [<http://hdl.handle.net/1820/474>]

## 4. Online resources published on the Learning Network for Learning Design site

In addition to the many papers published on UNFOLD, the project has gone to considerable effort to facilitate the use of the specification by people who lack the necessary expertise. As a result a number of learning resources in the form of example units of learning have been published on the Learning Networks server. The examples by themselves would not be useful to non experts, and so they are supported by the learning activity *Runnable LD Example Units of Learning*, which in addition to links to the example Units of Learning (i.e. IMS Content Packages which have a learning design and all associated resources) also includes support for members in their use:

- a step by step guide to *How to install CopperCore and run and publish a UoL*
- an assignment: *20 instructions to run a specific Example UoL*
- a forum with full support on Example Units of Learning

Four new example Units of Learning were developed in this period to illustrate various aspects of the use of Learning Design and added to the “Runnable units of learning” course on LN4LD, which includes learning materials for setting up the software required. These were:

Name of UoL	Level of IMS LD	Purpose of the example
Geo-Quiz	Level B	Adaptive learning flow depending on user results
Quo Builder	Level B	personalization and adaptive learning flow depending on user results. 1 role
Quo Builder 2	Level B	, illustrating personalization, run-time tracking and adaptive learning flow depending on user results. 2 roles
Caminatas	Level A	Illustrating re-purposing of a generic game into a learning scenario modelled in IMS LD

A total of 37 exemplar UoLs is now available in this course, including some developed by members of the project who have attended events.

## 5. Conclusions

In this final period of the project the UNFOLD Communities of Practice were very active. There were a large number of events, including CoP meetings, a public conference, workshops and outreach activities at other projects and conferences. Four online events were also held.

The UNFOLD Communities of Practice have generated a substantial legacy of publications which will continue to be valuable to professionals and researchers in the coming years, together with the learning materials and exemplar Units of Learning. The final Community of Practice meeting produced an UNFOLD Berlin architecture for Learning Design which has already been taken up by the TENCompetence project as the starting point for its architecture.

The websites which support the Communities of Practice will be maintained by the project partners for the foreseeable future, and the mailing list will continue. Together with the interest from projects such as TENCompetence and PROLEARN in continuing UNFOLD activities there seems every reason to suppose that activities will continue in one form or another in the coming year. For a more detailed discussion of these issues, please see the deliverable D9, the Sustainability Plan.

## 6. Appendices

### 6.1 Reports on UNFOLD CoP meetings

## ***October 12<sup>th</sup> 13<sup>th</sup> 14<sup>th</sup>: CoPs meeting “Understanding the specification and using the tools” Glasgow,***

### **Day 1: Wednesday 12th October**

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#### ***Understanding the specification and using the tools.***

The focus of the first day was on understanding the specification and using the tools. To this end the opening session provided an outline of the specification and a brief hands-on workshop based around the RELOAD LD editor. This session ran parallel to a presentation by **Peter Douglas** of **Intralex** who presented the role of IMS LD in relation to work on the Learning Activity Reference Model that is currently being developed in conjunction with **LADIE**, a JISC funded project. The presentation focused on the ways in which different tools and services can work together and began with an introduction to the various partners and associated organisations involved in the LADIE project. To ensure all participants had the same understanding of the concept of reference models, the following definition was used

“ A reference model is an unambiguous means of sharing a common understanding of a precisely defined domain among people for whom the reference model definition may be the only point of contact.”

Having established this description, the presentation went on to delineate the limits in which the LADIE project operates distinguishing what it will do (deal with the management of learning activity and content sequencing in a single activity as well as looking at interoperable learning and content packaging within a Unit of learning) from what it will not do (sequencing learning activities into courses). To this end, the project is divided into two strands: Learning Activity Authoring and Learning Activity Realisation. Whilst the former deals with the design and construction of learning activities in relation to specifications, sequencing and content packaging, the latter focuses on the construction of the environment and the execution of learning activities within them.

An overview of the defining principles of LARM (Learning Activity Reference Model) followed along with a series of guides for specifications (APIs for developers, web service specifications etc.) implementation ( how to link up low level services with users and best practice guidelines for implementing web services) and pedagogy (an overview of eLF and LARM for teachers and practitioners and details of the abstraction of learning activities to a set of services). The presentation went on to point out the need for Learning Design within the model in order to allow the interoperability of pedagogic scenarios to ensure ease of exchange between teachers, but, given the technology that is currently available, it was conceded that the production of a reference model that met teacher’s needs would be difficult to put into operation.

The closing stages of the LADIE presentation gave an insight into the methodology of both a Top down and Bottom Up approach. The first approach includes the production of a

literature review followed by generation of uses cases with practitioners intended to capture practitioner's needs independent of the technology used. To this end, the Dialog Plus taxonomy has apparently been useful. The second approach is intended to review existing tools and standards and to define web services.

The presentation sparked a lot of useful discussion on the validity of a use case approach.

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**Dai Griffiths** of the UNFOLD project followed with his presentation "Sharing and collaborating with eLearning resources: why it is so hard, and what LD can do to help". The presentation began with a look at the need for social and community focus to encourage sharing and reuse of e-learning resources. Models of paper based sharing were considered as ways to share digital content. However, a number of problems were identified in relation to the electronic resource model that would lead to a bias towards programmed learning due to the lack of interoperability specifications, the difficulties in making and adapting materials and the danger of copyright infringement. Improvement in IT skills, better support in sharing, adapting and empowering teachers and learners and open specifications such as IMS LD were identified as being possible solutions. However, it was concluded that Learning Design could only be used effectively if the ways in which it would be used were clearly distinguished and if it acted on a number of pre-specified levels in tandem with other initiatives.

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James Dalziel's plenary session "What do teachers want from Learning Design?" started with an overview of LAMS and its gradual evolution and development principles details of which include the current integration with Moodle and Blackboard and possible future integration with WebCT and Sakai. Mention was also made of integration of IMS LD level and LAMS LD XML in the next major release of the system as well as a portfolio record feature that will keep a record of work done in LAMS. In answer to the leading question, it was suggested that Learning Design helps teachers to reflect on their practice and that the collaborative dimension that it promotes has proved motivating to learners. Moreover, whilst the use of the Learning Design does lead to a slight increase in workload, sharing among teachers is on the increase. Nevertheless, a change in culture is needed to encourage more widespread sharing.

A lengthy discussion followed on the value and merits of the LD tools that are currently available and the need for more teacher friendly applications.

The afternoon was dedicated to a workshop on IMS LD entitled "Beyond Level A" by **Daniel Burgos** of the OUNL.

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## **Day 2: Thursday 13th October**

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### *Using and accessing Learning Design*

The second day of the event focused on use and accessibility of and to the specification. The entire morning was dedicated to a workshop on SLeD led by **Patrick McAndrew** of the **Open University UK**. The session involved group brain-storming sessions and discussion aimed to encourage people to think about what we actually want from LD players and editors, what was missing, what needed extending, which users it worked best for as well as issues relating to Learning Design notably the pros and cons. This was

followed by a demonstration of learning designs and the ways in which they could be used as well as an overview and demonstration of the SLeD player which has been used to successfully run all of the UoLs in the UNFOLD repertoire.

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The afternoon saw a number of sessions running in tandem. These included parallel presentations and talks on tool specific issues and implementation of Learning Design. **Alex Little** of the **Open University** opened the first of three fairly technical presentations with another look at **SLeD**. The presentation began by situating itself within the framework of Toolkit, a JISC funded project which concentrates on new developments to the SLED player, not to be confused with the Demonstrator project which aims to demonstrate Learning Design using the SLeD player. The aim of the Toolkit project is to integrate additional services into LD (e.g. QTI and ePortfolio) and to make the switch between service providers as seamless as possible. Whilst the integration of the QTI specification proved relatively easy to perform, the integration of ePortfolio would require the creation of a new language to deal with the transfer of an individual's data.

This was followed by an introduction of **COW**, a workflow tool with potential to be made IMS LD compliant from **Yvan Peter** at the **University of Lille 1**. The presentation resulted in valuable discussion on the nature of workflows in relation to learning flows and the Learning Design specification.

**Jose Pablo Escobedo** of the **University Carlos III in Madrid** followed with a presentation on integrating IMS LD in **dotLRN**, a suite of collaboration tools backed by the .LRN consortium that could make use of LD to help in the creation of documents to specify a set of learning activities, who does what when and with which conditions.

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Parallel to the above mentioned sessions, there was a workshop on the **COLLAGE** (Collaborative Learning Design Editor) tool run by **Davinia Hernandez Leo and Elloy Villasclaras** of the **University of Valladolid** in Spain. The workshop proved that it is possible to create a pattern-based tool and led to some discussion on integrating patterns with Learning Design. It was pointed out that current trends in the CSCL (computer Supported Collaborative Learning) community has led to a debate on what the script for pattern based tools should be and how it should be constrained. For COLLAGE the answer is to use the Learning Design specification as an appropriate way of representing workflows in CSCL.

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The plenary presentation and discussion was centred around **Cordys Educator** and was led by **Roel Nicolai**. Cordys Educator is touted as a competency and learner driven learning environment and repository. The application was seen to include a student portfolio in which they could save work and monitor their progress in terms of competencies as well as an assessment module for building different types of assessment. In addition, the tool had a sophisticated looking drag-and-drop interface. Whilst the application is not currently compatible with Learning Design, Cordys Educator is looking to develop compliancy with the Learning Design specification.

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### **Day 3: Friday 14th October**



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***Implementing the specification in institutions***

The last day was given over to lots of interesting discussion and started with **Scott Wilson's** (CETIS) discussion of tool service launch and management. Discussion focused on the ways and means of integrating tools and workflows which were described as a coordinate series of actions intended to work in conjunction with workflow aware tools such as chat systems. The presentation drew attention to the fact that although some tools can function without any knowledge of the workflow of which they are part, others need flows that are flow "aware" because their behaviour is context dependent. Provisioning is a way of making flows "aware" and involves the identification of users or groups who will use a tool instance such as a chat room before the user is related to the tool entitlements. Most provisioning is found in close-coupled tools that pose few problems whereas loosely coupled tools engender a number of authentication issues in relation to provisioning. Solutions to the provisioning issue were provided and led to open discussion on the problems of legacy of the IMS LD specification.

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**Sarah Currier** and **Lorna Campbell** (also of CETIS) followed Scott's session with a talk on pedagogical vocabularies. The talk centred on a JISC "Pedagogical Vocabularies" Project and provided an overview of the initiative and an introduction to the concept underpinning such vocabularies. It was stressed that the project aims to weigh up the different available vocabularies for use in post 16 and HE education in the UK and NOT to develop a brand new vocabulary. In addition the project is tasked with reviewing technologies for capturing, developing and managing vocabularies and making recommendations on further developments in the domain and how these might fit with related JISC work.

Having looked at the rationale and progress made with the project so far, the issue of different types of vocabularies (e.g. taxonomies, ontologies etc) and different needs was addressed both generally and in relation to their use in LD and it was made clear that, contrary to most people's expectations, LD is intended as a tool for describing activity and not for describing pedagogies and theories of learning. A request was then made for people to put forward their ideas on the kind of information should be collected in relation to vocabularies which led to in-depth discussion among participants.

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The morning was rounded off with an update on all things LD from **Colin Tattersall** of the **Open University of the Netherlands**. The update included mention of a new version of the IMS Learning Design specification which will undergo a number of minor modifications by Rob Koper at the level of XML schema. The new TENCompetencies project was also referred to in relation to the LD specification which will fall within its remit and Dai Griffiths talked briefly on vocational training under the Leonardo Project which aims to gather materials and put them in a repository which could be accessed to create UoLs which could also be stored in the repository.

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**Bill Olivier** of the JISC opened the afternoon session with an interesting presentation on the Learning Design Reference architecture with a look at the different systems required for Learning Design in terms of both the authoring and runtime environments. The

presentation was based on a number of architectures including the Valkenburg diagram, the Dagstuhl diagram and the LADIE reference model.

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Finally, the day came to an end with a presentation and discussion of the implementation of Learning Design at **Liverpool Hope University** led by **Mark Barrett Baxendale**. As one of the few institutions currently implementing the Learning Design specification, this session proved of great interest and value to the delegates and resulted in some useful discussions around issues of usability. Experience of using level B of IMS LD at Liverpool Hope involves the use of both Coppercore and SLeD in the second year of a design and implementation course. Results of their experience suggested that students should be shielded from the specification and should not be confronted with tools such as SLED that require explicit knowledge of the specification.

A number of issues were identified in relation to implementation of the specification including usability of the LD player, ways to set up Learning Designs without over complicating things (i.e. setting up level B properties was easier to do in XML than in RELOAD.), handling groupwork, the lack of flexibility in an LD run, the granularity of Learning design, performance issues and file formats in SLeD. Positive comments included the way in which LD enabled the capture of traditional practice and allowed learners to progress at their own pace. It was also considered conducive to collaboration in blended learning situations.

On the whole the meeting proved both stimulating and informative and resulted in some valuable exchanges and feedback from the participants who played a large part in making the event a success.

## **November 28<sup>th</sup> 29<sup>th</sup>: Berlin CoPs Meeting. Next generation activity based eLearning**

This two day meeting was scheduled just before the pre-conference workshop on Reference Models which UNFOLD attended. Rob Koper of the OUNL was at the helm, and the meeting proved highly productive..

Meeting materials and links to outcomes and presentations are available at <http://www.unfold-project.net/project/events/cops/berlin/>

The agenda for the meeting consisted principally of working sessions, as follows.

### **Day 1 Identifying requirements**

The task for day one was to identify the requirements for a next generation LD based eLearning solution. All participants were asked to bring with them a roughly worked scenario which they would like to see implemented in the next generation of LD based systems. Through a series of small group meetings these scenarios were worked into a single summary, available on LN4LD.

### **Day 2: How can the requirements be met**

On day two the meeting took the functionality which was defined on day one and examined ways in which it could be put into practice. For the bulk of the days activities the meeting divided into two groups focusing on Architecture and Pedagogy.

*The architecture group* set out to plan for the needs of a second generation of LD based systems. This involved a number of steps which included the review of existing architectures. Their remit was to come to a decision on the extent to which they were able to provide support for the required functionality and Scott Wilson of CETIS was invited to make a presentation, and then to lead the drafting of a third architectural model concerned solely with runtime behaviour. The work was carried out in consultation with developers and designers to ensure compatibility of systems such as SLeD/CCSI, PLEs, Web 2.0, and with non-LD workflow management systems all of which had been developing in the interim. At the end of the meeting a diagram of the 'UNFOLD Berlin architecture' was established, building on earlier architectures or Learning Design established in Valkenburg and Dagstuhl. This remains work in progress, but distils much of the discussion of IMS LD and service based architectures which has been conducted in UNFOLD during the last eighteen months. It is a public document, and UNFOLD is delighted that this architecture has been taken on as an input by the newly started TENCompetence project, which had a number of representatives at the Berlin CoP meeting.

*The pedagogy group*, running parallel to the architecture sessions, looked at

- the possible range of 'pedagogical primitives' which could form the basis of the activity structures to be used to divide LD functionality into chunks that could support teachers and learners in their use of the proposed system
- the vocabulary that might be used as the starting point for this division

In Sue Bennet of the University of Wollongong, Australia, provided the focus for this work with a presentation on the work of the Research Centre for Interactive Learning Environments, which has looked at this issue in detail.

It proved difficult to achieve consensus on the necessary pedagogical primitives, but the exchange of viewpoints was both robust and positive, enabling the participants to move forward in their understanding of the challenges which this process entails. A vocabulary

of thirty items was proposed for activities to be carried out by learners, drawing on the taxonomy presented by Sue Bennett and on the discussions of the group. A voting process was conducted to identify those which were considered most relevant, with the following results:

<b>concept</b>	<b>count</b>
<b>Construct/Produce/Create</b>	<b>13</b>
<b>Discuss</b>	<b>12</b>
<b>Analyse</b>	<b>11</b>
<b>Research</b>	<b>9</b>
<b>Evaluate</b>	<b>8</b>
<b>Design</b>	<b>7</b>
<b>Report</b>	<b>6</b>
<b>Explore</b>	<b>4</b>
<b>Explain</b>	<b>5</b>
<b>Reflect</b>	<b>6</b>
Predict	3
Observe	5
Debate	3
<i>Apply</i>	3
Justify	3
Practice	5
Present	4
Critique	2
Assess	2
Perform	2
Describe	2
React/Respond	1
Interpret	1
Resolve	1
Review	4
Question	2
Refine	2
Decide	1
Represent	0
Access	0

These results were not considered to be a final outcome, but rather an indication of the point to which the meeting had reached, and requiring further analysis and clarification.

### **Additional sessions**

In order to provide variety, and to make the most of the range of expertise available at the meeting, a number of additional short sessions were included.

- Griff Richards of Simon Fraser University Canada provided an update on Canadian work on federated repositories of UoLs linked with federated networks of social software tools.
- Rachel Ellaway described ACETS Project and the ‘Semi-structured Learning Design Statement’ which uses Learning Design to document teachers practice.

- Mark Barret-Baxendale of Liverpool Hope University presented an update on his Experience of using IMS Learning Design in Higher Education in one of the University's postgraduate courses.
- Davinia Hernández Leo demonstrated Collage, a pattern-based Learning Design editor
- Two significant developments were reported from the industry sector
  - Progress made in providing Learning Design interoperability for .LRN (see LN4LD forums for updates on this process)
  - the announcement by Martin Hammitzsch of TheCoDe, of one of the first commercial implementations of Learning Design to be released.

## 6.2 UNFOLD Public conference

### **September 22<sup>nd</sup>: UNFOLD/Prolearn Workshop, Valkenberg**

Around 60 participants attended the latest UNFOLD community meeting in Valkenburg in the Netherlands. The meeting focussed on the latest publication of the renowned online journal JIME (Journal of Interactive Media in Education). This special issue of JIME ([jime-open.ac.uk](http://jime-open.ac.uk)) concentrated on IMS Learning Design and contained a number of review articles on the book "Introduction to Learning Design" by Koper and Tattersall (edt.) which was published earlier this year. These contributions and a few additional ones, which represent the latest research and experience with IMS LD, were also presented at the conference as printed proceedings ("Current Research on IMS Learning Design" by Koper, Tattersall and Burgos eds.).

After a brief presentation of the related ProLearn project which runs under the same EU funding programme, the two day meeting was grouped into seven topic areas, which were all plenary sessions with presentations. Unlike previous UNFOLD meetings there were no hands-on workshops.

The event was opened by **Rob Koper**, who explained how UNFOLD and ProLearn are collaborating. He noted that there will be another joint event in February 2006, and it is hoped to hold similar activities later in the life of ProLearn. Additional introductory remarks were made by **Marco Marsella** from the European Commission, who was attending the event. Martin Wolpers then provided an **introduction to the ProLearn project** and an outline of their activities. Dai Griffiths **introduced the UNFOLD project**, and informed us of upcoming events and activities right up to the end of the project at the end of the year. We can expect a few more interesting online discussions (the next being on 28 Sep.), a community of practice (CoP) meeting in Glasgow (12-14 Oct.) and a pre-meeting to the Online Educa event in Berlin (28-29 Nov). We were assured that the UNFOLD website and the LN4LD space would be continued beyond the lifespan of the project.

The meeting was divided into the following sessions, which were chaired by Rob Koper and Colin Tattersall. The presentations were largely in the order they are described here, but in some cases they have been placed together from different sessions to make a more coherent grouping.

Links to the presentations are provided in the text, and the full collection of presentations is also available at <http://hdl.handle.net/1820/439>

#### **1. Patterns and Reuse**

The topic of the potential usefulness of pedagogic patterns within UoLs still produced useful discussions between veterans and newcomers. Davinia Hernandez-Leo of the University of Valladolid presented progress on development of their template approach of **collaborative learning flow patterns** that can be integrated into authoring tools such as their own COLLAGE ([gsic.tel.uva.es/collage](http://gsic.tel.uva.es/collage)). Helge Holvike noted that our Web behaviour was changing from merely consuming to doing things, and Ceasr Olava de Moura of the University of Lille stated that **patterns can provide LD with a collection of (best) practice in education** that can guide designers when constructing UoLs. Francis

Brouns of the OUNL discussed the potential and limitations of an **inductive approach to IMS-LD patterns**.

Following the presentations the discussion focussed on the meaning of "patterns" in our context, and on attempts to implement deductive and inductive derivation of patterns from existing practice.

## 2. Managing IMS LD

In this strand Gayle Calverley of the University of Manchester queried **institutional business case scenarios** for uptake of IMS LD with the question "why to adopt", while Wolfgang Greller of the UHI Millennium Institute highlighted the daunting task of **"how" to implement and embed in an existing workflow and tools environment**. He suggested directing current efforts into stimulating a bottom-up approach and teacher demand. Pedro Pernias and Daniel Moron of the University of Alicante discussed the way in which **grid computing and IMS-LD** could work together

## 3. Tooling

Colin Milligan of the University of Strathclyde presented the by now well known **Reload LD editor**, which has become a reference implementation of the specification. Despite the sadness of the development project being finished, he announced that a Reload Foundation would be established, and that ADL and HarvestRoad have taken on the code and that it was hoped they will maintain and further develop it. Patrick McAndrew of the OU UK observed that most of the discussions within the community focussed on the development of editors and what was equally needed were **attractive LD players**. There are already some rudimentary players around, mostly based on the CopperCore engine. Martin Weller, also of OU UK, talked about one of them, **SLeD** by the OUUK (sled.open.ac.uk) and using a service oriented architecture approach. On the second day, Telmo Zarraonandia of University Carlos III of Madrid presented a proposal for a modified player engine that would allow **minor runtime adaptations** to UoLs. Andreas Harrer of IKT-Pedagogen introduced the idea of using **IMS-LD as a means of managing remote control of learning environments**. Ecaterina Pacurar Giacomini of the University of Technology of Compiègne described the ambitious **NetUniversité Portal**, developed as part of the **CEPIAH Project**, which provides teachers with support in designing UoLs and a run time environment.

## 4. Ontologies

Attempts were made by Manuel Lama of the Univeristy of Santiago de Compostella, and Colin Knight of Simon Fraser University to bring LD ontologies closer to the community. What stood out of their talk was the emphasis that **XML may be limited in the description capabilities of LD relationships and that OWL could be an improved language for this purpose**. Work on parsers in both directions and taxonomies of LD concepts is under way. The ALOCoM and LOCO ontologies are being developed with the aim to increase reusability by separating context related metadata from the abstract patterns and by decompose the content.

## 5. Modelling

Michael Klebl of Katholische Universität Eichstätt-Ingolstadt **mapped UoLs into a Moodle course structure** and gave a case study of a blended online/offline synchronous environment. He stressed the importance of having some way of indicating that certain resources were in the real world, rather than a computer based. Peter Sloep of the OUNL recounted the extensive Alphanet experience in standards-compliant authoring of adaptive learning units using several IMS specifications simultaneously. Michel Leonard of LICEF, Télé-université presented the **UML-based model of the MOT+ editor and the MISA**

**description tool for metadata.** Furthermore he introduced us to their generic competencies and skills taxonomy. In the same way, Chris Bailey of Southampton University presented the **DialoguePlus toolkit with its pedagogic taxonomy extracted from "nuggets"**.

#### **6. Pedagogic expressiveness**

Ger Tieleman of Het Stedelijk Lyceum presented **the way in which Moodle deals with learning design** and hoped that usability of any LD player would rival its ease of use. Integration of LD in Moodle is expected to happen in the next major release. Manuel Caeiro Rodriguez of the University of Vigo described a proposed **model for evaluating the expressiveness and of LD** based on activity theory. while David Bean and Leslie Richards of Waterloo University, Canada, described how they are implementing **templates in IMS LD** in as part of the **LearningMapR** application, which guides lecturers in improving their pedagogic practice.

Over all another most stimulating event, which included "veterans" and "newcomers" showing that the community of practice has (a) grown, and (b) created loyal followers. (Many thanks to Wolfgang Greller for providing this overview)

.All working documents and presentations for this meeting can be found at the following URL: <http://dSPACE.ou.nl/handle/1820/439>



## **UNFOLD Workshops**

### ***November 14<sup>th</sup> SIGOSSEE Conference, Heerlen***

The SIG Open Source Software for Education in Europe held a four hour UNFOLD workshop on IMS LD in mid November 2005. The workshop was entitled “IMS Learning Design tooling in practise” and was targeted at newcomers in the field who had little or no knowledge of the technical issues involved in the project.

#### **Objectives**

The aim of the workshop was to enable participants to enhance their understanding of the capabilities and structure of the Learning Design specification. Furthermore, it provided an up-to-date overview of the current Learning Design tool set, and encouraged evaluation of said tools through the creation of Learning Design compliant UoLs. For this purpose a CD containing the various tools was distributed free of charge to the participants.

In order to achieve these objectives, the workshop was divided into two sessions:

First session:

1. Introduction to IMS Learning Design (20 minutes)
2. How to build a full Unit of Learning in practise (40 minutes)
3. A practical example with CopperCore and Reload (60 minutes)

Second session:

4. Hands-on session checking LD tools and making Units of Learning (90 minutes)
5. State of the art of LD (15 minutes)
6. Discussion (15 minutes)

***All working documents and presentations for this meeting can be found at the following URL:  
[<http://hdl.handle.net/1820/487>]***

## **November 18<sup>th</sup> UNFOLD Workshop/EUCEN Conference, Rome**

The workshop addressed the need for the adoption of open standards that will revolutionize e-learning from a simple, content-based, single learner, 'deliver-and-test' approach, to a sophisticated activity-centered learning experience in which multiple users are able to interact through activities and services.

The session included an introduction to the IMS Learning Design specification followed by an opportunity for participants to create their own learning designs using the RELOAD Learning Design Editor and player tools. This one and a half day workshop was intended to provide an opportunity for attendees to experience the IMS LD specification over a short but intensive period. Specifically it aimed to:

- enhance their understanding of the capabilities and structure of the Learning Design specification
- obtain up to date knowledge of the current Learning Design tool set, and evaluate some tools by creating a Learning Design compliant Unit of Learning.
- Assess the practicalities for adoption by their home institutions by understanding the infrastructure which needs to be in place for successful use of Learning Design.

The workshop proper was facilitated by Chris Kew of CETIS, Bolton University, UK and Ana Dias, TecMinho/ University of Minho, Portugal, in this context a representative of EUCEN.

It was spread over a day and a half and started with an overview of the themes of the workshop followed by an introduction to eLearning specifications and IMS Learning Design in the form of a powerpoint presentation and general discussion. This was followed by an overview of Learning Design both in terms of its rationale and it's basic concepts. In the final session of the morning, the design process of an IMS LD compatible UoL was demonstrated in preparation for the hands-on session later in the day.

After lunch there was an introduction to the RELOAD editor and viewer and participants were given a guided hands-on tour of the software. The final session consisted of a task in which participants were required to reconstruct an IMS LD unit of learning with the RELOAD authoring tool.

The following day included a summary and review session complete with questions and answers and the workshop finished with a presentation on ways in which to participate in Learning Design Communities.

Resources and presentation materials used for the workshop can be found at the following URL: <http://www.eucen.org/conferences/past/Roma/EUCENWeb/Programme.htm#2>

## ***December 8<sup>th</sup> UNFOLD/TASELL (Technologies de l'Apprentissage: Standards et Logiciels Libres) Workshop: Dakar,***

The UNFOLD presence in Dakar, Senegal was run by Chris Kew as part of a two week workshop on standards and open source software organised by the training centre of the International Labour Organisation in conjunction with the AUF (Agence Universitaire de la Francophonie) and the CNF (Centre National de Formation) Dakar.

The participants (15 in total) comprised of higher education lecturers, teachers and a small number of technical people (programmers) from around west and central Africa.

The workshop was spread over two days and started with an overview of the themes of the workshop followed by a general discussion on the state of eLearning today and its pros and cons. This was followed with an introduction to eLearning specifications and IMS Learning Design in the form of a powerpoint presentation and general discussion.

Next came a more detailed look at Learning Design both in terms of its rationale and it's core concepts and an elaboration on the design process of an IMS LD compatible UoL in preparation for the hands-on session later in the day.

After lunch there was an introduction to the RELOAD editor and viewer and participants were given a guided hands-on tour of the software. The final session consisted of a task in which participants were required to reconstruct an IMS LD unit of learning with the RELOAD authoring tool and to design and create UoL of their own using the RELOAD authoring tool and viewer.

The following day included a summary and review session complete with questions and answers and the workshop finished with a presentation on ways in which to participate in Learning Design Communities.

Although most participants were new to the world of standards, few had problems understanding the specification and use of the editor. General interest was high and resulted in nine subscriptions to the UNFOLD communities.

Further details of the event can be found at:

<http://zope0.itcilo.org/delta/2005/tasellao/home/info>

## **December 12<sup>th</sup>, 13<sup>th</sup> & 14<sup>th</sup> UNFOLD/Complutense Workshop - Universidad Complutense, Madrid**

Organized by the University of Complutense Madrid (UCM) in conjunction with the UNFOLD project, “An experience with IMS LD specification and blended learning Real teachers and actual needs” was a run as a fifteen hour workshop and included the participation of between thirty and forty teachers from the University linked to the Virtual Campus educational platform. The session was run by Daniel Burgos and Josep Blatt of the UNFOLD project.

### **The Context**

UCM is a real face-to-face university and uses WebCT for blended learning. There is a need to express current pedagogical scenarios in a flexible and easy way and a wish to model lesson plans in an open source specification. The university wants to explore the possibilities of using IMS LD in blended learning due to its ability to model pedagogically expressive scenarios (which are also blended) and to provide some answers, solutions and questions to the needs of UCM.

### **The Objectives**

The workshop concentrated on explaining and demonstrating the possibilities of the IMS Learning Design specification as part of a pedagogical model for blended learning and provided an opportunity for participants to create units of learning. More specifically the objectives included:

ensuring knowledge of IMS LD

creating and running a real Unit of Learning

moving an actual lesson plan to a IMS LD Unit of Learning

In order to encourage participation during the workshop a forum was set up in Moodle prior to the event where participants were free to discuss issues they felt were relevant in preparation for the event.

### **The agenda**

#### **DAY 1. AWARENESS RAISING**

Basics on e-learning and specifications (Josep)

Why do we need specifications in e-learning

E-learning, open source and specifications. Current panorama

Overview of IMS Learning Design

Practical pedagogical applications of IMS Learning Design

IMS Learning Design in action (Daniel)

Example of IMS Learning Design in e-learning and b-learning

Guided tour through a UoL

Guided creation of a UoL

Assisted creation of a UoL

Discussion: How can IMS LD fit the goals of teachers in UCM? (Josep)

## DAY 2. IMS Learning Design TUNNING

Moving a regular lesson plan into a UoL (Daniel)

Requirement: participants need to come with a already written lesson plan following a form, ready to be downloaded with anticipation

Writing and setting-up of a lesson plan  
Collecting the resources and structure designing  
Modelling the first draft  
Publication and running  
The debugging process  
Final art and upload

## DAY 3. BRAINSTORMING AND DISCUSSION

Discussion and feedback: WebCT, state of the art (?)  
Which are the actual needs of the teachers?  
Current challenges  
Suggested solutions

IMS Learning Design and blended learning (?)

Showcase: Specific b-learning scenarios and use of IMS Learning Design  
Integration of IMS Learning Design and current LMS's  
IMS Learning Design versus WebCT

All related resources and presentation materials used for the workshop can be found at the following URL :

<http://moodle.learningnetworks.org/course/view.php?id=37>

## **Participation in events organised by other projects and institutions**

### ***July 1<sup>st</sup>: EIAH, Grenoble, France***

The third “Ecole thematique sur les EIAH” is best described as a workshop on computer based learning technology which is organised by the National Scientifique Research Centre (CNRS) in France. The event was spread over six days (1st July to the 6<sup>th</sup> July – weekend included) and was held in the alpine region of Autrans in Isere (Eastern France). The participants included somewhere in the order of fifty participants and included researchers and PhD (Doctorant) “students”. The agenda for the event focused heavily on computer modelling of learning systems and included a presentation on Learning Design by Anne Lejeune of CLIPS-IMAG (Grenoble).

UNFOLD participation at the event involved a 75 minute presentation on the “philosophy” of the UNFOLD project in French by Chris Kew of CETIS. The contents of the presentation included:

- A presentation of the UNFOLD project: Partners, objectives etc.
- The UNFOLD Communities of Practice
- Results obtained so far
- Prospects
- IMS Best Practice

The presentation provided participants with an overview of the UNFOLD project and provided them with an opportunity to ask questions on a variety of issues from the make-up of the CoPs to plans for future events. Indeed, the event provided an opportunity to announce up coming events as well as the shift of forums from UNFOLD to LN4LD. The event also served to reinforce relationships with French contacts who are currently active in the field of Educational modelling languages and pointers wer given to a number of IMS LD based resources (documents, videos etc.) which has since been made available to both the French and English speaking communities on the UNFOLD website as a series of links.

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### ***July 5<sup>th</sup>: Keynote presentation - The 5<sup>th</sup> IEEE International Conference on Advanced Learning Technologies Taiwan***

The presentation document for this event can be found at the following address:  
<http://hdl.handle.net/1820/405>

## **July 12<sup>th</sup> - 13<sup>th</sup>: OSS 2005, Genova Italy**

UNFOLD presented a paper written in collaboration with the SIGOSSEE project, which is promoting Open Source software in Education. This examined the relationship between Open Source software and IMS LD. The paper is reproduced below. At this conference contact was first made with the .LRN team, who subsequently have implemented an IMS LD player in their system.

### **Open Source and IMS Learning Design: Building the Infrastructure for eLearning**

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**Abstract** – The development of open, flexible eLearning specifications has significant implications for and interactions with the FOSS movement. A short overview of eLearning specifications is provided, focusing on the difference between SCORM and Learning Design (LD). The significance of LD for FOSS is examined, and common values identified. The particular contribution made by FOSS to LD infrastructure is discussed, and the importance of reference applications described. An overview is given of the FOSS applications available, divided into design time and run time, with particular reference to LD editors and the CopperCore Learning Design engine.

#### I. INTRODUCTION

This paper is strongly informed by discussions held in the context of two European projects in which the authors are involved. Firstly they are members of the Special Interest Group on Organisation and Management Issues of SIGOSSEE/JOIN [1] which promotes the use of Free and Open Source Software in education. Secondly, the UNFOLD project [2], which supports the adoption of IMS Learning Design, which we explain later. The cross fertilisation between the two communities of participants in the projects has given rise to many of observations made here, and provided the context for examining the contributions which Open Source and Open Standards can bring to each other communities of developers and users. Free and Open Source Software (FOSS) has made significant progress in European education in recent years [3] and more recently the Creative Commons [4] initiative has extended this to open content. In a separate development, Open eLearning Specifications for interoperability have been established, which provide the means whereby eLearning resources can be exchanged between systems. We outline the growth of Open eLearning Specifications, and focus in particular on IMS Learning Design (LD), in part because it is the focus of a substantial current open source effort, and also because it has features which are of particular relevance to FOSS.

In the discussion below we discuss both the relevance of LD for FOSS eLearning implementations, and the particular ways in which FOSS can support the development of LD software infrastructure. We then provide an overview of the applications available so far and those under development. Unless otherwise stated, all the applications discussed are FOSS.

#### II. THE RELEVANCE OF IMS LEARNING DESIGN FOR FOSS ELEARNING IMPLEMENTATIONS

##### *A. An outline of open eLearning specifications*

A key initial milestone in Open eLearning Specifications was the Ariadne project in 1997 [5], which worked on defining metadata for the identification of learning objects. The Ariadne metadata itself included the more general Dublin Core Metadata Initiative metadata for electronic resources from 1994[6]. In 1997 IMS Global Learning Consortium Inc. (IMS) was established to produce specifications for all aspects of

distributed learning [7]. IMS has become the leading force in defining Open eLearning specifications, and has adopted much of the Ariadne's metadata in the IMS Learning Object Metadata (LOM) specification. IMS has produced a growing suite of specifications, some of which have achieved high levels of adoption. A number of these, such as Content Packaging, Question and Test Interoperability, and Simple Sequencing, are incorporated in the Sharable Content Object Reference Model (SCORM) produced by Advanced Distributed Learning (ADL) [8]. This process of consolidation, and the wide adoption of the SCORM mean that there is now a solid base of accepted de facto standards for eLearning interoperability.

It may be worth stressing that open source code does in itself imply interoperability. While FOSS provides many advantages, it does not automatically mean that documents can be ported to other systems, or that different systems can work together. Interoperability specifications provide important added value, especially in educational environments which are largely heterogeneous.

The choice of an open eLearning specification is not merely a technical issue, it has strong consequences for the educational activities which are supported, as argued by Friesen [9]. In the case of SCORM it is well positioned to address the needs of a single learner in programmed learning<sup>1</sup>, but cannot handle multiple users, and cannot represent the role of the teacher. The pedagogy which it supports may be characterised as an implementation of the "conduit" metaphor, as described by Lakoff [11]. It should be stressed that this is not because the specifications which make up the SCORM are in themselves bad. On the contrary they are an essential part of the infrastructure for interoperable eLearning. The problem is that they are insufficient, because they deal primarily with educational content, without supporting flexible activities and collaboration.

### *B. The significance of IMS Learning Design for FOSS*

A more recent IMS specification, Learning Design (LD) sets out meet this lack, and like IMS LOM it also builds on previous European work, in this case Educational Modelling Language (EML) from the Open University of the Netherlands. LD provides a language which can model pedagogic scenarios, including multiple learners in collaboration, and the role of the teacher. It does this by providing a precise description of how people in roles carry out activities with learning resources. For more information on LD, please see [7, 12, 13]. The specification was published in 2003, and work on creating the tools needed to work with it is currently reaching fruition.

It is clear that FOSS can be used to support all kinds of eLearning, including programmed learning. Nevertheless, there is a substantial overlap between the values of the FOSS community and those of educators who work with pedagogies which may broadly be described as constructivist. Among other aspects, this tradition emphasises the importance of collaboration, of discourse, of multiple valid viewpoints, and the idea that each learner needs to be supported in constructing their own meaning with culturally appropriate tools. This clearly has much in common with the FOSS communities stress on collaboration, adaptation of software to local requirements, and localisation to many cultures. FOSS eLearning using open specifications and informed by a constructivist approach was not possible prior to the publication of LD, and consequently many FOSS developers in education had to choose between two undesirable options: lack of interoperability, or restriction to a constrained (and perhaps unsympathetic) pedagogic framework. LD resolves this conflict, and will therefore be welcomed by many FOSS developers.

To be fully effective, however, a specification for interoperability needs to be adopted in both FOSS and proprietary software. The SCORM has achieved high levels of adoption, in part because it has been supported by received substantial direct financial support from the US Department of Defence, totalling 84.4 million dollars between 2003 and 2009 [14], plus mandated compliance from Federal authorities. Much of this funding has gone to subsidise the production of proprietary applications. So far LD has not received anything near such funding or mandated support, despite the fact that the specification is much more complex, and hence implementation more challenging. The need for LD to succeed is felt most keenly by learners and teachers and educational institutions, rather than by publishers and software companies. Consequently it is not prudent to rely on proprietary software providers to create critical mass for LD, even though they are not opposed to it. To overcome this strong bias towards the dominance of the SCORM there is a need for a concerted effort to create a complete FOSS infrastructure for the LD, and this is indeed coming about, funded by European, national and institutional sources, as we describe below.

## III THE IMPORTANCE OF FOSS IN CREATING AN INFRASTRUCTURE FOR LD

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Programmed learning: "Learning in which the students progress at their own rate using workbooks, textbooks or electromagnetic resources that provide information in discrete steps, test learning at each step and provide immediate feedback about achievement"[10]



The implementation of the LD specification, which has been coordinated by the Valkenburg Group (with a significant FOSS presence). The Group has developed a reference architecture which defines the applications which need to be built, and has, together with the UNFOLD project, coordinated the development process. There are other higher level structures which provide the context for the reference architecture, including the eLearning Framework (ELF) based in the UK, and the OKI and SAKAI initiatives in the USA, all of which have a strong FOSS orientation. For a discussion of the Valkenburg Group architecture, and these frameworks and their relationship to LD, see Wilson [15] Service based architectures have also been addressed in the SBLDS project [16] funded by JISC in the UK.

Thus there is collaborative framework for development of an infrastructure for open specifications which promises to lead to a complete FOSS infrastructure for eLearning, equivalent to that available for the Internet. This is very valuable as a unifying structure for the development efforts of FOSS developers in education, who can be sure that their work will be interoperable and adaptable for a world wide community of users. Communities such as UNFOLD provide a central store of information so that developers know what has been achieved so far in creating an LD infrastructure, and can identify the most urgent needs. They also welcome FOSS developers with a forum where they can provide input into the evolving architecture for LD.

The use of FOSS in creating this infrastructure makes a contribution to LD (and the wider frameworks) in three important respects. Firstly it offers a way to achieve critical mass. Potential adopters need to be shown the benefits of LD before they will adopt it, and publishers and proprietary software developers want to be shown that there is a market before they will develop for it. FOSS can provide the impetus to drive adoption by making free tools available which potential users can try out at no cost. Secondly, the LD specification is extensive and complex, and it is far from simple to implement software to edit compliant documents, and servers on which the resulting XML can be run. The only way to ensure interoperability is to have reference implementations which represent the agreed interpretation of the specification and ways to implement it, and which have their source code open to inspection by other developers. If these are not available, then each team of developers will make their own decisions when faced with a problem of interpretation of the specification. The sum of the variant interpretations in the different sets of applications processing LD documents in different installations would lead to inconsistent output being provided to learners (or perhaps even a failure to run) and interoperability would be lost.

Thirdly, the well defined architecture for LD development, and the coordination of development, means that developers can often build on existing FOSS implementations in order to add new functionality. This greatly speeds implementations of the specification, and makes adoption more likely.

#### IV. PROGRESS TO DATE IN DEVELOPING A FOSS INFRASTRUCTURE FOR LD

The types of tools required for working with LD are discussed in Griffiths [17], and we direct readers there for a detailed discussion. Here we limit ourselves to providing an overview of the specialised tools required, and a summary of the principal FOSS projects underway at the time of writing. The tools for working with LD may be divided into two main categories, design time and run time, which we will examine in turn. The most significant developments are summarised at a table in following section, together with URLs.

*1. Design time tools.* These are the various categories of editors, together with compliance testing applications. We do not consider the enabling framework within which these operate. LD Units of Learning<sup>2</sup> (UOLs) are encoded as XML files, and a valid UOL can be written in any text editor (if the author has sufficient skill and patience!). There is, however, no reason why an author should ever see the raw XML [18], which should be handled transparently by the application. The first generation of LD editors to appear has represented the UOL as a branching tree, with an interface which enables the author to navigate through the tree and enter the appropriate values for the LD elements. An editor of this type at a minimum helps the author by hiding the complexity of the XML syntax, and by guiding them through the hierarchy, so that elements are not misplaced. There are, however, other important functionalities which tree based editors can provide. They can handle the internal references which need to be updated whenever a new resource is added or changed. It is very useful if they provide a mechanism for the user to incorporate existing fragments of UOLs (for example an activity structure) and incorporate them in a new UOL. It may also be valuable to be

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<sup>2</sup> A Unit of Learning is a defined term in the LD specification, giving a precise meaning to the broad unit of learning concept as an independent, relatively self-contained piece of learning.

able to rename the elements, to make them more understandable to members of particular communities of groups of users, or for different language groups.

Examples of FOSS implementations of tree based editors include RELOAD [19], aL.Fanet LD Editor [20], COSMOS [21], and CopperAuthor [22]. They may divide the specification up into sections, as does RELOAD, providing separate tabs for editing roles, environments activities and method. These implementations are leading the way in LD implementation, as no proprietary editors have yet been released.

Authoring a UOL in a text editor is a job for a programmer, and tree based editors greatly simplify the task so that it can be undertaken by anyone who is, for example, comfortable authoring web sites, and who is willing to put in the effort to understand the structure of a UOL and the purpose of the elements which make it up. This means that they are appropriate for specialists in the development of learning materials and online courses, but they are still too complex and extensive for teachers (or learners) to be able to handle, as they are not able to invest the necessary time. It is important that teachers can engage with the authoring process so that, for example, they can add and change resources in existing UOLs, and inspect a UOL and recognise if it is appropriate for their purposes. It is also the case that some teachers want to be able to understand and control the computing environment in which they are working, and may want to set up their own courses. For this to be possible the complexity of the specification has to be reduced in some way. This can be achieved in a tree based editor by constraining the options available to the author, so that many design decisions are taken in advance and hidden from the author. A template of this sort can also be presented in many other ways, for example the EduPlone [23] LD authoring facility offers a form based interface for the creation of a restricted set of simple UOLs. This approach may be more effective if combined with a patterns based analysis of the pedagogical problems which the templates address. An encouraging development is that the Moodle [24] community is showing interest in LD, and there is no doubt that an LD compliant version of the Moodle system would be a very valuable addition to the available LD infrastructure.

Another approach is to provide users with predefined chunks of UOLs which they can combine to form valid UOLs. These may be patterns (structures which resolve a specified pedagogic problem) or primitives (which are commonly used components which teachers can combine for their own purposes) See Griffiths [25] for a discussion of these terms and their implications for LD. These components need not be limited to a single LD element, and could consist of, for example, a combination of a role part and a service. This is done in the ASK-LDT editor, produced by the CERTH Centre [26], where the author can drag predefined structures into the UOL as it is being constructed. ASK-LDT is not intended as a tool for teachers, but does provide an example of the kind of functionality which could be provided. A tool which is specifically intended for teachers is LAMS(Learning Activity Management System) [27] which provides an easy to use interface enabling authors to drag activities into a sequence. This has so far not been LD compliant, but an LD import/export capability is scheduled for release in June 2005.

FOSS authoring tools for teachers are scarce, and as yet not mature. In this the development of LD infrastructure is following that of, for example, the relatively simple HTML specification, where it took some years before editors appeared which could be used by non-experts.

A high level interface such as that provided by LAMS is not only useful to interfaces intended for teachers. The MOT+ editor [28] (a proprietary application) is an editor for learning designers which uses a graphical editor to create courses following the MISA design method. The resulting designs can be exported to LD. This means that learning designers can use tools optimised for the methods which they prefer, and maintain interoperability. The DialogPlus toolkit takes a similar approach, enabling authors navigate through a pedagogic taxonomy (which does not follow the structure of LD). At present the development team are working on exporting to LD the pedagogic structures defined in DialogPlus.

Authors also need to validate their UOLs, to be confident that they are fully compliant. Some editors ensure that only valid UOLs can be created, and the CopperCore Learning Design Engine (see next section) also performs validation.

2. *Runtime tools.* An LD player application accepts a UOL as an XML file, and interprets it to provide learners with the appropriate resources, services and activities as they work. This is not a straightforward process. Firstly, information has to be added before learning can commence. A UOL is an abstract representation of a pedagogic structure, and in simple terms it may be considered an interoperable lesson plan. Each time a cohort of learners use a UOL for learning this is called a run. Before a UOL can be run information has to be added about the specific learners and teachers who will be involved, dates may need to be specified, and services may need to be set up. It is assumed that much of this will be done automatically, reading from databases which maintain this information in other parts of the providing institution, but at the operation can also be carried out using the Clicc application, produced by the Open University of the Netherlands and distributed with CopperCore (see below). This has a command line interface, making the learning curve for using it rather steep, but a new interface is under development.

Secondly, once a specific run is populated with users and other necessary information, the player application has to keep track of states of all the learners as they evolve, and provide the appropriate resources and activities over time. Implementing such a system is a major task, and the OUNL has made a substantial contribution to player development by providing the CopperCore Learning Design Engine. This application handles all the underlying processing in the complex core of the player, but provides only a simple user interface. It is intended as a tool for developers which enables them to build on the engine and focus on providing innovative interfaces for players. CopperCore is also a reference implementation of a player engine (as discussed above), and provides a guide for later implementers who want to know how certain aspects of the specification should be interpreted.

Work has also been carried out towards wrapping CopperCore in a service layer in the SLED Project funded by JISC (Joint Information Systems Committee) in the UK, opening the way to a range of new applications.

One particular kind of player which is required is a viewer for authors, so that they can preview a UOL with dummy users as they are working on it. If this is not available then the UOL has to be populated with users before it can be loaded into a player such as CopperCore. The RELOAD team have provided a player of this sort [18], which should perhaps be more correctly termed a viewer.

Another runtime application which will be required is a repository of UOLs. Any learning materials repository can be used, but it would be useful to add specific LD features to help users identify the most appropriate UOL for their purposes, using graphic representations and/or controlled vocabularies. The problem here is largely one of understanding what those representations and vocabularies should be, and the answer to this can only come through practice. It is therefore not surprising that these features have not yet been implemented, but as the technical implementation is not especially challenging this should not hold up completion of the infrastructure.

## V. CONCLUSIONS

The most significant FOSS applications for LD currently available or under development are as follows. The web addresses are as of April 12 2005.

### 1. Currently available

#### **Editors**

- Reload
- aL.Fanet LD Editor
- CopperAuthor
- MOT+ (soon to be open sourced)

#### **LD Player Engine**

- CopperCore

#### **Players**

- CopperCore has a simple player incorporated
- RELOAD viewer

#### **Tool for populating UOLs**

- Clicc (included in CopperCore)

### 2. Under development

#### **Editors**

- DialogPlus
- ASK LDT
- COSMOS

#### **Editor / Player**

- LAMS

#### **Players**

- SLED Service wrapping for CopperCore
- Alfabet player

The FOSS infrastructure for eLearning described above is a huge enterprise, and it will not be possible to assess the final results for a number of years in the future. The infrastructure for Learning Design has, however, reached the point where use of the specifications is a viable option, with the critical open source applications already in place. The key targets for future development are clear, based on the architectures established by the Valkenburg Group, and there is an active community working on applications. The wider FOSS framework initiatives such as ELF, OKI and SAKAI encourage us to believe that this technology is

becoming embedded at a strategic level, and that the emerging FOSS infrastructure for LD will be part of an overarching FOSS infrastructure for eLearning. There remain a number of needs to be met which would facilitate adoption of LD. In particular easier to use high level authoring environments and templates need to be developed, more varied and sophisticated player interfaces provided, together with repositories with specific LD features. The provision of applications which ease the administration of LD systems and their integration with enterprise systems in education institutions would also be very advantageous.

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## **November 30<sup>th</sup> : Workshop/ Online Educa Conference, Berlin**

This workshop featured as part of the pre-conference event and went under the title of: “**Did you hear the one about the ELF? the model and the learning technologist? E-learning Reference Models explained and examined**” The workshop focused on reference models and was led by Dr. Peter Douglas, Intallect Ltd., UK, Dr. Charles Duncan, Intrallect Ltd., UK, Peter Rees Jones, University of Leeds, UK & Dr Colin Tattersall, Open University of the Netherlands, The Netherlands.

The workshop featured a number of reference model projects and examined their relationship to the ELF toolkit, to demonstrator projects, and to the UNFOLD project.

The agenda included the following presentations:

### **Agenda**

- Introduction to ELF and reference models, aims and objectives
- Individual reference models
- FREMA
- LADIE
- COVARM
- XCRI
- ELF toolkit and demonstrator projects
- UNFOLD
- Discussion of reference models

### **Target Audience**

The audience was made up of Learning Technologists, IT specialists and those interested in interoperability issues between IMS and other standards related systems. Participants were required to be familiar with the learning technology standards, with particular focus on Learning Design (<http://www.imsglobal.org/learningdesign/>) as well as with the principles of web services and service-oriented approaches.

### **Outcomes**

This seminar aimed to disseminate the work of UNFOLD, 4 of the reference model projects, namely LADIE, FREMA, XCRI and COVARM, ELF toolkit and demonstrator projects and to benefit from the viewpoints of the wider e-learning community.

Resources and presentation materials used for the workshop can be found at the following URL: [<http://hdl.handle.net/1820/509>]

## ***August 25<sup>th</sup> - 26<sup>th</sup>: The 2nd Conference on "ODL interaction": 1st International meeting on Educational Technologies 25th and 26th August 2005***

The Federal Center for Technological Education of Ceará in Brasil - CEFETCE Ceará, organized the 2nd Conference on "ODL interaction" which included the 1st International meeting on Educational Technologies.

The 1st Conference on "ODL Interaction" was held in CEFETCE Ceará in January 2005 and demonstrated the need to discuss the topics around the technological and pedagogical questions within ODL experiences.

The 2nd Conference on "ODL interaction" was organised by Prof Cassandra Ribeiro and Prof Cesar Olavo from CEFETCE Ceará. Prof Cesar Olvavo is one of the active UNFOLD members, he participated in the UNFOLD CoP event in Portugal and in the Vakenburg UNFOLD-Prolearn event.

Ana Dias of the University of Minho, Portugal gave a seventy-five minute presentation in Portuguese on the Unfold Project. The presentation was entitled: "UNFOLD Project: Accelerating the Adoption of IMS-LD". In relation to this event Ana also started a Portuguese speaking CoP on the LN4LD website.

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## ***October 19<sup>th</sup> SPDECE keynote presentation on UNFOLD and IMS-LD 2005, Barcelona***

SPDECE is a Spanish conference on eLearning with a particular focus on Learning Objects. Following the UNFOLD presentation at SPDECE 2004, and the subsequent publication of the paper presented in RED Revista de Educación a Distancia (<http://www.um.es/ead/red/M5/>), UNFOLD was invited to provide a keynote presentation to the conference. This was delivered by David Griffiths of Universitat Pompeu Fabra, and is available at <http://www.uoc.edu/symposia/spdece05/ppt/IDPL2.ppt>

## **November 13<sup>th</sup>: IMS Content Packaging Meeting, Heerlen, Netherlands**

The current working group on the new version of the specification IMS Content Packaging met at The Open University of The Netherlands in November 13<sup>th</sup> and 14<sup>th</sup>, 2005. Along the two days on intensive work the group addressed several hot topics around the forthcoming version 1.2 to be released in April 16<sup>th</sup>, 2006, and they agreed on several issues concerning external manifests, submanifests, external links, multilanguage support and others. Besides, a weekly conference call is held to track and encourage the development process of every member in the group. All the discussions and documentation about the several meetings and outcomes are available at

[<http://members.imsglobal.org/forum/ims/dispatch.cgi/f.packaging/AVFLoginForm>].

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## **November 15<sup>th</sup>: Lornet, Pre-conference tutorial and participation in symposium Vancouver, Canada**

LORNET is a Canadian initiative in which research is organized around 6 themes, each grouping 3 to 6 projects, integrating the TeleLearning Operation System -TELOS. The UNFOLD project was invited to have a strong presence at the LORNET conference I2LOR-2005, which took place this year in Vancouver. The conference gathered more than 130 researchers, partners and students from the LORNET network and many field professionals. Distinguished researchers and key note speakers took also part to the conference.

Three representatives of UNFOLD took part in the conference. Rob Koper provided a remote key note presentation, and Dai Griffiths participated in a Learning Design Workshop with regiuñar UNFOLD participants Griff Richards of Simon Fraser University and Ileana de la Teja of LICEF.

Dai Griffiths also presented a paper *Print to pixels: the implications for the development of learning resources* which is available on the DSpace server. Dai Griffiths was also a judge of the demos and posters by graduate students.

Finally there was a symposium on Strategic Collaborations for e-Learning, jointly organized by LORNET and the Canadian Council on Learning, in which Dai Griffiths made a presentation on UNFOLD, and Bill Olivier of JISC also participated telematically. Dai Griffiths paper to LORNET is reproduced below:

*Presented to LORNET 2005, Vancouver*

## **Print to pixels: the implications for the development of learning resources.**

**David Griffiths, Universitat Pompeu Fabra**  
**david.griffiths@upf.edu**

### **Abstract**

In this paper we reflect on the implications for pedagogy and infrastructure of the move from paper based resources to digital learning resources. A model of production of paper based educational resources is proposed, and the way in which the move to electronic educational resources has interfered with this process is outlined. Some of the negative implications of these changes for pedagogy are explored. Some approaches available to resolve the interferences are identified. IMS-LD is identified as a key technology, and drawing on the work of the UNFOLD project the concepts underlying the exchange of chunks of pedagogy, and institutional policy regarding copyright are discussed. Conclusions are offered summarising the most promising approaches and the issues to be addressed.

### **Introduction**

Littlejohn (Littlejohn 2003) describes how *numerous national and international initiatives have been funded to investigate ways in which digital learning resources might be developed, shared and reused by teachers and learners around the world (so as to benefit from economies of scale)*. The idea of sharing and reusing learning resources, however, is at least as old as the book, however, and as Downes has pointed out (Downes 2001) “today’s classroom is already an example of extensive resource sharing”. So it seems that we are confronted with a major initiative to implement an established practice (sharing learning resources) in a new context (digital technology).

This has been successful in many respects. There are many commercially produced digital learning resources, and many web pages produced by learners and teachers. Digital resources have many advantages, e.g. interactivity, no printing costs, improved access, and learning situated within learners' technical environment. Nevertheless it seems to me that in the move from paper to pixels something of great value has been lost. This paper proposes a simple model which helps to clarify this, and identifies current technologies and approaches which can help in recovering the processes which have been lost in the move to the digital domain.

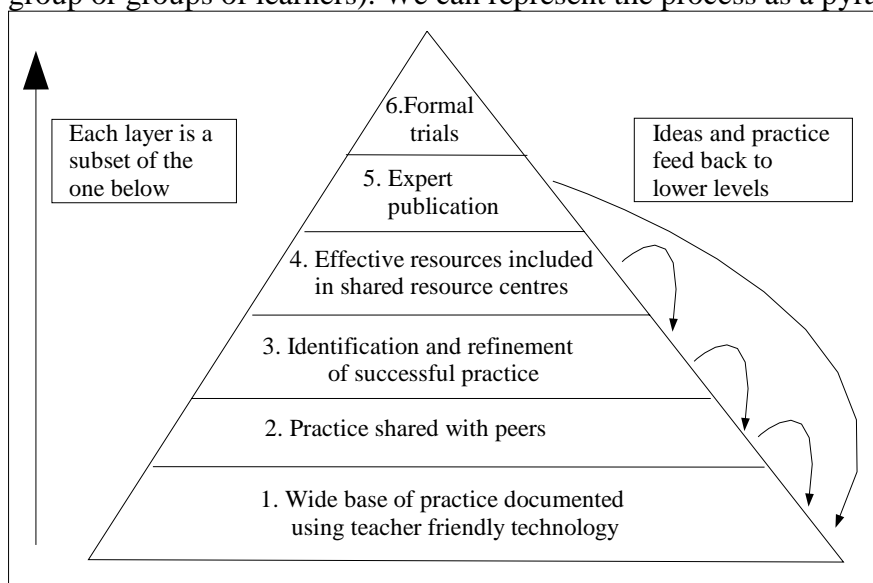
Twenty years ago I was studying a Postgraduate Certificate in Education, and in great need of help in planning for my teaching practice in schools. I was fortunate to have access to an Educational Resources Centre, a large room whose walls were covered by shelves containing box files full of classified lesson plans and resources contributed by teachers and some of the more successful students. Any teacher or student in the area could take advantage of this huge pool of documented practice in a wide range of subjects. Often the learning resources would be duplicated using cyclostyle machines, ready for use. There were many more resources are found than can possibly be used, and as students we would sometimes browse categories of resources until something useful appeared, but often we would rely on word of mouth recommendations, and the most successful lesson plans and resources became refined and widely used. Similarly in departments in schools teachers would ask their peers for suggestions for ways to approach tricky subject matter or teaching problems. In this way useful teaching strategies could be shared among practitioners and the most effective became more widely used. When excellent teachers became teacher trainers or authors of course books, these strategies were made available in a high quality format to the wider school community. The effectiveness of some of these



resources can be evaluated in full scale trials (although research, and particularly action research, is also appropriate at all levels). Thus, for paper resources, there is a continuum between individual resource creation, and professional publication, mediated by appropriate technologies and social structures, and ensuring that shared and published resources are rooted in practice. We can look in vain for equivalent structures in the digital domain.

### The resources pyramid

Summarising the scenario described above, there is a wide base of practice which can be produced by any teacher. The results can be shared by practitioners and gradually be filtered to inform a much smaller set of resources which are professionally published. The creation and refinement of resources is (inevitably) informed by explicit or implicit theories of learning, but the resources progress up through the layers of the pyramid is determined by pragmatic factors (i.e. are they useful in the classroom with a particular group or groups of learners). We can represent the process as a pyramid:



*Fig 1: The resource pyramid: a model of publication based on shared practice*

Please note that a) it is not claimed that all paper based educational resources are produced in this way, only that the process is available and enabled by the technology, and b) materials at the top do not necessarily produce better learning for a particular group of learners than those at the bottom, but they will be useful to and reusable by many teachers. What happens to the pyramid with digital resources?

When working with digital materials resources barriers appear in the four lower sections of this pyramid, all of which concern the creation and sharing of resources. Taking each layer in turn:

*1 Raising the bar of technological competence.* Many teachers do not have the technical skills to create a simple web page, have insufficient or obsolete computers in the classroom, or do not have the skills to manage a class in working with online resources. In these circumstances it is very difficult to achieve wide base of teaching practice using digital resources. Moreover the effort involved in creating even a simple web page (when compared with a photocopy) means that creative flashes and quick solutions are less likely to be documented in digital materials.

*2 Infrastructure for sharing resources.* Processes which are easily managed on paper require a technical implementation and interoperability specifications if digital resources are used. On the other hand, if these conditions are achieved, the scope for sharing is greatly increased.

3 *Lack of reuse.* The refinement of learning resources depends on reuse. This is well established for paper based resources and lesson plans, and (while bearing in mind the restrictions of point 1) is become more frequent for digital learning content, but it is not common for lesson plans or other representations of practice.

4 *The copyright regime* in an online environment has an impact in two ways:

a) sensitivity to copyright infringement is much greater in an online environment, even when a “fair use” interpretation is applicable, because of the threat of legal action from copyright holders. A photocopied diagram or a recording used in a classroom attracted no attention, but the same diagram placed on the web will create problems, as described by (Lessig 2004)

b) some educational institutions would agree that “The ultimate goal of content providers and producers is to increase the value of their content to maximise return on investment” (Degen 2001), and may consequently restrict teachers from sharing their own products.

### **The drift to programmed learning**

The breakdown of the pyramid in the move to digital technology, as described above, logically results in a drift towards programmed learning<sup>3</sup>, for three reasons.

1. Interoperability specifications are needed to support the sharing of resources. SCORM is the most widely adopted specification, and its functionality corresponds closely to the definition of programmed learning as an “educational technique characterized by self-paced, self-administered instruction presented in logical sequence” (Encyclopedia Britannica). There is nothing intrinsically wrong with SCORM compliant materials, and teachers can (and do) use the resources in many other ways, but as there is no standard way to describe that use it is hard to share this practice online.

2. Creating digital resources is technically challenging for the majority of teachers, and so they use the materials they can find. Current metadata and search engines lead them mostly to simple documents or SCORM objects, as there is no widely adopted machine readable description educational activities and pedagogies.

3. If an education provider sets up a resources repository they are confronted by a complex task in checking all the contents for copyright infringement. They will have less legal issues to resolve if they distribute materials which they have bought from a publisher, who takes responsibility for checking on copyright infringement. These materials are, at present, largely SCORM based.

How can the base of the pyramid be restored?

It is not claimed that programmed learning is bad, or even that other approaches might be better, simply that there is a need to avoid leading teachers to adopt a particular approach for technical rather than educational reasons. The reconstitution of key sharing aspects of the pyramid in the digital context will enable the whole range of learning resources (not just content) to be rooted in the creativity of teachers’ practice and developed in collaboration with peers. To achieve this is necessary to intervene at the conceptual, technical and policy levels. In a complex system such as this such interventions are systemic in their implications, and their resolution requires action at a number of different levels, not simply the introduction of a new application or workflow.

### **Infrastructure for sharing resources**

The technology available to enable sharing of digital resources has greatly constrained sharing, and we devote a substantial part of our discussion to this issue. Paper resources are used by all learners and teachers, and they have certain advantages (all learners and

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<sup>3</sup> an "educational technique characterized by self-paced, self-administered instruction presented in logical sequence" (Encyclopedia Britannica Programmed learning. **2005**.

teachers have the skills to make them and duplicate them, and they can be exchanged and stored without any special technical requirements) as well as disadvantages (they can only be shared with people who share the same geographic location unless they are physically transported, copying can be expensive, and adapting them is complicated when compared to creating the original document). For digital resources the situation is almost the exact reversed. In order to share digital resources effectively an infrastructure is required, with accepted specifications for interoperability. In this regard HTML has been a major step forward in providing universal means of exchanging documents. The SCORM application profile (consisting principally of IMS specifications) has been widely adopted, and adds some valuable functionality, enabling the resources to be sequenced, described with metadata, include assessments and monitor use. SCORM does not, however, represent how multiple learners and teachers work with the resources in different activities. IMS has produced the IMS Learning Design specification (IMS-LD) to meet this need, and this is a key technology in addressing the problems we have identified. IMS-LD defines Units of Learning (UOLs) by representing how *people* carry out *activities* in an *environment* composed of learning resources and services. IMS-LD is a large and complex specification, and interested readers can find detailed information in (Koper and Tattersall 2005). The functionality offered by IMS-LD is still unfamiliar to many educationalists, so we here identify four aspects developments around the specification which are relevant to this paper.

- *An Educational Modelling Language.* IMS-LD emerged from work done in the Open University of the Netherlands (OUNL) (Koper and Tattersall 2005) when it was decided to move all its courses online, while maintaining the wide range of pedagogic approaches used. All existing Virtual Learning Environments<sup>4</sup> (VLE's) created limitations, and so it was decided to create an in house system. An attempt was made to create models of the key pedagogic approaches, but it soon became evident that this would be a never ending task, as the variety to be handled approached that of the number of courses taught. The solution was an Educational Modelling Language (OUNL-EML) with an XML binding which could be used to define a very wide range of pedagogic models (Koper, Hermans et al. 2000). This language was then adapted and adopted by IMS as the base for their Learning Design specification (IMS Global Learning 2003)

- *An eLearning methodology.* The OUNL started to use OUNL-EML in their online teaching, and indeed it is still in use today, and a methodology also had to be developed to support the creation and use of UOLs. The OUNL methodology was also adapted to the requirements of the new specification, and is included in the IMS Learning Design Best Practice Guide (IMS Global Learning Inc 2003)

- *A set of applications.* UOLs were developed for OUNL-EML using FrameMaker<sup>5</sup> and the EduBox player (see (Koper and Tattersall 2005)) was developed to run them. Since the publication of IMS-LD there has been an initiative underway to produce tooling for the new specification, which has been coordinated by the Valkenburg Group<sup>6</sup> and by UNFOLD<sup>7</sup>, a coordination project funded by the European Commission. Many applications are now available, including Open Source initiatives such as the RELOAD<sup>8</sup> editor and the CopperCore<sup>9</sup> learning design engine. An updated list of applications is available from the UNFOLD website.

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4 Also known as Learning Management Systems (LMS)

5 <http://www.adobe.com/products/framemaker/main.html>

6 <http://www.valkenburggroup.org/valkenburggroup-org.htm>

7 <http://www.unfold-project.net> and <http://moodle.learningnetworks.org/>

8 <http://www.reload.ac.uk/>

9 <http://www.coppercore.org/>

- *An interoperability specification.* The mission of IMS is to create interoperability specifications for eLearning, and so, by definition, that is what IMS-LD is. Its purpose is to enable applications to exchange UOLs, and to ensure that learners working on the same UOL using different applications on different platforms will be organised in the same way, and will participate in the same learning activities with the same resources. IMS-LD does not constrain how eLearning applications should work, it only specifies an import and export format which they must be able to work with if they want to be IMS-LD compliant. Thus, at the risk of oversimplifying, a UOL can be seen as an interoperable lesson plan. The use of IMS-LD therefore does not require the use of a particular methodology or infrastructure, as demonstrated by MOT+ (Paquette, de la Teja et al. 2005), and work in progress with the LAMS<sup>10</sup> and the Moodle<sup>11</sup> community.

With this understanding in place we can now consider how IMS-LD can help to reconstruct the Resources Pyramid, and two aspects can be distinguished, modelling and sharing practices, which require different tooling.

### Modelling practice with IMS-LD

IMS-LD is the best established Educational Modelling Language and so it addresses the need in **layer 1** of the pyramid for a means whereby teaching **practice can be represented and documented in a machine readable format**. It should be noted, however, that this layer specifies *teacher friendly technology*, and at present IMS-LD is far from being as teacher friendly as HTML, let alone a photocopier. In part this is due to general problems with both the design of computer interfaces and teacher's levels of skills, but it is also clear that the interfaces of the applications available to work with IMS-LD editors are only appropriate for professionals or for enthusiasts who are willing to spend the time learning them. Progress is, however, being made towards usability, and for a discussion of these issues see (Griffiths, Blat et al. 2005) and (Griffiths and Blat 2005).

Teachers cannot be expected to spend additional time in preparing resources for sharing, so strategies must be sought which make their work *easier*, and as a by product also produce interoperable and sharable resources. This is the case for two interesting programs which advise teachers on pedagogy, and provide them with suggested lesson plans, which are represented in IMS-LD: LearningMapR (Buzza, Richards et al. 2005) and the CEPIAH project (Trigano and Pacuar-Giacomini 2004) which has produced the NetUniversité system<sup>12</sup>. Similarly an opportunity is presented by the pressure on teachers in some countries (eg the UK) to do more in documenting their teaching in order to strengthen accountability standards of teaching. For example a well designed lesson plan editor which used IMS-LD as its file format would do much to generate a resource base of sharable practice. Finally IMS-LD interoperability has the potential to transform the situation, if for example LAMS and Moodle users can create UOLs easily.

### Sharing practice with IMS-LD

**Layer 2** of the pyramid refers to **sharing practice**, and IMS-LD is also valuable in this respect, providing a means of exchanging the practice documented in UOLs. Following the terminology used in an UNFOLD discussion paper (Griffiths 2005) an **Exemplar UOL** is an example of how to resolve a problem in Learning Design. The focus of the problem could be technical (e.g. how to include a QTI evaluation in a UOL) or illustrate a pedagogic approach (e.g. the Versailles Negotiation (IMS Global Learning Inc 2003). The exemplar is the UOL itself, complete and ready to run. A **Learning Design template**, like a template in any other aspect of computing, is a partly completed file to which the user

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10 <http://www.lamsinternational.com/>

11 See the discussions on <http://moodle.org/>

12 <http://www.cepiiah-hds.utc.fr:8080/CEPIAH/web/index.jsp>

can add data. A template can be made from any UOL, but it only makes sense to make a template from a useful and reusable UOL. Thus a template may be seen as a partly completed exemplar, with place holders where information is to be added.

UNFOLD has created a set of templates documented as follows:

- A narrative, (free text description of the learning activities)
- A lesson plan (with no LD specific aspects)
- A worksheet (one step nearer to LD)
- A walk-through (Screen shots from UoL)
- The example UoL itself (an exemplar)
- A part completed UoL to be filled in.

The interface provided for filling in the completed UoL is not part of the template and it could be a general purpose editor, or a specialised application.

Teachers do not only exchange complete lesson plans, they also exchange useful documents and activities (at various levels of detail). If such exchanges are to be mediated by computers then a rigorous machine readable description will be required at a lower level of granularity than the UOL. For items of learning content SCORM provides a viable solution, but defining and describing activities in an interoperable way is more challenging. Participants in the UNFOLD Teachers and Learning Providers Community of Practice have been sharing their approaches to sharing useful chunks of pedagogy, and the principal concepts used are outlined in a discussion paper *From Primitives to Patterns* (Griffiths 2005) which is the basis for the following discussion.

### Sharing activities

One approach which is being explored is the exchange of IMS-LD *activity structures*. The word “activity” is open to some misinterpretation. As Koper has pointed out (Koper 2005) activities are sometimes taken to mean “an opportunity for someone to do something”, such as a the sport of basketball. Similarly, in online education a chat environment or a conferencing system could be thought of as an activity which is available to users. In IMS-LD, however, an activity is understood in the psychological sense, as “that which is done by the person”, while the context which provides the opportunity for this to happen is an environment. An IMS-LD activity has its own learning-objectives, prerequisites and metadata, and typically refers to learning objects and/or services to be used. There is also an activity-description, which provides information and instructions about what the user should do. Activities can be grouped into *activity structures*. Since IMS-LD Activities are separate from Roles and Resources so they are potentially reusable resources. The fact that “nuggets” (see below) exported as IMS-LD fragments can be imported in the RELOAD Learning Design Editor indicates this is a viable approach.

The concept of the learning activity *nugget* was introduced by the work of Southampton University in the Dialog+ project. According to (Conole 2005) the project arrived at this definition of a learning activity, in consultation with practitioners. A detailed taxonomy of learning activities was produced, building on previous work (for example, upon Laurillard, Vygotsky, Bloom etc). Similarly Sarah DeFreitas work on learning activities and Laurillard’s work on tools is used. Using the toolkit a practitioner can define learning activities, and produce a plan for a lesson or part of a lesson. The sequence of activities defined in a nugget is congruent with an activity structure in Learning Design, and sdo it has been possible export out of Dialog+ to a Learning Design activity structure and import into RELOAD LD Editor. This is a very encouraging development for the exchange of practice mediated by IMS-LD.

Casey uses the term *primitive* to refer to a related concept (Griffiths and Blat 2005), drawing on computer science, where it is used to refer to datatypes provided by a programming language as basic building blocks.. Similarly in 3D design a primitive is a basic structure which can be combined with others and refined. Applying this concept to

pedagogy Casey indicates an interactive event in a classroom, such as “discuss this text” or “research this topic on the web”, indeed any basic element which may be useful in any context. The identification of a set of primitives depends on decisions on how to divide the continuum of educational practice into chunks, a debate which can most effectively be conducted by a community of teachers, and which is in itself a potent training approach. The result is a rougher, more tentative approach to pedagogy, which is not based on a particular theoretical perspective. This closeness to practice has the potential to provide a set of concepts which support effective discussions about practice. As with nuggets, it is proposed that these structures can be represented in IMS-LD.

### Sharing patterns and good practice.

The concept of *pattern* is not always clear, and it has been the cause of considerable debate within UNFOLD. Many people use the term “pattern” to indicate an example of best/good practice<sup>13</sup>, for example the Pedagogical Patterns Project states that “Patterns are designed to capture best practice in a specific domain. Pedagogical patterns try to capture expert knowledge of the practice of teaching and learning” (Pedagogical Patterns). The eLEN project takes a similar line: “Design patterns in e-learning are descriptions of good practice in e-learning” (E-LEN project 2005). This approach does not match the idea of a *pattern language* as originally formulated by Alexander: “A pattern language gives each person who uses it, the power to create an infinite variety of new and unique buildings, just as his ordinary language gives him the power to create an infinite variety of sentences” (Alexander 1979) p. 167. Each pattern addresses a problem and provides a solution, but Alexander’s formulation stresses that the point of patterns is not to lead to automatic reuse, but rather to support creativity. In the context of pedagogy this would imply supporting teachers engagement with pedagogic problem solving, rather than providing ready made solutions. McAndrew, Goodyear and Dalziel (McAndrew, Goodyear et al. 2004) propose that this model provides the basis for a pattern language for learning, with each pattern consisting of expository texts, such as the example below:

<p><b>Pattern: COLLABORATIVE EVALUATION</b></p> <p><b>Context:</b> A group of learners need to understand the principles behind a particular technique so that they can progress to become able to select particular implementations for others and to be able to take part in producing further examples themselves. Such learners need to develop an appreciation of the different forms available, the structure they have and why particular forms are suitable for some tasks.</p> <p><b>Body:</b> The contradictory challenges in this are the need to understand the structures that have been used alongside the need to see new ways to do things. The breadth of what is available needs to be examined alongside understanding how the software might apply when used in depth. It is important to balance individual views with group views and established positions from literature and other sources.</p> <p><b>Solution:</b> Building a collaborative evaluation enables the sharing of the work load and brings in the views of others to enable testing of consensus and variation in the depth that each individual may look at a particular example.</p> <p>It is associated with patterns for LEARNING THROUGH DISCUSSION, COLLABORATIVE LEARNING and NETWORKED LEARNING PROGRAMME. It builds on patterns for DISCUSSION GROUPS, DISCUSSION ROLE, FACILITATOR, DISCURSIVE TASK, SEARCH, and CONSENSUS FORMING.</p>
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From (McAndrew, Goodyear et al. 2004) Fig. 8 *Collaborative Evaluation as a Pattern*

This difference in interpretation of the terms may not seem very profound, but it can have a major impact. In a paper based environment a teacher can take a description of a pattern and apply it as she or he sees fit, but if they are working with a VLE this degree of flexibility will not be available, as the representation of the pattern and its functionality

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My thanks to Davinia Hernández Léo for pointing this out in UNFOLD online discussions

will be explicit and restricted in order to be machine readable and interoperable. Consequently, the definition of the terms used has to be more rigorous when working with online learning resources and activities. If we do not specify clearly if patterns are the same as, or different from exemplars of good practice, then there is a danger of duplicating the development of systems which have the same functionality, or providing inappropriate solutions for teachers and pedagogs, or both

### **Repositories which represent use**

From the above discussion it is clear that IMS-LD to facilitate the sharing which is needed to restore the resource pyramid in a variety of ways, but repositories are also needed to manage the process, and IMS has contributed by creating the Digital Repositories Interoperability specification (IMS Global Learning 2003). This paper not discuss repositories in detail, but instead refers the reader to the EduSplash (Hatala and Richards 2002) and LionShare (OKI Case Study 2005) projects. We do however note that in order to address the third level of the Resource Pyramid sharing alone is not sufficient. For the identification and refinement of successful practice it is also necessary for use to be represented. As far as possible this should be automatic, as it has been clear for some years that users are reluctant to add metadata to resources (Thomas and Griffin 1998). Automatic analysis can show teachers which resources are popular in their area / age group / curriculum. Lionshare uses the Shibboleth system developed by Internet2 to create flexible trusted communities and in such a context it may be possible to identify the individual teachers who have been using the resources, enabling teachers to emulate the practice of their peers. It is encouraging that LionShare is released under the GPL license and uses peer-to-peer technology. because it enables any group of practitioners to create a repository without needing to be authorised, helping to widen the base of available practice. It would also be desirable to ensure that reworkings of UOLs are associated with the UOLs on which they have been based, to permit browsing up and down the hierarchies of parents and children. In the short term this may be best achieved by observing good practice in naming and workflow, but it would also be interesting to explore the possibility of analysing IMS-LD code automatically to seek out similarities and hilite related UOLs, or UOLs where, for example, a similar activity structure is used. An annotation facility is important so that teachers can associate notes with UOLs commenting on their usefulness or otherwise, and making suggestions for adaptations. It should not be expected that all users would make use of this facility, any more than all users of paper resources provide feedback, but any information provided would be of great value.

### **Communications enabling infrastructure**

In a paper based environment the exchange of resources involves physical presence. This is of course a limitation, but the easy identification of fellow users in physical communities such as teaching departments, professional associations, libraries, etc. who can provide comments and recommendations is a key feature of the resources pyramid for paper based materials. When moving to an online exchange of resources it is technically possible to exchange a much larger number of resources (although this may be limited by the other factors which we have mentioned), but it is much harder to identify fellow users. This makes it harder to share comments and recommendations, and so it is important that the initiatives which we have identified to restore the resources pyramid are accompanied by a policies and implementations to promote online communities of practice among users. The power of such online communities is clear from the success which they have had in other domains, but it has not always proved easy to transfer this to educational context. From the perspective of our model we would expect that the most effective approach would be to a) integrate the communications infrastructure with the repository as much as closely as possible, so as to re-establish the link between resources and a social context,

and b) implement trusted communities which are related to professional groups, where users can receive information about other participants and exchange recommendations with them much as they would in a face to face conference.

### The chilling effects of copyright

As mentioned above, the intensification of the copyright regime and the restriction of “fair use” rights has had chilling effects on the exchange of digital materials, and particularly on level 4 of the Resources Pyramid, the inclusion of effective resources in shared resource centres. Lessig has described how current trends towards enormous penalties for copyright infringement have led institutions to reject any activity which could possibly be construed as illegal, even if the use is clearly covered by “fair use” clauses. The result is that activities which were perfectly accepted in a paper based world are becoming outlawed in the online environment. As Lessig (himself a lawyer) has shown how *the astonishingly broad regulations that pass under the name “copyright” silence speech and creativity* (Lessig 2004) p.197. He argues that the solution must in part be legal, but he also identifies the Creative Commons ([http://creativecommons.org/.](http://creativecommons.org/)) initiative as a key way to avoid the worst of the chilling effects: *Its aim is to build a layer of reasonable copyright on top of the extremes that now reign. It does this by making it easy for people to build upon other people’s work, by making it simple for creators to express the freedom for others to take and build upon their work. Simple tags, tied to human-readable descriptions, tied to bulletproof licenses, make this possible.* *ibid*, p.282. For this to be effective institutions need to be convinced that the Creative Commons licenses are sufficiently flexible and watertight to meet their needs (not a difficult task) and that their interests are better served by having access to shared and adaptable resources rather than in attempting to gain competitive advantage by selling their content (rather harder). Once this policy has been established teachers and learners will need support in their use of Creative Commons licenses at all levels of the pyramid. This implies guidance and easy interfaces for applying licenses to all their productions, clear indications of what rights are given to users of resources covered by the Creative Commons, and inclusion of license information in the metadata held by repositories.

### Conclusions

In this paper we have provided a simple model of the educational resource development process, and we have described why it is hard to instantiate this model in an environment where educational resources are electronic rather than paper based. We have identified and discussed aspects of ongoing research and development in the field of eLearning which may make this easier. We summarise our conclusions below, and stress that while they are related to the different levels of the pyramid, they are unlikely to be effective if taken in isolation.

<b>Reestablishing the resources pyramid: summary of approaches and issues</b>		
<b>Layer of pyramid</b>	<b>Available approaches</b>	<b>Outstanding issues</b>
<b>Layer 4.</b> Inclusion of effective resources in shared resource centres.	Peer-to-peer repositories which support different layers of trusted access encourage autonomous communities to set up resource centres. Awareness and use of Creative Commons at all levels of the educational resource production process is essential to avoid the chilling effects of copyright litigation.	The basic functionality of educational resources repositories is available in applications such as EduSplash and LionShare, but much remains to be done in integrating these with the functionalities identified in 3. below. Creative Commons has become widely used, but the argument in its favour has yet to be won at institutional level.
<b>Layer 3.</b> Identificatio	To help teachers identify successful practice the use of resources should be	The incorporation of these functionalities into educational repositories which can



<b>Reestablishing the resources pyramid: summary of approaches and issues</b>		
n and refinement of successful practice within an institution or Community of Practice	represented in repositories on the basis of machine generated data. Within trusted communities personal usage can be represented. Parent and child UOLs kept together. Annotation by users. Support for personal communication linked to resources.	handle IMS-LD has hardly begun. This is unsurprising as IMS-LD is the only educational interoperability specification which can represent a wide range of pedagogic practice, and only now are large numbers of UOLs being produced which may create a need for these functionalities.
<b>Layer 2.</b> Successful practice shared with peers	IMS-LD UOLs are interoperable and can be used to share practice. Range of sharable pedagogy items proposed (exemplars, patterns, good practice, activities, nuggets, primitives...) Free peer to peer repositories	Ability to combine chunks of practice other than full UOLs is starting to emerge, but more needs to be done to clarify chunks used, and to provide easy to use tools. Free peer to peer repositories are starting to be established, and their use needs to be researched
<b>Layer 1.</b> Documentation of wide base of practice using teacher friendly technology	SCORM can document educational content. IMS-LD is an educational modelling language which can document practice in a standard way.	Many teachers are still uncomfortable basic computing skills, and IMS-LD editors are far too complex for them. Interfaces which are simpler by an order of magnitude are required. Applications are needed which help in teachers' practice, and generate sharable models as a by product.

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## 6.3 Online discussions

### *June 6<sup>th</sup>: discussion of the CoP meeting in Braga*

Transcript from the UNFOLD server,.

This transcript has been edited by Dai Griffiths so as to group the contributions more coherently, and some other minor changes have been made to clarify the meaning.

Participant are encouraged to contact me to suggestions and corrections!.

The discussion was based on the report on the meeting, available at:

[http://www.unfold-project.net/about\\_folder/events/cops/portugal/](http://www.unfold-project.net/about_folder/events/cops/portugal/)

There were four main issues in this online discussion

[Patterns and templates](#)

[Enabling teachers to work with templates](#)

[Interoperability issues](#)

[Making changes in runtime](#)

**Dai Griffiths** Is there anything from the Braga meeting that you'd like to ask about? I was thinking of this chat as being in part an opportunity for people who didn't come to pick up on the discussions.

**Davinia Hernández** Dai, thanks a lot for facilitating reports and presentations regarding the CoPs meeting Braga via the UNFOLD website!!!

**Vu Hung** Yes, it's a very detailed report.

#### **Patterns and templates**

**Davinia Hernández** Yes! I'm here to catch up what I missed... did you discuss something related to patterns?

**Dai Griffiths** In Braga we were mainly talking about templates, and we didn't talk about patterns a lot. Maybe because some of the people who are working on patterns were not there. But we did have a discussion about it on the Thursday evening. It became clear to me that there's still confusion in the terminology. So some people mean templates when they say patterns. Some people don't. Then there are all the nuggets and primitives as well. So I'm just writing a discussion document to try to sort that out.

**Davinia Hernández** OK Dai, that may be useful... patterns can be also understood in different ways... I've seen Daniel's presentation on templates ;), I like it very much (and agree) the time line he presented :)

- Vu Hung** Do we have an exact definition of patterns?
- Dai Griffiths** Dawn and Les, are the UoLs you provide through LearningMapR "templates" or "patterns", or both or something else?
- Dawn Buzza** We still haven't [collectively] defined exactly what we mean by patterns, but we do see our templates as expressions of a pedagogical pattern for a learning activity - it's generic in that it is stripped of subject matter content.
- Davinia Hernández** Well, Alexander's definition, a pattern is a (common) solution to a recurrent problem
- Dai Griffiths** Patrick McAndrew said something very interesting which has stayed with me. In his view patterns should not resolve all of teachers problems, they should leave them with things to think about and decide.
- Dawn Buzza** I agreee with Alexander's definition and also Patrick's point - teachers should be able to use patterns as a starting place and should be able to adapt and build on them depending on their teaching context, subject matter, specific objectives, etc.
- Ana Dias** I managed to register in Collage and had a first glance. Is the Collage website already available from Unfold?
- Davinia Hernández** Yes, I think Dai added the Collage website to the list of LD tools. What's your vision of Collage in this sense (using patterns as a kind of template)?
- Dai Griffiths** That seems to me to be the key. Is a pattern something you use to think and design with to make something bigger, or is it an exemplar of a solution which you adopt (or not)
- Davinia Hernández** The first thing (something you use and particularize to your particular learning situation)
- Dawn Buzza** We see both exemplars and templates as helpful -- teachers are very unlikely to find an exemplar [which always has content embedded in it] that is a great fit for their purposes, but the template that describes the same learning activity without content is more easily adapted. The exemplars allow teachers to see how others have used the learning activity.
- Davinia** I agree, Dawn. Examples are very useful (often the most

- Hernández** useful) to catch up design ideas (and understand them better)
- DanielBurgos** About patterns. Sure, templates are not the ultimate answer to all the teachers' problems. They are just a tool, a support
- Davinia Hernández** The issue may be that patterns can be somehow a kind of template (I'm not consider that every template is a pattern)
- Dai Griffiths** Yes, Daniel and Rob were very clear that a "template" is a semi-complete UoL, which can be completed by the user.
- Patrick McAndrew** Hello - nice to find I have made a point - even before I logged in :-). We had a research meeting here in OUUK yesterday where we ended up talking about patterns and affordances. In a way these shadow LD and tool interoperability but for research at least and probably practitioner as well you seem to need more flexibility.
- DanielBurgos** In fact, nobody is inventing the concept of template from scratch. We can just take the examples of any Office-suite or any Multimedia-set and we get the same approach
- Dai Griffiths** Yes, you are right. It is just that the term tends to get expanded out from that straight forward original meaning.
- Ana Dias** The frontier between a Template and a Pattern is not so easy is it?
- Patrick McAndrew** I think though that the more complex terms of learning design and patterns are capturing people's imagination more than templates or lesson plans because they do imply something different. The implication is that they work in some sense. It doesn't directly follow but I think expectations lead that way. Alexander talks about the quality without a name in connection with the goodness of architecture.
- Dai Griffiths** I agree. I think that often when people say "pattern" they mean "really good template that represents excellent practice that you can use". There's often the implication that this is as part of a set of UoLs which provides you with a set of solutions for all contingencies. This is some distance from Alexander, I think
- Dai Griffiths** In LearningMapR, when the teacher has got the recommendation from the system, do you have any way for them to work with that and build on it? Or are you planning

that?

**Dawn Buzza** The "built-in" ability to work with and build on templates and exemplars within the LearningMapR will depend on the software we are able to develop [hopefully in partnership]. In the short term, we are hoping to incorporate or at least point to an LD editor for this purpose. As LMS systems become LD compliant, they will be able to modify the templates and exemplars they have selected for integration into their course.

**Davinia Hernández** Dawn, you can have a look our Collage editor (it is quite modest but LDs can be created by starting from a kind of templates that reflects patterns)

**Patrick McAndrew** Dawn, for varying LDs we built a very simple wizard to take a design and transform it (essentially XSLT on XML) not sophisticated but had a lot of appeal.

### Enabling teachers to work with templates

**Dai Griffiths** Dawn, did you get the chance to see Ecaterina's work on netUniversité? In some ways it's parallel to your own work, in that it takes teachers through a set of questionnaires, and then generates a UoL. I haven't looked at it in detail, but I know that she's made a Java based editor which teachers can use to edit the recommended UoL. We didn't get to see it in action, unfortunately, because the server was down. Has anyone had a look at it? Daniel?

**DanielBurgos** Yes, I ran netUniversité

**Dai Griffiths** How was the Java editor?

**DanielBurgos** It's promising and you can change features on the run and all the main content can be changed through forms. In fact, the interface is easy to use and the functionality gives a lot of flexibility and power to the end-user. Anyway, it's still under development

**Dawn Buzza** We're looking at the editor from netUniversite now, but our concern is to focus our attention on helping teachers design UOLs, with their specific needs, contexts, and objectives in mind, but without having to school them in instructional design theory. Up until now the focus of templates seems to have been how to help teachers use LD by providing an interface template that contains all the "boxes" for ID

theory-based activities to be described -but they assume that the teacher knows what to fill in the boxes.. This works for some, and the functionality is coming along really well. What we feel the direction should now be to build tools based on our [international, collective] knowledge of instructional design theory, which will allow teachers to find strategies to fit their needs, as they define those needs, but without their having to be conversant in ID theory.

**DanielBurgos** I completely agree. This approach you point out is the way it should be. A teacher doesn't need to know LD in depth

**Dai Griffiths** If I really like an activity structure in one of the templates that reflects a pattern, can I in Collage just grab that and use it my own UoL. Or do I have to work on the whole thing?

**Davinia Hernández** Not at the moment (that's part of our future work), you have now to work on the whole thing (but in reality the pattern is in the whole thing because the patterns implemented in Collage reflect learning flows)

### Interoperability issues

**Vu Hung** Perhaps Moodle will completely support IMS LD next year. What about LMS BlackBoard, everybody?

**Dai Griffiths** We don't have a good line of communication with Blackboard, It is being kept under wraps as far as I can tell.

**Vu Hung** As I know, BlackBoard will make use of some parts of EduBox. Is that right?

**DanielBurgos** About Blackboard. Yes, they use some of Edubox and have a deal with OUNL, but don't use LD, so far

**Dai Griffiths** I understand that Blackboard are planning to use stylesheets to transform LD into EML, and so that they could run UoLs on EduBox. But that's just my understanding...

**Vu Hung** Will IMS LD be refined to deal with group problem and add more tools specifications in a recent time?

**Dai Griffiths** Daniel may be better positioned to answer your point on groups and services. My understanding is a) groups as such are not a feature of LD, rather they emerge from the characteristics of the roles which are defined. So Moodle can talk about Groups, but these will be expressed as role parts

when they are exported to LD. b) yes there is work going on to creating a generic method for using tools with LD. Alex is your man for this conversation (if he is still here).

**DanielBurgos** Yes, we are working to add a layer of services to LD. But LD is not a LMS to carry out all the facilities that a LMS can do, don't forget it. A spec and an LMS are different things.

**Davinia Hernández** This layer of services is a kind of new mini-spec?

**DanielBurgos** In principle, It's just a kind of understanding between LD, Moodle and LAMS. A small working group. Depending on the results we could extend it and think of a mini-spec

**Davinia Hernández** OK, that's something Dai, Ernie and I discussed before Braga meeting by e-mail... I'm also interested in participating, if possible

**DanielBurgos** Participating in? services or runtime tracking?

**Davinia Hernández** The working group around services ;)

**Daniel Burgos** What is exactly the "group problem" in LD?

**Vu Hung** Will Moodle groups be able to model by using roles of IMS LD?

**DanielBurgos** Currently, you can group users in LD, but with a different behaviour and setting-up. The feature is there but the way to use it is different. i.e., in LD you build groups of five (or five by five, in cascade)

**Vu Hung** How many tools can be modelled using IMS LD services, e.g. forums, chat, journal?

**DanielBurgos** Simple: 0. IMS LD has no portal service: forum, chat, calendar, journal, wi-ki... In LD you have other services, like monitoring, search, email.. but the drive is different, I think

**Dai Griffiths** The issue has been if it makes sense to have an interoperability spec for things which you can't rely on finding in all LMS systems. The answer has been "No". But my understanding is that there is an approach being suggested that would give you a generic mechanism to set up the tool of your choice. Of course you might not find the



tool on the system your working on, in which case it obviously won't work. But that seems to be a good way to go.

**Vu Hung** When Moodle exports courses/topics to UOLs or something like that, how will we deal with tools of Moodle? Can other systems understand and reuse tools of Moodle?

**DanielBurgos** Tools will be taken separately. Depending on the tool it will be modelled inside LD or taken as an external module. But, please, don't go too much ahead. We are still thinking of it. Don't take it as a promise, just as a wish

**Vu Hung** OK! We'll wait to see the actual result. Thanks, Daniel and Dai.

**Ana Dias** Maybe Moodle integrating LD next year + LAMS tool will help the take up?

**DanielBurgos** Sure. Interoperability is the key of success. No doubt. If an open spec is not interoperable, what is it for? ;-)

**Dai Griffiths** I think it will give Blackboard and WebCT food for thought too

**Ana Dias** YES Dai, if moodle continues to lead the way then Blackboard and WebCt will follow by sure

### **Making changes in runtime**

**Davinia Hernández** Maybe Vu refers to the problem of interaction between designtime and runtime grouping that Rob pointed out in his presentation in Braga...

**Mark BarrettBaxendale** Talking of run time, Rob also mentioned run time editing. In my mind this is going to be something a practising teacher will want, to cahnge the design during a run, I don't see how we can currently support this

**DanielBurgos** You know that runtime for groups in LD is not the main strength. It's something to talk about but certainly not solved. Several things can be changed and adapted in run-time, but not all. Today a new UoL was uploaded to [\[http://moodle.learningnetworks.org/course/view.php?id=20\]](http://moodle.learningnetworks.org/course/view.php?id=20) (number 34) and I am working right now on a full example of personalization, for content and interface. You will have it

ready soon

**Mark  
BarrettBaxendale**

Yes I just looked at the eg, and this is a powerful feature of LD, no doubt, but I have to design in all possibilities. In reality I can't do that, I will have to adapt what I do as I'm doing it

**Mark  
BarrettBaxendale**

Thanks Daniel, but I mean the actual design, things that we hadn't foreseen

**DanielBurgos**

Learning process, you mean?

**DanielBurgos**

Changes on the learning process, modifications or qualifications are not allowed, I am afraid. Everything has to be planned before. But you can let specific things open to be filled on the run. It's not the best stage but it's a step, I think

**Dai Griffiths**

There are two things here: a) the things you can do with CopperCore, Reload, etc, which is LD from the ground up, so to speak. b) if you use IMS LD as an interoperability spec there is nothing to stop you importing your learning design into "application x" and then introducing as many run time changes as you want. Or am I over simplifying?

**Mark  
BarrettBaxendale**

That's fair enough but I think it would be good in the future if we could spawn new LDs in the light of actual practice, as we do it. Maybe Dai is right it's simply a matter of tooling

**Dai Griffiths**

When you say "spawn UoLs in the light of actual practice", do you mean that you would have a system with a range of possible learning activities, the teacher would choose them, and then the decisions would be documented and generate a UoL?

**Mark  
BarrettBaxendale**

I'm thinking of the unforeseen, the learner that I need to take a different approach with. Say I want to simply add in an activity. My understanding is I have to republish and then I lose the state of the run. Actually your description fits the scenario, yes we could select existing activities, but if we hadn't preplanned for every eventuality we'd be stuck

**Dai Griffiths**

I know that there is wriggle room here, because I've heard people who understand such things talking about the limits of changing things on the fly with CopperCore. But I don't know what they are. I'd just repeat that if you want to do something that CopperCore can't do, you can just build your own system, with import and export of UoLs, and whatever you want happening inbetween. But it'll be a lot more work

than using CopperCore if you are doing it from scratch!

**DanielBurgos**

I agree. I am convinced that we are in a very early stage of LD tooling and that sooner than later real user-centered tools will come up to fulfill user-needs, on editing, course management and so on (for instance, an LMS based on IMS LD or a really graphical editor)

**Mark  
BarrettBaxendale**

I think that's when things will really get exciting and is what we need for this to really get taken up

**Winding up...**

**Dai Griffiths**

Any more thoughts or questions? I'll edit the chat and post it. And we can carry on in our brand new forums on LN4LD

**Dawn Buzza**

Okay - thanks Dai, and others for great ideas and discussion. Bye.

**Dai Griffiths**

OK then, thanks for coming along (especially to Dawn and Les if it's as early in Canada as I suspect!)

## **September 28<sup>th</sup>: Discussion on JIME special issue – Advances in Learning Design (<http://jime.open.ac.uk/2005/01/>)**

### **About this transcript:**

This transcript has been edited by Dai Griffiths. I have removed most of the purely social exchanges, and organised the discussion into threads which follow the flow of the discussion. This was not always easy, and may give a distorted picture of the content of the discussions. In particular it might appear that Dialog+ and MOT+ were hardly discussed, but in fact you will find them mentioned extensively in threads which started on other topics. Any comments or requests for changes are welcome!

The links in the papers below lead to the relevant sections of the discussion.

**Introduction by Colin Tattersall** Welcome everyone to this UNFOLD online chat on the recent JIME special issue "Advances in Learning Design". We have a number of people on the panel representing at least 5 papers from the special issue. The panel members are available to respond to questions you might have on the articles, although you are also welcome to pose questions which touch on more than one of the articles. (Don't forget that JIME also has a forum facility for each paper and remarks can also be posted there.) All the papers were represented at last week's joint ProLearn/UNFOLD meeting in Valkenburg and if you were there too, this may have prompted new questions or remarks. I'd like to avoid putting too many constraints on the flow of the chat initially, and I'll let things develop. If the dialogue starts to get too messy I'll step in and try to focus on one of the open questions. Given that questions might be directed at specific papers and to help those of us who (still) don't type very quickly could I ask questioners to preface their question with one of the following labels?

Paper1: Francis Brouns, A first exploration of an inductive analysis approach for detecting learning design patterns

Paper2: Manuel Caeiro-Rodríguez, Towards a Benchmark for the Evaluation of LD Expressiveness and Suitability

Paper3: Alex Little, Developing an approach for Learning Design Players

Paper4: Ileana de la Teja & Karin Lundgren-Cayrol, Transposing MISA Learning Scenarios into IMS Units of Learning

Paper5: Dawn Buzza (plus co-authors), LearningMapR: A Prototype Tool for Creating IMS-LD Compliant Units of Learning

Paper6: Karen Fill: a learning design toolkit to create pedagogically effective learning activities

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**Paper1: Francis Brouns, A first exploration of an inductive analysis approach for detecting learning design patterns**

**Colin Tattersall** Although I'm interested in patterns, I'm also interested in raw data. I liked seeing the numbers in table 1 (numbers of elements). Any chance we could somehow

get something like this automated in the UNFOLD UoL repository? I'd like to know simply how often people use more than one ACT.

**Francis Brouns** It has been some time now, but yes I do not see why it would work with the Unfold UOL repository

**Francis Brouns** The first analysis has been done on OUNL courses. There were reasons why people never used more than 1 act.

**Colin Tattersall** Is that "I do not see why it would not work"?

**Francis Brouns** The main reasons are that people were new to learning design

**Francis Brouns** Yes, I do not see why it should not work. It is a relatively simple Java application that traverses the DOM tree

**Karin Lundgren Cayrol.** To Francis: Testing the MOT+imsld editor with experienced online designers the IMSLD concepts were confusing to them. It seems we need some type of bridge to make easy for course designers/practitioners to acquire these concepts.

**Francis Brouns** Yes you are right. It is a big step for teacher to start thinking about their courses instead of just making a course.

**Francis Brouns** At the OUNL we work in teams, were people from OTEC create the design and map that to IMS LD and faculty provides the content

**Karin Lundgren Cayrol** Very interesting, because we are now creating a collection of generic potentially valuable and reusable LD scenarios derived from existing distance education courses here at the Télé-université. Didactic scenarios according to what characteristics (pedagogical strategy, interactivity, type of evaluation etc.) We are actually discussing several possibilities to create a LD classification scheme

**Francis Brouns** At the moment we are creating a template for competence based education. I'll ask the project members if they are willing to share it. This refers back to several projects some years ago. Generally, all courses are competency-based. But faculties have their own interpretation. All projects created their own templates, and they turned out to be quite similar. I would have to check on the actual data.

**Karen Fill** The approach we are taking in the toolkit is to offer a "Save as IMS-LD" option after user friendly creation of a learning activity. Then there is complicated back-end programming to produce the XML

**Francis Brouns** Yes, to my opinion that is the way to go. However, it makes it more difficult to switch editors.

**Karen Fill** Possible scope for an interoperable conversion routine then?

**Francis Brouns** Well that depends a little on the technology used in your editor. Your internal format could also be XML.

**Francis Brouns** Yes, but a difficult one to realise, because you lose some semantics.

**Karen Fill** Yes. Chris Bailey & a pg researcher are working still on making this as transparent as possible. As part of their work they have written up what gets lost at the moment wrt IM-LD specs A,B,C. That paper should be in the Jan 2006 issue of JIME.

**Francis Brouns** The NNTP spec only specifies how the messages should look like. Not how to instantiate a NNTP server or a new discussion group. That is the problem Those parameters are very implementation specific.

**Colin Tattersall** Aha! Is there a learning service which is associated with a spec which gives the abstraction required? Chat? Mail? Search?

**Francis Brouns** Not to my knowledge

**Francis Brouns** To Karen: That would be nice to know. But we might not be talking about the same. E.g. we are developing an editor to create competence based education. There are several types of activities. In IMS LD all activities will be learning-activity. The editor will never be able to import existing LD, because it does not know what type of activity it should port to.

**Karen Fill** The toolkit allows all types of learning activity to be modelled. Could be a learning object, a unit, a programme ....just needs to have aims & learning outcomes & tasks

**Francis Brouns** Yes I understand that. But when you import IMS LD there is no notation to indicate what kind of activity in your editor it should be. So, it is a one-way, and not a round-trip. IMS LD specification needs to be changed to do this.

**Karen Fill** Ah, OK ... & that is not the only change ... :)

**Francis Brouns** Yes :). Problem is to find a generic enough notation that can be understood by all editor out there.

**Karin Lundgren Cayrol** When you mention 'what kind of activity', are you talking about pedagogical approach, strategy or other?

**Karen Fill** Yes - pedagogical approach is part of our specification - and we see an a learning activity as comprised of one or tasks that address specified learning outcomes.

**Francis Brouns** Not only activities. All you educational components you create in your editors. Most editors (except the RELOAD type) are for a certain pedagogical approach. When it comes to exporting it as IMS LD, you do not have a notation to e.g. specify this a study-task, this is an assessment, etc. (one or more tasks ..)

**Dawn Buzza** So, are we talking about a need for a controlled vocabulary now?

**Francis Brouns** Certainly when you want to develop editors that can import any kind of IMS LD.

**Karen Fill** Not a controlled vocabulary for creators of learning activities but an expanding mapping from what real teachers do to how IMS-LD (or others) represent that.

**Dawn Buzza** I thought the real teachers would be the creators of the learning activities...

**Karen Fill** Yes I mean that too

**Karen Fill** So wouldn't want to 'limit' their vocabulary

**Francis Brouns** For example. Collage creates cscl courses and can export this to IMS LD. However, Collage probably can not import any IMS LD (not cscl based) and knows how to map it to the various collage components

**Karin Lundgren Cayrol** A controlled vocabulary might be restraining for the practitioner but helpful to create the bridge between IMSLD and other approaches

**Davinia Hernández Leo** To Francis: That's right, additional information (with the collaborative learning flow structure) is needed.

**Karin Lundgren Cayrol** Thanks for the discussion, and we look forward to collaborate with Francis, Karen, Dawn and all others interested in building a repository of IMSLD templates and a common vocabulary Karin and Ileana

**Francis Brouns** Davinia, it was really nice to see that you could completely hide the intricacies of LD in Collage.

**Davinia Hernández Leo** Thank you, but Collage is only level A compliant, let's see how we manage with levels B and C... (It will be more difficult)

**Francis Brouns** Yes you are right, but the approach is nice. Authors should not have to know they are creating LD.

**Karin Lundgren Cayrol** We agree that authoring a LD should be transparent to course designer/user

**Maria Skiadelli** Where the UoL repository can be found in the Unfold site?

**Colin Tattersall** The repository is at <http://moodle.learningnetworks.org/mod/resource/view.php?id=217>. You'll need to register on the site

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## **Paper2: Manuel Caeiro-Rodríguez, Towards a Benchmark for the Evaluation of LD Expressiveness and Suitability**

**Colin Tattersall** Are you intending to compare different EMLs once you have developed the evaluation benchmark? If so, which ones

**Manuel Caeiro Rodriguez** No, currently I only plan to evaluate LD

**Colin Tattersall** To Manuel: is that due to time or is that outside the scope of your area?

**Manuel Caeiro Rodríguez** It would be possible to evaluate other EMLs (e.g. PALO, EML, ...) but I think currently LD have all the attention. In addition, I have some time restrictions and I need to focus the attention on the second part of the thesis Anyway, I think that the evaluation approach based on the development of a benchmark of conditions is valid

**Karin Lundgren Cayrol** Transition from one representation to another often results in a loss of expressiveness & suitability in some ways, but can also be mutually enhanced (Ileana et Karin)

**Manuel Caeiro Rodríguez** Yes, initially I think that this comparison could be performed without much effort. Perhaps, the main issue is they are similar, they are focused on the main perspectives.

**Colin Tattersall** I would be interested in an comparison of EML and LD since the transition from one to the other may well have affected expressiveness & suitability.

**Manuel Caeiro Rodríguez** In relation with expressiveness and suitability I think that a main point is where we situate the level of abstraction. For example, LD can be suitable to support UoLs execution at a level of properties, conditions and notifications. But this level is not suitable to support the reuse of UoL at the level of instructional designers

**Colin Tattersall** Various parts of EML were pruned in the move to LD (e.g. questions). In some ways, life is harder now since we have to deal with several specs. But I'm not sure if this relates to suitability - perhaps that's what Manuel means with level of abstraction?

**Karin Lundgren Cayrol** The MISA method is also being adapted to respect the IMSLD specification, but at the same time ensure as much as possible pedagogical quality control (I&K)

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### **Paper3: Alex Little, Developing an approach for Learning Design Players.**

**Dai Griffiths** For Alex Little: I was really interested by your presentation at Valkenburg. I had the impression that you were giving us the impression “this is really interesting, but it won't solve the player problem by itself”. Could you give us an idea of what the SLED project will be able to bequeath to the world in terms of providing a usable player, and what the limitations (if any) will be?

**Alex Little** I think the main thing it'll give us is a player with QTI integrated. The problem that we're coming up against now is how to integrate with ePortfolio - it's not being as straightforward as just using the same principle as we used for QTI. I think we've still a way to go in being able to integrate meaningfully with more than QTI

**Colin Tattersall** I have noticed in demos that it would have been useful to have more than one player available and so I'm happy to see SLED. And another player, a different presentation layer

**Colin Tattersall** I was wondering how hard it would be to integrate a SCORM player in SLED. Is it along the lines of integrating QTI? Any ideas?

**Alex Little** We've not really considered integrating a SCORM player -off the top of my head I think it would be different to integrating with QTI

**Alex Little** I think the principle we're using for integration (that we used for QTI) seems to work well for the QTI spec, but we're having trouble extending exactly the same principle to ePortfolio

**Colin Tattersall** Is that due to the nature of the ePortfolio spec (I think I heard Patrick mention this in Valkenburg)

**Alex Little** Yes - the way I've been trying to explain it is that the ePortfolio spec only defines the data structure of the portfolio store, and each one is specific for a particular



user, but for QTI the question remains the same - no matter who is looking at it, so the QTI question itself can be contained in the LD UoL - but it wouldn't mean anything to do this for ePortfolio

**Colin Tattersall** My gut feeling is that SCORM might be more along the lines of QTI; would be good to discuss in Glasgow

**Alex Little** I'll be explaining more about the problems that I see of integrating other services at the Glasgow meeting (it's what most of my presentation is about!!)

**Colin Tattersall** What was involved in dovetailing the forum service into the SLeD player? What kind of things would have to be done to use, say, Moodle's forums?

**Alex Little** Essentially just creating an interface to a web services based forum application and deciding on the options/methods/functions that should be available for moving to say a Moodle forum, the first thing that would need to be done would be make the Moodle forums accessible with web services (or other API) - at the moment the only interface is the GUI one. The other problem is how to 'map' or define what the functions/methods are if you want to switch between services - the specifics of the functions don't have to be identical (e.g., don't need exactly the same parameters) so long as there is some mapping that can be done.

**Colin Tattersall** OK. Let's say we find a web services based forum. Are things fairly straightforward?

**Alex Little** Yes, if you just have a single forum app you want to connect to then it's straightforward, it's when you want to allow people to switch forum providers as easily as possible where the problems start to come in

**Colin Tattersall** OK. And if there's some kind of spec already existing (e.g. NNTP for forums?) I guess this helps by providing a base set of functions

**Alex Little** Yes a spec like that would help. For other services which don't already have a 'hook' in the LD spec, e.g. QTI etc, the UoL author needs to put the 'commands' of what they would like the user to do in a resource file in the UoL (rather than actually being part of LD). It is how you decide what these commands should be (and how they should be specified) that we're starting to have to make best guesses - with QTI it worked well, because the 'commands' are just the QTI XML, but there isn't anything like this for (e.g.) ePortfolio, so we're having to create a way for authors to describe what they'd like the user to do

**Colin Tattersall** Is that the approach planned to be taken in the LAMS-LD mapping work.

**Alex Little** Yes, that's it. There's 2 aspects - one is the commands to just set up and define the parameters of the (e.g.) forum, the other is what the LD author actually wants the user to do at a particular point in the UoL

**Francis Brouns** Yes and in particular the 2nd aspect is very hard to express

**Alex Little** I'm not sure that it's technically hard to express - my feeling is the main problem will be in getting everyone to agree - especially if we want to use the same

methodology for describing LAMS services, Moodle services etc, so that LD UoLs can eventually be passed between different LMSs

**Manuel Caeiro Rodríguez** In my paper I consider an authorization perspective that is about such issues. What participants are allowed to do

**Alex Little** We've not really looked hard at getting the authorization done - the applications we're using so far are quite immature so security isn't a big issue (yet!!) - and we're really allowing any user to access all of the services - we're not specifying that one person can only use particular services

**Manuel Caeiro Rodríguez** To Alex: In my paper I am considering 2 perspectives (i) the operations available (e.g. read, write, delete a document); and (ii) the permissions that each participant has over such operations.

**Davinia Hernández Leo** How is going to be the SLED workshop in the UNFOLD meeting in Glasgow? Could you advance something?

**Alex Little** Yes, I'll be presenting some of the work we've been doing on Sled - more from a technical point of view, then Patrick & Diane are running a workshop, which will be more aimed at people wanting to use the player (so more for practitioners) (the one we're working on at the moment)

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#### **Paper4: Ileana de la Teja & Karin Lundgren-Cayrol, Transposing MISA Learning Scenarios into IMS Units of Learning**

**Colin Tattersall** Are there any plans for an LD import into MOT+?

**Karin Lundgren Cayrol** To Colin: No, we have no plans of uploading ims manifests into MOT+.

**Colin Tattersall** Thanks, that's an understandable position.

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#### **Paper5: for Dawn Buzza (plus co-authors), LearningMapR: A Prototype Tool for Creating IMS-LD Compliant Units of Learning**

**Sheila MacNeill** I was curious about the one of the outputs you described - the visual storyboard -can you explain a bit more? Is this like the LAMS interface?

**Dawn Buzza** We don't have this implemented yet in a computer environment, so at this point the storyboard is in Word format only.

**Sheila MacNeill** I was just wondering as I'm finding it hard to visualise and LAMS is my main LD ref for that kind of thing

**Dai Griffiths** Is the storyboard generated from the UoL, or is it a free text description of the UoL?

**Dawn Buzza** The storyboard is generated from the whole process of using the LearningMapR to develop a UoL, based on the input of the user/instructor.

**Sheila MacNeill** I guess the main thing with your work is getting teachers engaged with LD/instructional design concepts and starting to build lessons in that way

**Dawn Buzza** We're currently in discussion with two vendors of learning management systems regarding implementing LearningMapR in their systems.

**Sheila MacNeill** That sounds interesting with the vendors

**Dawn Buzza** It's coming along well with vendors - We have quite a bit of interest happening. We are offering free, non-exclusive rights to the model.

**Dawn Buzza** Not sure if this makes a difference, but the LearningMapR doesn't have to be LD compliant in order to function. The pedagogical patterns it points to will be LD compliant, and also in plain text or HTML.

**Sheila MacNeill** It would be interesting to see how it is integrated into an LMS - given the problems Alex et al have been facing.

**Dawn Buzza** Can someone tell us a bit more about the kinds of problems that have been faced?

**Sheila MacNeill** Well scalability is one thing for LD players in particular

**Karen Fill** I spoke with Les at Braga & offered to do some cases for your project. Are you interested in such offers from other institutions?

**Dawn Buzza** Les talked to Chris and he would have received our Call for Editorial Board Members. This invitation is definitely extended to you and your group - we hope you will get in touch about this.

**Karen Fill** I'll take this up with you outside of this session thanks.

**Karin Lundgren Cayrol** Maybe we should try to make exchange of course patterns?

**Francis Brouns** There were several 'templates' created, but they turned out to be very generic and not adhere to a particular scenario. And yes, I would be willing to exchange. However, I would have to ask the educational technologist for their examples

**Karin Lundgren Cayrol** So you are saying that they were not reusable, what do you mean by 'very generic'?

**Francis Brouns** The templates were re-usable. They just did not express a particular didactic scenario.

**Francis Brouns** That was mainly because people were still trying to learn how to express their design in LD.

**Dawn Buzza** We agree with you on this - lots of different groups seem to be working on pattern development. We extended a call for participation in an initial Editorial Board to collaborate on collecting and peer review of patterns.

**Karin Lundgren Cayrol** We will definitely get in touch with you.

**Dawn Buzza** We look forward to hearing from you!

**Dai Griffiths** I'm also interested, as I told Les. I'll be starting on a new Leonardo project soon which will be setting up a repository and LD templates for use in vocational education, so I have a very practical motive to be involved!

**Davinia Hernández Leo** I also work with patterns and IMS-LD (Collage editor) and I find the Editorial Board an interesting initiative. I already expressed my interest to Les and David

**Dawn Buzza** (From Kevin to Davinia Hernández Leo): We saw your work on the Collage project and thought it was great. We look forward to hearing more about it.

**Dawn Buzza** Glad there is interest among this group - we should have a great team if people around this table participate.

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**Paper6: Karen Fill: a learning design toolkit to create pedagogically effective learning activities**

**Antonio Fini** I tried to connect to the toolkit at <http://joker.ecs.soton.ac.uk/toolkit/> but it seems offline or wrong URL?

**Karen Fill** Yes - I've posted a correction in the discussion form for the paper

**Karen Fill** Please note that the correct URL for the toolkit is <http://www.nettle.soton.ac.uk/toolkit/Default.aspx>

**Karen Fill** The other URL should redirect but will not if the joker server is turned off. The joker server is Chris Bailey's own machine. He has gone from Valkenburg to a holiday destination so it is probably offline. Those who were at Valkenburg will have seen Chris's presentation of the paper that discusses the toolkit in relation to IMS LD

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**Colin Tattersall** I'd like to thank all participants for the lively discussion. Again, don't forget about the JIME forums associated with each article, and don't forget about next week's chat (October the 5th), which will focus on the Moodle&LD discussion article <http://jime.open.ac.uk/2005/02/>

## **October 5<sup>th</sup>: Discussion of Practical and Pedagogical Issues for Teacher Adoption of IMS Learning Design Standards in Moodle LMS**

The topic for this online discussion will be the article *Practical and Pedagogical Issues for Teacher Adoption of IMS Learning Design Standards in Moodle LMS* in the recent JIME special issue "Advances in Learning Design" <http://jime.open.ac.uk/2005/02/>. This was given an online event to itself, rather than included in the previous online discussion, because of the strong interest in IMS LD from the Moodle community, following extensive UNFOLD personnel involvement in activities on the moodle.org site, and the participation of leading members of the Moodle community in UNFOLD events.

### **1. Welcome**

**Colin Tattersall** Welcome everyone to this UNFOLD online chat on the article on Moodle and IMS Learning Design from the recent JIME special "Advances in Learning Design". We have some of the authors on the panel who are available to respond to questions you might have on the article. (Don't forget that JIME also has a forum facility for each paper and remarks can also be posted there.) Who would like to kick off with a question, remark, observation, ... (I have a question, but I'll wait to see if there's one from the floor)

**Dawn Buzza** Hi Colin et al, we are all here - Kevin, David, Les, Mark

### **2. Integration of Moodle and IMS LD and others**

**Anders Berggren** As authors we are very pleased that there's a lot of interest in Moodle/LD integration and that these things are advancing faster than we thought

**Colin Tattersall** Following on from Anders remark, Daniel, could you update us with news from the Moodle-LD Front?

**Dai Griffiths** Is there any news or updates on Moodle development road map which Martin Dougiamas was talking about in the UNFOLD meeting in Braga?

**Colin Tattersall** To Dai: the Moodle roadmap, which discusses LD integration, is here: <http://moodle.org/doc/?file=future.html>

**Daniel Burgos** To Colin. We are currently working on the exportation issue (this means taking a Moodle course and exporting it into a LD structure Level A) We expect to have something ready by the end of this year. Later we will start working on the importation feature

**Daniel Burgos** Anyway, first things first, and exportation looks like something more urgent in terms of interoperability, one of the main topics around Standards-Specifications

**Antonio Fini** any news about UOLs as a new type of course (par. 5.2 in the paper)?

**Anders Berggren** To Antonio: The closest is Moodle/LAMS type of UOLs where we now have access to a test server

**Antonio Fini** does it means creating a sequence in LAMS and insert it in Moodle as an activity?

**Daniel Burgos** To Antonio. The suggested new type of course is not so new, in fact. If we keep the basic skeleton of a Moodle course and export it, coming along to references to external services (like forums o wikis, for instance), that's all

**Colin Tattersall** Other work I know of in the area of Moodle LD integration is the work ongoing in the JISC SLeD project

**Anders Berggren** To Antonio: The test server is here: <http://elche.melcoe.mq.edu.au/moodle/>

**Anders Berggren** To Antonio. Yes, it is LAMS as a Moodle activity

**Antonio Fini** daniel. In this way the sequence would be simply the stack of topics or weeks we normally have in Moodle?

**Daniel Burgos** To Anders and Antonio. I think that the integration Moodle-LD will go also in this direction (when the importation is there), but inserting a UoL as a course, instead of a particular activity. Anyway, it's really soon to know what will be the final goal of this issue

**Anders Berggren** From what I know the SLeD project uses generic web services (in combination with translators) to run Moodle in the SLeD player. I don't know how far they have come.

**Antonio Fini** To Anders: can you provide us also an account for the test site :-)?

**Daniel Burgos** To Antonio. We are thinking of the structure, but the first approach looks at a Moodle course as one UoL with a single learning-structure (sequence-type), where every topic is a learning-structure

**Anders Berggren** To Antonio: No, but Ernie Ghiglione could do that.

**Daniel Burgos** Ops, sorry, I mean selection-type instead of sequenc-type ;-)

**Antonio Fini** Daniel: ok. I imagined it so too

**Anders Berggren** To Daniel: I think modules that can export is on the Moodle roadmap. To Dai: Sorry I don't know about the most recent thinking among developers.

**Daniel Burgos** To Anders. It will be fine when we can make it. Soon, I hope

**Dai Griffiths** Thanks. It looks like the main thrust of development is still as Martin described it, which is encouraging.

**Daniel Burgos** To Dai. We are working on it. The kick-off is done and it's an issue of time to have it ready following the suggested Moodle roadmad

**Anders Berggren** To all: Moodle 1.6 is due for Jan 2006 I think. Export/import of IMS/LD is intended for 1.7

**Dai Griffiths** On the link which Colin gave it seems that IMS-LD 1.7 has "Preliminary support for IMS LD Level A, allowing import and export"

**Dai Griffiths** No mention of LD in 1.6

**Anders Berggren** To Dai: No 1.6 is about LAMS integration. They are currently rebuilding LAMS and I don't know to what extent it will be LD compliant.

**Daniel Burgos** To Anders and Dai. Exportation is expected in 1.7 and importation in 2.0

**Davinia** And when will be realised Moodle 1.7? Any idea?

**Anders Berggren** To Davinia: No

**Daniel Burgos** To Davinia. As far as I know there is no expected deadline to deliver 1.7. The problem is that Moodle is working in several integration projects right now at the same time and they are out of time. Anyway, I expect it soon and by Christmas, for sure

**Daniel Burgos** I meant Christmas 2006

**Anders Berggren** To Daniel. I'll put it on my wish list ;-)

**Davinia** To Anders and Daniel: Thanks!

### 3. Development

**Dai Griffiths** I thought that Martin's discussion in Braga was really exciting. He was talking about configurable roles, conditional activities, and how all this fits with LD. Is there enthusiasm for this kind of development in the Moodle community? Most of what I hear about is the need to avoid lock in to a single course format, which is an important aspect but more seductive for institutions than end users.

**Daniel Burgos** It's just a personal remark, ok?

**Colin Tattersall** To Dai: do you mean most of what you hear in general, or most of what you hear today?

**Antonio Fini** to dai: there are features, as configurable roles, that are very important for example for collaborative learning and they would be very appreciated if implemented in moodle soon!

**Anders Berggren** To Dai: There's some interest in full LD compliance, but like someone said: it will probably take some time before people recognise what this is all about.

**Davinia** To Daniel: Yes, I understand this kind of time uncertainty...

**Antonio Fini** I mean that some features would be important not only for LD but in general. So I think (hope) that they will be implemented soon

**Dai Griffiths** Yes, sure, personal. I mean that when I've talked to people about the need for interoperability, in general, people talk about avoiding lock in. But my feeling

is that LD has the potential to go hand in hand with lots of cool developments that are underway in Moodle too. That's what I took away from Martin's presentation. I was just putting out a feeler in this discussion to see if that's how other people feel.

**Colin Tattersall** Yes, I agree Dai, and that seems like a fine statement to round off this discussion

#### 4. Terminology comparing Moodle and IMS LD

**Tunde** Hello - I am interested in the terminology comparison bit (section 3.1) between IMS LD and Moodle. Is there any work that may have been done on comparing the terms that the involved teachers use?

**Colin Tattersall** Tanks Daniel. To Tunde: which terms do you mean?

**Anders Berggren** Not that I know of, but the LAMS/Moodle vocabulary differs a bit.

**Daniel Burgos** To Tunde. There is no real practice with actual teachers about this issue. The suggested terminology was an academic suggestion of the writing group. It would be nice to check it with this focused group, though

**Tunde** I mean eg UoL / Course, etc. sorry just to explain my questions. We are working on an article on LAMS/learning design based on a LAMS review in schools, looking at practitioners' reception of a learning design tool and the terms they use in their practice and how it maps onto LD...

**Colin Tattersall** To Tunde; the terminology point is interesting, in that LD has a set of abstract terms given its ambition to cover varyig types of pedagogy. educational etting etc

**Colin Tattersall** To Tunde: particular tools or settings are quite likely to use different terms

#### 5. Interoperability and repositories

**Colin Tattersall** I have a interoperability question: do Moodlers ever need to export courses to other systems and if so, which ones and why?

**Colin Tattersall** (Maybe Moodlers only ever import :)

**Anders Berggren** To Colin: There are moodlers, not everyone, who want to share (as of yet). As of now we need to make zipped backups of courses that we can make availble in something like a repository.

**Daniel Burgos** To Colin. Usually Moodlers don't export-import to/from any other system, but my question to all is if this is because you can only do it with SCORM packages and there is no other facility developed or it's just because it's not completely needed for the Moodle-user. So, if Moodle would have the facility, would it be used?

**Colin Tattersall** To Anders: is the sharing of, let's say, pedagogical approaches, or more learning material?



**Anders Berggren** To Daniel: Some of us want to produce Moodle demo course. A real exchange system requires a LD standard though to be practicable.

**Antonio Fini** daniel. In my personal experience, no need. But here in Italy there is a growing community of moodle users, specially in universities, where this question was raised

**Anders Berggren** To Colin: That' difficult to say, I would want more or less complete concepts where I could use whatever I found useful. Everything in other words ;- )

**Antonio Fini** the opportunity of having a repository of courses, not only examples

**Daniel Burgos** To Anders. I don't get your point completely. What do you mean with "LD standard though to be practicable"

**Griff Richards** the time has come to enable linkages between learners and their knowledge constructions, not just repositories of stagnant content. Moodle + some elegant interoperability tools could pave the way.

**Anders Berggren** To Daniel: Moodle courses have their own format as of now. You can export them as LD or to another C/LMS.

**Daniel Burgos** To Antonio. Do you support the idea of a repositoy with full courses with actual content instead of guided examples or skeletons?

**Anders Berggren** To Daniel: can NOT - sorry

**Daniel Burgos** To Anders. But you have to create the module to make that exportation. Is that what you mean? If you had it you would use it

**Antonio Fini** In my personal idea, the real benefit is in examples, patterns etc

**Antonio Fini** but i heard colleagues talking about sharing real courses

**Antonio Fini** I agree with Griff. No need of more content repositories...

**Colin Tattersall** To Griff: Do you know of any Moodle users in the LORNET context?

## 6. Understanding IMS LD

**Colin Tattersall** Could the authors comment on whehether it was difficult to understand and position LD, and what might have helped to alleviate these problems? More explanatory material? More examples?

**Anders Berggren** To Colin: The authors would have needed more preknowledge. Hopefully we have some more now ;-)

**Kradovan** To Colin: At the moment I read the book of LD and I have some difficulties. And I would appreciate some course or something to better understand the idea of LD.

**Colin Tattersall** To Kradovan: we're trying to build up this kind of thing in the UNFOLD site ([www.unfold-project.net](http://www.unfold-project.net)), including short courses at [moodle.learningnetworks.org](http://moodle.learningnetworks.org)

**Kradovan** I'll visit the site.

**Colin Tattersall** To Kradovan: as you can see, we are enthusiastic users of moodle, and use it for a variety of R&D and dissemination activities

**Kradovan** To Anders: Can you advise me where to find some additional information to gain some preknowledge about Ld

**Daniel Burgos** To Kradovan. [www.unfold-project.net](http://www.unfold-project.net) and [moodle.learningnetworks.org](http://moodle.learningnetworks.org) and [dspace.ou.nl](http://dspace.ou.nl). You have several levels of knowledge and scope. Good reading

**Anders Berggren** To Kradovan: A good startingpoint could be the Moodle LDBookStudy course: <http://moodle.org/course/view.php?id=44> Lots of stuff here...

**Kradovan** to Daniel:Thanks

## 7. Closing

**Colin Tattersall** I'd like to thank everyone for participating

**Anders Berggren** On behalf of the article authors I really want thank everyone for their time and attention.

**Dawn Buzza** Thanks all, we enjoyed the discussion.

**Colin Tattersall** I'd encourage everyone to keep checking in at the UNFOLD site to keep abreast of the latest developments

**Dai Griffiths** Thanks to the authors for moving all this forward!

**Kradovan** Thanks to all

**Colin Tattersall** We'll be face-to-facing in Glasgow and Berlin in the coming weeks.

**Antonio Fini** thanks all and ...ad maiora with moodle and LD!!

**Daniel Burgos** Thank you Colin, Anders and all for your participation. It's always a pleasure. See you around UNFOLD and [moodle.learningnetworks.org](http://moodle.learningnetworks.org)

**Colin Tattersall** Thanks everyone

## ***December 15<sup>th</sup>: Jean-Philippe Pernin and Anne Lejeune: Invited paper 'Models for the re-use of scenarios of training' and online discussion***

### **Discussion paper**

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**Summary:** The aim of this paper is to contribute to increased reuse of pedagogical scenarios by teachers and trainers. We focus on the educational modelling languages framework, and propose a life cycle model for learning scenarios and describe the different aspects of a learning scenario through a second model. We also look at the functions that could be made available to users within new computer based environments.

**Keywords:** learning scenario, educational modelling language, IMS LD, computer based learning , artifacts, sharing, communities of practice.

### **Models for the re-use of scenarios of training**

#### **INTRODUCTION**

Problems of learning design carried out by the teacher currently occupy a strategic place in the field of ICT in education. Having looked at the creation, sharing and reuse of resources, (Parquette 2002, 2004, Pernin 2003, Crozat 2002) emphasis in the field of pedagogical engineering is now on learner activity as opposed to learning scenarios. The main focus is on reuse and sharing between educational professionals in terms of resources and pedagogical know how in a learning context.

The recent emergence of educational modelling languages go some way to answering these needs by proposing a formalisation of relations between actors, activities, resources, tools and services. IMS LD<sup>17</sup> appears to act as a way of standardising such languages. New artefacts aimed at implementing this specification are beginning to appear and will eventually give rise to new teaching and learning design practices. The success of these artefacts depends not only on their ergonomic quality but also on the appropriateness of underlying concepts of users practice and representation.

Rabardel's theory of the "development instrument" is based on psycho-educational trends which focus on activity. An instrument is defined as a product of user interaction with a system. The instrument constitutes a psychological reality which is contextualised and social in nature. The design process is not just about providing systems to users. Instead, artefacts are suggestions that individuals can decide to build on if they choose. The design process should be organised around pre-existing practices and should provide a flexible

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<sup>17</sup> Referred to more simply as IMS LD in the rest of this article

system which can be adapted to their needs. Creativity should be a characteristic of the design process and not considered an attempt to rework a dysfunctional artefact. The organisation of the learning design process is more effective when it alternates design phases with implementation. This approach leads to one of the main principles in e-learning: to build something that fulfils the social needs of training in collaboration with users in a given context

The aim of this paper is to contribute to the development of a conceptual framework allowing for the evaluation of and a strong focus on eLearning artefacts intended to manage pedagogic scenarios. IMS LD seems to be an exhaustive information model as opposed to a methodology allowing for the progressive introduction of tools whilst catering for the needs of various learner types. Two things seem to be missing: An explanation of evaluation, use and the development process  
The breakdown of an LD into logical facets that can be mapped to usual practices.

In the first instance we will examine the sharing practice of designs. We underline two frequent deficiencies in relation to the aforementioned solutions. On the one hand there is a low degree of formalisation of designs which are often described in free text, This makes them difficult to appropriate. On the other hand there is the difficulty of modifying and reusing “ready to use” designs.

In the light of these observations, the second part of the article looks at recent efforts to formalise designs in terms of modelling languages, IMS LD in particular. In putting forward a generic language to describe learning situations, IMS LD gives a glimpse into the possibility of auto-management of designs. We compare IMS LD to a design taxonomy which we put forward in a previous paper. (Pernin&Lejeune2004).

The third part of the article presents a generic model of the life cycle of designs which can also be applied to traditional learning situations as well as eLearning. Having outlined four distinct phases: Design of the scenario, contextualisation of the Scenarios, use of the scenario and reuse of the scenario, we put forward a number of steps intended to enrich the different facets of the design.

In the fourth section we turn to look at the use of computer technologies in relation to the model we put forward. We focus in particular on automatisisation and/or assistance to the user for four different facets of the design eg: design, run, observation and regulation. Each of these possibilities relate to different approaches respective of the technological environment, human tutoring or reflexive approaches to learning.

To finish we outline the prospects for research to which our propositions give rise. We focus on the need to reuse strategies at the heart of communities of practice. This assertion will take account of the gradual integration of computer based artefacts to meet identified needs.

### **Practices of sharing resources and designs.**

For nearly ten years important research has been conducted to come up with descriptive models and ways of categorising digital learning objects. As pointed out in a previous article (Pernin&Lejeune, 2004b) two major approaches can be identified; the

documentalist approach promotes sharing and reuse of objects based on a teaching model of sourcing, referencing and aggregating resources. The second approach is activity based and puts forward the model of teacher as designer. This work has resulted in the development of proposals of standards concerning languages of data indexing (LOM), computerised implementation models (SCORM) and lastly pedagogical modelling languages (IMS LD) (Pernin 2003).

Parallel to this work, new internet tools have resulted in the emergence of new communities of practice. To illustrate this we can point to a group of communities in France in the field of secondary education which featured in an important census conducted by the ministry of education through the Educnet website (Educnet). It is interesting to compare the actual activity of these communities with hypotheses based on documentalist and activity-oriented approaches. Do the basic needs of practitioners push them to share resources and know how? Do they feel it is necessary to share typical scenarios and detailed descriptions of the playing out of pedagogical sequences? Is there a link between the academic subject and the kind of sharing that takes place e.g. knowledge resources, links, exercises, sequences etc.

The answer to these questions lies in an in-depth study that identifies the appropriate variables.

In this article empirical analysis of sites presented on Educnet raises the following points:

There are as many sharing practices as there are UoLs

There's a big gap between disciplines in sharing approaches that favour resources or activities.

a significant number of scenarios describe learning situations which don not use digital technologies

in the case of sharing scenarios, activity description sheets are often offered. These forms, often in various formats, provide information such as the name of the author, the target audience, the duration, the pedagogical aims, the necessary resources etc.

many shared designs correspond too closely to defined objectives with the result that they cannot easily be used in other contexts

At this point we point to two frequently occurring deficiencies in the solutions proposed. On the one hand the varied nature of the formalisation of scenarios is often limited to free textual descriptions or specific formats which make it difficult to use. On the other hand, the difficulties associated with modifying ready made scenarios makes their use in other situations difficult.

## **2. SOLUTIONS OFFERED BY PEDAGOGICAL MODELLING LANGUAGES**

### **2.1 –The contribution of EMLs**

Appearing at the beginning of the year 2000 under the umbrella of Instructional Design, pedagogical modelling languages were seen as being increasingly necessary to players in the field of open and distance learning. CEN ISS define an EML (Educational Modelling Language) as a “model of information and semantic aggregation describing the content and the procedures in a UoL according to a pedagogic perspective with the goal of assuring reusability and interoperability.” IMS LD version 1.0 (IMS LD 2003) fulfilled

this definition. IMS LD, which originated from EML (Koper 2001) provides a methodological framework for modelling Units of Learning (UoLs) and aims to work as a compromise between a neutrality allowing the implementation of various pedagogic approaches and power of expression allowing for the precise design of a learning situation.

## 2.2 Defining a unit of learning with IMS LD

IMS Learning Design is based on the following principle: in a learning process each person has a role (learner or teacher) and seeks to obtain results by carrying out learning activities and/or support within an environment. The major concept of a Learning Design<sup>18</sup>, the "Method", is an element which allows the coordination of activities of each role in the associated environment to achieve learning objectives according to prerequisites. It is the element by which the learning process is defined and to which all other concepts are directly or indirectly referenced. The learning process is modelled on the metaphor of a play: from a structural point of view, a method is made up of one or more *plays*; a play is composed of a sequence of one or more acts: an act consists of one or more associations of a role with an activity or an activity structure (association of which is made through an element named *role-share*)<sup>19</sup>. Acts follow one another sequentially although more complex sequences can be defined in an act. An LD is based on multiple-roles and multiple-users and in theory allows for a description of eLearning as well as traditional or blended modes of learning.

In order to enable the modelling of units of learning of increasing degrees of complexity, IMS LD offers three levels of design, namely A, B and C. At level B, IMS

LD introduces *properties* which, in combination with the expression of conditions, enable the personalisation of the run. At level C, the designer can use *notifications*, in particular to define adaptable scenarios (Koper, R., Olivier, B, 2004).

As (Koper, R., Olivier, B 2004) point out, this specification is too recent (February 2003) to accurately evaluate at present. It is necessary to await the development of authoring tools, content management systems and runtime environments so that the creation, sharing and the interpretation of LD runs become realities. If extensions or elaboration are offered in the future, only the establishment of true communities of practices with a strong degree of inter communication (European project UNFOLD), will enable the transition of IMS LD from being a "standard on paper" to a "standard of use". However, it should be noted that there are a number of systems currently in existence or in development that are capable of interpreting LD. (Edubox, Reload, tools for modelling and runtime tools within the framework of the Alfabet project, Open Source environment CopperCore...).

## 2.3 –Taxonomy of scenarios and IMS LD

In a preceding article (Pernin&Lejeune

<sup>18</sup> Learning Design will be referred to as LD from hereon in

<sup>19</sup> For more information on IMS LD refer to <http://www.imsglobal.org/learningdesign/> and for a French presentation refer to (Lejeune 2004)

2004a), we proposed a model of eLearning based more on process and activities than on content. This model is based on the central concept of the *learning scenario* which represents the description, carried out *a priori* or *a posteriori*, of the playing out of a learning situation or a unit of learning aimed at the acquisition of a precise body of knowledge through the specification of roles, and activities as well as knowledge handling resources tools, services and results associated with the implementation of the activities. This broad definition covers diverse circumstances: for example it could apply to a traditional or computerised learning situation or to a UoL lasting just a few seconds or a course spanning a number of years. In order to avoid any ambiguity, we have established a taxonomy taking account of the following criteria: aims, granularity, degree of constraint, degree of personalization, degree of formalization, degree of reification.

By comparing IMS LD to these criteria, we aim to remedy any possible deficiencies or inaccuracies.

Purpose of a learning scenario. A *prescriptive scenario* is established a priori by a designer with a view implementing the learning situation. A *descriptive scenario* describes the unfolding of a learning situation with particular reference to the activity traces of players and the work they produce.

\* An LD describes a learning situation of which a device (partially or totally ICT based) will take control of the run. The information model of elements modelled relates to a prescriptive type of scenario. Some characteristics of a descriptive scenario are also envisaged: properties enable the storage of results obtained by a learner during an activity run and, in the same way, can be used to record the actual duration of a run of one step of the scenario, choice of route (path) or other traces. This last mechanism supposes that the LD incorporates level B or C in its design.

Granularity of an LD. Depending on the granularity of the learning situation at hand, we can distinguish between several levels of scenario. The playing out of an activity scenario describes an elementary activity (read a text, do an exercise, carry out a simulation), an activity sequence scenario describes the organisation of an activity sequence and a pedagogical structure scenario describes the structure of high level units such as lessons, modules etc.

From a theoretical point of view, we can equally describe with IMS LD all of the above scenarios without a hypothesis explicitly founded on the level of granularity of a UoL. However, the smaller the level of granularity, the more the description demands pedagogical design skills on the part of the designer. And so, as (Santos, O., et al. 2004) points out, modelling a learning situation with IMS LD is not easy even if using predefined units of learning. More specifically, in order to describe an activity scenario in detail recourse to complex mechanisms such as properties, condition and notification is required.

Constraint of an LD A constrained scenario gives a precise description of activities to be carried out and leaves a small degree of initiative to the actors in the learning situation. An open or adaptable LD gives a broad description of activities to be carried out and gives players choices which they are unable to anticipate without reducing the quality of the desired learning objectives.

Whilst IMS LD is particularly well suited to modelling constrained LDs, the specification suggests that control of a run can be entrusted to a learner, to a member of staff or even to the computer. However, recent research (Santos O et al 2004) has focused on expanding the model to allow for the description of genuinely adaptable LDs.

Personalisation of an LD. A prescriptive scenario is generic if its run is identical from one session to another whilst an adaptive LD takes into account personal profiles and allows for a conditional run and several personalised LDs which differ at the level of the given interactions or the resources that are made available.

IMS LD suggests that personalisation of UoLs is conducted according to the preferences, profiles, prerequisite knowledge of the users or a users educational needs/ situational circumstances (IMS LD Information Model). In order for LD to realise this objective, it has recourse to level B properties and conditions.

Formalisation of an LD An informal LD is designed by teachers according to empirical rules for the purposes of their teaching. A formal LD uses a pedagogic modelling language in order to allow for sharing and reuse between communities of practice. An LD which can be interpreted automatically has to be formalised using a “calculable” pedagogical modelling language in order to provide partial or total automation.

The principle of formalisation is intrinsic to pedagogic modelling languages. The vocabulary and the structure defined by IMS LD are supposed to be accessible to humans (as opposed to computers). In the scope of our work (project Emergence 2003 -2004) we have often been confronted with difficulties of terminology relating to the different subject-oriented cultures (cognition, teaching, computer science, pedagogues)

With regards implementation the information model provided in the form of XML schemas guarantees automatic and consistent interpretation by computer systems.

Reification of an LD An abstract scenario describes the constituent parts of the learning situation in abstract terms without accounting for the conditions required for implementation whilst a contextualised scenario gives a precise description of the actual constituent parts associated with the abstract scenario in terms of allocation of roles to real people, planning and the availability of knowledge objects, services and tools.

The conceptual model of IMS LD uses distinct elements to represent abstract constituent parts on the one hand (roles, description of services, knowledge objects) and on the other hand concrete resources (people, services, documents and IMS LD content). Nevertheless, difficulty lies in the fact that constituent parts and resources are defined at the same level without any effective distinction between stages leading to the contextualization of an abstract scenario. On the other hand, nothing stands in the way of pre-designed LD using specific physical resources from being modified to call up other knowledge resources, services or tools.

## **2.4 Extending work carried out to date**

The analysis of IMS LD in the context of the taxonomy we have proposed highlights a number of inaccuracies. Whilst the conceptual model initially proposed by Rob Koper (EML) constitutes an important step forward in terms of articulating the relations between actors, activities and resources, the proposed modelling language is not always clear in relation to the intended situations and the associated process of implementation. We should also point out that the IMS LD spec has become progressively richer in terms of items allowing for the effective description of a large variety of learning situations, but



which are based on technical vocabulary (concepts, conditions, notifications, events) or which are broken down into discrete blocks (Levels A, B and C) which are not easily accessible to the public they were intended for. In effect, IMS LD appears to be more of an exhaustive information model than a methodological tool allowing for the progressive introduction of tools required by various users.

As a result, what follows is an attempt to elaborate on the work carried out in this sphere by defining a conceptual framework aiming to clarify the elaboration process, the evaluation of scenarios and the breakdown of a scenario into logical faces corresponding to representations used and understood by practitioners.

### **3. PROPOSITION OF A LIFECYCLE MODEL OF SCENARIOS**

#### **3.1 The four major stages of the lifecycle of an LD.**

As a point of departure it is necessary to distinguish between a number of phases: inception, use and evaluation. We define the life cycle of scenarios as being composed of four main steps:

##### **Initial conception**

This phase allows for a general definition of the structure of an abstract scenario without accounting for the conditions needed for implementation

##### **Contextualisation**

This phase allows for the determination of conditions of use of an abstract scenario in a specific context in terms of authors, planning, resources, tools and services.

##### **Use**

This phase corresponds to the use of contextualised scenarios by different users (learners, teachers, tutors etc.)

##### **Reuse**

This phase focuses on the evaluation of results obtained during the previous phase with a view to setting conditions for subsequent reuse in other contexts.

#### **Initial conception phase**

This first phase enables a priori definition in general terms of the organisation and playing out of a learning situation. This task can be entrusted to a teacher in the context of perfecting his or her own pedagogical sequences, or it could be carried out by a specialist for industrial based training. This stage requires skills in pedagogical engineering as well as knowledge of the acquisition process for the intended target audience

The end result of this phase is an abstract scenario which does not account for the conditions of implementation. Moreover, the distribution of roles to real people, the association of resources described in an abstract way to concrete resources takes place during the contextualisation phase. This type of scenario can be created from nothing or can be adapted from existing scenarios.

A prescriptive abstract scenario includes three complimentary sections:

The prescription section specifies the organisation of activities which need to be carried out by the people involved in the learning situation as well as the definition of the environment associated with setting up activities (knowledge resources, tools and services). The nature of the prescription is linked to the didactic expertise of the designer and sets out to describe the conditions for the acquisition of knowledge at stake in learning;

The Observation section provides the practical details relating to the capture and structuring of information such as intended learning activity or expected production. The structure allows monitoring of the activity tracks of a learner or a group of learners as well as the elaboration of more sophisticated descriptions such as profiles or learning episodes. Unstructured or structured configurations can serve as a basis for the control of a learning situation, or can also be developed with a view to future reuse.

The control section defines a course of action to carry out subsequent to diagnosis conducted from observed or memorised information. The course of action can be in the form of direct feedback during the learning situation (by sending a message, providing advice etc) or it could be an adaptation of the learning scenario, modifying the initial organisation of prescribed activities and the constituent parts of the environment.

### **The contextualisation phase**

This phase enables a teacher to define the conditions for the set up of an abstract scenario in a concrete learning situation. We distinguish between a number of types of contextualisation tasks:

Allocation of roles specifies the names of the people who will take on the roles defined within the abstract scenario; in this way we can associate the name of the teacher with the role of tutor and a list of learners to a work group;

the planning of activities allows you to determine the conditions in which each of the activities is played out (duration, start date, finish date etc.);

Mediatisation consists of the creation, reuse or adaptation of knowledge handling resources required for carrying out activities. These resources, digital or otherwise, could be ready made or created for the scenario in question

Instrumentation involves the creation, reuse or adaptation of tools and services needed to carry out activities. Tools and services can be pre-existent or not.

Localisation involves making reused or adapted resources, tools and concrete services available to the actors for the duration of the scenario. In the context of digital learning spaces, this task involves the provision of a URL with access rights.

The concrete expression of abstract constituent parts can lead to specifying certain elements in the initial abstract scenario. The final task involves the refinement of the scenario to ensure its coherence and completeness during use. In particular this task could lead to specifying the conditions of personalisation of learning in relation to the target audience of the learning scenario

A contextualised learning scenario can be considered as a concrete and refined form of an abstract scenario, ready to be implemented in a specific learning context.

### **The run phase**

The run phase involves the implementation of a contextualised scenario in a learning situation. Its different facets (organisation of prescriptive activities, control and observation rules) serve as the basis for the actual activity of the different actors in the learning situation.. As we suggested in our preliminary definitions, a scenario can be adaptable, that's to say it can be modified, personalised or dynamically completed by one or more actors. An adapted scenario is the result of modifications made to the initial contextualised scenario during the playing out of the learning situation. These modifications can stem from:

the designer's will to delegate decisions, the anticipation of which would undermine the pedagogical effectiveness.

The character of the public concerned or the learning conditions

Weaknesses or inaccuracies in the initial scenario

As for the descriptive scenario, it retrospectively describes the playing out of the learning situation including the activity traces of the actors, their work or their interactions.

### **The reuse phase**

The last phase in the life cycle of scenarios sets out to establish an assessment of activities carried out during the playing out of a learning scenario. There is a double objective: on the one hand the evaluation of the effectiveness of a scenario in terms of didactics and pedagogy, on the other hand propensity for reuse in a different context.

We can distinguish between three main tasks within this phase : analysis, contextualisation and cataloguing.

The analysis of the learning situation is based on the comparison of the contextualised scenario, the progressively adapted scenario and finally the actual playing out of the scenario. This comparison can lead to several types of conclusion depending on the case:

The initial scenario has been the object of negligible adaptations and corresponds to the actual playing out of the learning situation.

The initial scenario has been the object of important adaptations but corresponds to the actual playing out of the learning situation. In this case we should study the modifications made in order to determine the origins, which can be linked either to the poor quality of the initial scenario, or to the high specificity of the implementation. The response will lead to the decision to reuse the initial scenario or the modified scenario.

The initial or modified scenario does not correspond to the actual playing out of the learning situation, this can reflect a lack of clarity, accuracy or appropriateness of the suggested scenario which does not correspond to the objectives, to the constraints or to the ability of the learners and the tutors. In this case, we need to question the relevance of the initial scenario or to detect errors made during the phases of contextualisation or modification.

Individual or collective motivation can preside over the decision to reuse an initial scenario or a modified scenario. In the first instance, a practitioner or a team of practitioners wish to improve the effectiveness of a training system using tried and tested means. The low variability of contexts can mean a high degree of reuse and progressive improvement of scenarios used. The second case corresponds to the will to share resulting in the emergence of a CoP: a group of practitioners united by a common culture of teaching, the level of the learner concerned, the pedagogical approach used etc. the desire of sharing know how acquired by some of its members. According to this hypothesis, the important variety of contexts could result in a halt if the shared scenarios are not sufficiently supple to be adapted to the demands of each.

In both cases, questions arise concerning formalisation and decontextualisation: how is it possible to describe a scenario in a way that is both complete and homogenous enough so that it can be easily reused? Does information that is too specific to the use context need to be disposed of in order to ensure wide-spread sharing of a tried and tested scenario? Once these choices are put into place, the decontextualised scenario should be correctly catalogued and indexed to make it easily searchable, reusable and adapted.

### **3.6 Summary of the life cycle of scenario model.**

In the previous paragraphs we have described the design stages, contextualisation, use and reuse of learning scenarios. These phases successively change the structure of the learning scenario.

The abstract scenario, a result of the initial design phase, specifies the organisation in terms of three facets (prescription, observation and regulation). And on the other hand it describes the environment required for a successful run (resources, tools, services, expected results).

The contextualised scenario, stemming from the contextualisation phase, refines the organisation of activities and specifies the material modalities (role allocation to people, planning) and associates concrete and findable objects with abstractly defined entities (resources, tools, services results) in the abstract scenario.

The adapted scenario is the result of gradual modifications of the contextualised scenario dynamically carried out by different types of actor (tutor/facilitator as well as learners) during the actual playing out of the learning situation.

The descriptive scenario or actual run, describes the playing out of the learning situation in the same terms as ready made scenarios: sequence of activities actually carried out, resources, tools and actual services used. Add to this information the work carried out by actors as well as the tracks of their activities.

The classical (typical) scenario, one of the possible results of the reuse stage, is obtained from the analysis of the actual run and from the comparison with other pre-made or adapted scenarios. Decontextualisation enables the abstraction of information that is too specific and which could constitute an obstacle to their reuse in other contexts.

## **4. Technological Instrumentation of the suggested life cycle model**

In the last section we proposed a lifecycle of scenario model. The computerisation of this model consists of introducing automatic mechanisms or help modules for certain stages of the process. This entails developing new functions which can be integrated into existing families of environments (within digital training spaces for examples) or proposed by new types of software.

In order to categorise its functions, it is necessary to take into account the degree of integration of digital technologies in the practice of the actors concerned and to allow for uses which are compatible with the material constraints on an institutional or cultural basis. For example, some teacher practices catalogued on the Educnet site show a willingness to share learning scenarios which don't require the use of a computer even though this constitutes an important element in terms of exchange and communication between practitioners. The reasons for this limitation stem from economic reasons (the teachers are more likely to have access to computer equipment than the students are), but it could also be linked to the conviction, justified or otherwise, that digital technologies do not noticeably improve the effectiveness of learning in the target subject area. We must therefore study the difference between functions relating to the management of scenarios and those relating to automatised learning situations by computer technologies.

#### **4.1 Managing learning scenarios**

The objective here is to allow exchanges between practitioners by rationalising the design and the reuse of learning scenarios which have been formalised according to a common set of rules. Consequently this entails the provision of computer tools with the following functions:

##### Assistance function for the design of abstract scenarios:

Create an abstract scenario: definition of the environment, organisation of activities based on the three facets of: prescription, observation and regulation:  
Editing and modifying an abstract scenario.

It should be noted that if each of the three sections of prescription, observation and regulation can be predefined in the initial scenario, it could equally be delegated to one of the actors (tutor or learner) during the run phase. In the case of non-computerised training, it is rare to find explicit formalisation of observation and regulation, the know how of teachers being considered sufficient unto the task

##### Assistance function for the contextualisation of scenarios

The objective here is to be able to define an operational scenario in the context of a given learning situation from an abstract scenario. The principle functions are:

Refining the scenario to ensure its coherence and completeness during the run phase  
Refining role types in the abstract scenario for real people  
Planning of activities according to a specific timetable (length, start date and end date)  
Associating concrete objects to abstract resources for knowledge use, tools and services.  
Locating concrete resources in the environment or spaces designed to capture work carried out or activities completed;  
Decontextualise scenarios in order to render them suitable for cataloguing purposes.

In a computerised learning context, abstract resources should be associated with concrete digital resources. The catalogue of scenarios will then have to be made interoperable with the catalogue of resources through the agency of a repository.

#### Cataloguing and search functions for typical scenarios

This is a case of managing catalogues of typical scenarios described with the help of the same rules and the following functions:

Indexing an abstract scenario with a view to its cataloguing

Cataloguing a scenario in among typical scenarios

Looking for a scenario in a catalogue of typical scenarios

Importing a typical scenario from a catalogue to an editing tool intended for abstract scenarios.

Cataloguing presupposes the existence of a description language which is standardised to allow for the widest degree of exchange possible between practitioners.

#### **4.2 Total or partial automatisisation of computerised learning situations.**

In the context of computerised situations, some functions traditionally confined to humans (prescription, observation and regulation) can be automatically run or assisted by dedicated computer environments.

#### Automatic run function of different scenario facets

In this case all the rules defined by the scenario must provide actors with the following:

Automatically prescribe activities

Provision of appropriate environment to the actors concerned

Automatically ensure the observation and the regulation of activities according to the rules established in the scenario

This automatisisation supposes that the work environment of the user is equipped with a runtime engine which is capable of interpreting a standardised description of a scenario whilst integrating other preexisting identification functions, planning functions, availability of resources, tools and services. It's this type of automatisisation which we are working towards in the Emergence project by integrating a runtime engine within the Digital Training Environment

#### Assistance and observation functions and the control of scenarios

We have seen that in computerised cases, it is possible to envisage the dynamic adaptation of scenarios during the implementation phase. This approach can be linked to two types of context, in the first case it entails a reflective approach on the part of the learner and in the second, to allow the teacher to be able to better determine the follow up conditions and control of the learning situation. In particular, it should be possible for the learner or the tutor to:

Set the collection and structure rules of raw observed data (activity traces, work done etc)

Set the rules for capitalising on raw or structured data

Selection means of visualising the observed data

Establish diagnostic rules

Dynamically regulate the situation in a general or personalised way

Dynamically adapt the initial scenario in order to make it correspond to observed data and to the diagnostic used

## Conclusion

The article features a definition of a learning scenario management process as well as a structural model describing the different facets of a scenario.

These suggestions need to be used by teachers in order to give rise to new artefacts within the confines of a conceptual approach. There's no guarantee that the suggested solutions put forward for complete automatisisation will fulfil all expectations.

By putting rigorous observation practices in place, by studying the appropriateness of new tools with their institutional constraints, technology, culture etc. we can expect to find in the near future a truly effective integration of digital technologies in the practice of teachers and trainers.

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**Transcript**

**of**

**online**

**discussion**

**Online discussion with Jean-Philippe Pernin and Anne Lejeune, 15<sup>th</sup> December 2005****Transcript edited by Dai Griffiths.****The raw transcript is also available on this server****Introduction**

**Jean-Philippe Pernin** Hi all, first we want to apologize for the quality of our English. We'll try to answer quickly to your questions, but probably with errors or mistakes. Could you warn us if you don't understand our arguments?

**Dai Griffiths** The English of the paper is excellent!

**Anne Lejeune** Thanks to Chris (for the english) 😊

**Chris Kew** Before we begin I should add that the English is a translation of the paper and that it might not always be as faithful as it should be to the original. Our panel for today's chat consists of Jean-Philippe Pernin and Anne Lejeune of the Instiut National de Recherche Pedagogique (National Institute of Pedagogical Research) based in Grenoble, France, authors of the paper which forms the focus of this session; MODELS FOR The RE-USE OF LEARNING SCENARIOS. As outlined in the introduction, the paper aims to look at ways of encouraging reuse of pedagogical scenarios among teaching staff. Can I ask either Anne or Jean-Philippe to say a bit more about it. If there's any more you want to say

**Jean-Philippe Pernin** We are : - Jean-Philippe Pernin from the National Institute for Pedagogical Research (INRP in French) and CLIPS-IMAG Laboratory in Grenoble (Alps) and Anne Lejeune from CLIPS-IMAG Laboratory. We are lecturers in computer sciences. Our main research topics concerns : - Engineering of learning dynamic scenarios. - Models, languages and tools for teachers - Tracking learning activities . We are implied in several projects at European or national levels (Kaleidoscope NOE for example). We try to work closely with teachers to define our models and tools. We organize for example training sessions with teachers (primary, secondary, university) in order to define the best formalisms to define and manage learning situations. We had also developed graphical tools dedicated to design learning scenarios in the context of the classroom. The main goal of this paper (which has been written in beginning of 2004) was to define a conceptual framework to elaborate a theory about the concept of learning scenario. The paper

develops mainly two arguments :

1) - It is very difficult to talk about a "learning design" or a "learning scenario" without defining precisely a set of criteria that characterize it. We work closely with teachers about the utility of using scenarios. It seems that a very wide variety of different practices exists. So, we have defined a first list of criteria to distinguish the different types of scenarios: purpose, granularity, degree of constraint, degree of personalisation, degree of formalisation and degree of reification.

2) For us a learning scenario is a "living object" which is initially defined by a teacher or an engineer. It cannot "a priori" define entirely and completely a learning situation. It is always modified and refined by users (teachers, tutors, but also learners) during the learning experience. So, from the initial specification phase, the learning scenario must contain not only the organization of predicted activities, but also the conditions and rules allowing its future adaptation. We so define three facets in a scenario: Prescription, Observation and Regulation.

In order to illustrate the dynamicity of a scenario, we propose in the paper a lifecycle composed of four main phases: initial specification, contextualisation, runtime and evaluation. In addition, we consider models and computer solutions required to implement our conceptual approach. We think that different models, languages and tools must be provided at the different steps. The modelling language for the designer must be different from the language required to operationalize it in a computer system. For instance, we consider that IMS LD is rather dedicated to insure computation and interoperability than to allow expression of situations by teachers.

### **Prescriptive and descriptive scenarios**

**Dai Griffiths** In your paper you describe the difference between "prescriptive" and "descriptive" scenarios. This seems to be the main problem that you identify in point 2) Is that right?

**Anne Lejeune** Yes, but there is another dimension that descriptive doesn't suit: the dynamical changes during the session. "Descriptive scenario" means "scenario that has been played"

**Dai Griffiths** Yes, that's what I mean. You say that the information model for LD "relates to a prescriptive type of scenario" (with the implication that it can't address a descriptive scenario).

**Jean-Philippe Pernin** No, we rather think that IMS LD describes static scénarios. Our subject is not to judge IMS LD but to precise conceptual framework

**Dai Griffiths** We've had quite a few discussions around this issue at UNFOLD meetings, often sparked off by the desire on the part of some teachers to change the structure of a UoL "on the fly", as it is running.

**Daniel Burgos** When you say "static" do you mean related to the learning flow, to the structure, to the content...?

**Jean-Philippe Pernin** To the fact that all these features must be changed "on the fly"

**Dai Griffiths** I think that you are right that a UoL is "static" in the sense that the learning flow is defined before the run starts, and it's hard to change, for example in coppercore, once the run has been started.

### **The taxonomy**

**Jean-Philippe Pernin** If possible, can we discuss about the taxonomy ? ... and the different criteria

**Chris Kew** The taxonomy is broken down and described in the following terms:

- Purpose of a learning scenario
- Granularity of an LD
- Constraint of an LD
- Prescriptive, descriptive and running scenarios
- Personalisation of an LD
- Formalisation of an LD

Any questions or comments relating to the taxonomy from either participants or panel?

**James Uhomuibhi** To Jean-Phillipe: Four major stages have been outlined as an LD lifecycle. How does this cycle affect reuse of scenarios in engineering which encompasses a diverse activities?

**Daniel Burgos** The learning flow can be adapted in runtime, and sometimes also the content. The only thing that remains from the design time is the structure and, even then, you can decide in runtime what to show and when. So you can adapt from more to less, although you cannot do it the other way around

**Daniel Burgos** What I see is that you define "on the fly" as "editing on the fly" and not as "adaptations" of the learning scenario already defined

**Jean-Philippe Pernin** Yes

### **Personalised AND prescriptive?**

**Mr Penguin** Can an LD really be personalized and prescriptive? It sounds contradictory.

**Anne Lejeune** What do you mean by LD?

**Mr Penguin** [LD = Learning Design]

**Chris Kew** We should perhaps qualify LD as IMS LD spec and "ld" as more general design for learning. To avoid any potential confusion

**Jean-Philippe Pernin** Is it possible for us to define a "a priori" scenarios taking account of learner typical profiles.

**Colin Tattersall** I think that it is possible to prescribe how learning might be tuned to characteristics of learners, which is sometimes meant by personalisation

**Mr Penguin** Probably more customization than personalization, then..? Personalization often assumes user-driven adaptation

**Jean-Philippe Pernin** Yes, customization could be better.

**Colin Tattersall** You are correct that personalisation is open to various interpretations. Could you give me an example of user-driven adaptation?

**Mr Penguin** OK, "user sets font size of page"

**Jean-Philippe** It is possible for a student to manage himself its own scenario during

**Pernin** the time.

**Colin Tattersall** OK. I think it is possible to design those aspects of the scenario which a student can manage him or herself (eg user choice of when to finish, user choice on optional activities). Probably though, not everything can/should be designed up front.

### Granularity

**Dai Griffiths** Granularity: We've discussed "granularity" quite a lot in UNFOLD, and it looks familiar. I see your "course activity scenario" as being comparable with the DialogPlus "learning nuggets". It's also related to the work presented by Sue Bennett the last UNFOLD meeting on patterns, and to the discussion there (and elsewhere) of how to define chunks of learning activity which are useful to teachers. Identifying these chunks is not easy, because different pedagogic approaches (and different teachers) have different views of what is significant and how it should be divided up (informed by their pedagogy).

**Anne Lejeune** About granularity: we distinguish three levels (activity, sequence, course)

**Davinia Hernández** How do you define the difference between sequence and course?

**lejeuneA** The difference is essentially: time

### Constrained / Open

**Dai Griffiths** Constrained & Open: This distinction makes sense, and is useful to distinguish scenarios. I'm not sure about the practical implications for the use of LD.

**Jean-Philippe Pernin** It is always the same idea to allow dynamic redifintion of scenario

**Dai Griffiths** In the paper you say "recent research ... has focused on expanding the model to allow for the description of genuinely adaptable UoLs". This is an interesting line of research, but for practical purposes it may not be necessary. It depends if you think it is necessary to model all the adaptability, or just to allow genuine and open adaptability for teachers and learners. A UoL is a plan. It can be used to set up an application which will run that plan. CopperCore and other learning design players make certain assumptions about how the plan will be

carried out, which may limit the adaptability of the scenario. But there is no reason why the UoL cannot be used to set up a learning activity with any degree of adaptability which you care to specify in the application of your choice. The UoL simply sets up the starting point, which can then be changed by the application, using whatever internal representation it happens to use. When the teacher has finished using it, and has perhaps made changes to the learning flow, the new (and modified) structure could be exported to LD again. I can see that there still may be an issue with describing the degree of adaptability which the designer would like to permit in a UoL, if that is something that we want to do.

**Davinia  
Hernández**

I totally agree with you. Another possibility may be that some parts of a particular LD should be constrained and others may be open according to determined pedagogical ideas. The problem here is how that could be described in the LD...

**Anne  
Lejeune**

We agree too. In addition to solve the problem of easily expressing adaptation in the LD, another problem consists to modify a scenario during the runtime (regarding to indicators and rules)

### *Virtual laboratories*

**James  
Uhomobhi**

To Jean-Philippe Pernin : have you some ideas how this can be applied to virtual laboratory scenarios?

**Jean-  
Philippe  
Pernin**

To James : I dont have precise idea about that question

**James  
Uhomobhi**

It is something we are currently looking at and your present paper seems to provide a lead on issues concerning enhance interaction which I believe needs to be explored in depth?

### **Facets of a scenario**

**Jean-  
Philippe  
Pernin**

We consider that there are three facets in a scenario: Prescription, Observation and Regulation. What is your reaction ?

As Observation, we consider all indicators or events that may be useful to improve the efficiency of the learning process. As Regulation, we consider all decisions that may be taken during the learning situation, in order to refine or adapt it. The regulation may address roles, activities, environment (resources and services), and the organization of those elements (scheduling, structuration of activities, etc.). The regulation may be processed by automatic ways

or by human beings.

- Dai Griffiths** From an LD background I'm finding the "Observation" section of the abstract scenario difficult to understand. Is it the definition of the monitoring services which will be used in the UoL?
- Colin Tattersall** We have done some work on feeding back successful paths taken by learners to give a recommendation to other learners
- Jean-Philippe Pernin** When is this feedback is decided : during the situation or after analysis
- Colin Tattersall** I think you can do both. There are though two distinct UoLs, as it were. The first is fully designed, parts of the second emerge (the sequencing)
- Colin Tattersall** So you can start from a very unconstrained UoL (everything is optional) and gradually see a pattern emerge which is a reasonably effective sequence (i.e. highly constrained).
- But I am also in favour of the feedback loop to teachers, and you are correct I think, in that this can happen during the 'run' and after the run
- Jean-Philippe Pernin** It is uneasy to plan all the optional paths. How do you make that? how the sequence can emerge?
- Colin Tattersall** By data mining the steps taken by learners. I should say that this happens 'around' the UoL not 'in' the UoL (difficult to explain in chat!)
- Daniel Burgos** Certainly you cannot plan all the optional paths. But you can go from a UoL described very in detailed with several possible routes and allow access to some parts depending on the learning flow, the action of the teacher and on the feedback of the students
- Jean-Philippe Pernin** I think that it is not realistic. We prefer to give means to modify or recreate scenarios at runtime
- Daniel Burgos** To keep it simple, for instance, showing and hiding activities, structures and environments. Another example: providing access to editing the content and some features of the IMS LD described by the teacher before. Anyway, and editor-player all-in-one with a publishing process in-between would be great. My point that is not



an issue of YES or NOT. With the current facilities we can make some things without remaining static

**Colin  
Tattersall**

That is, it is possible to describe what happened in a run post-hoc using IMS LD. Of course this doesn't solve dynamic reconfiguration of a run .

**Jean-  
Philippe  
Pernin**

Yes, we want to address this question : dynamic reconfiguration of a run.

I think that we have problems with the concept of dynamicity. It would be useful to deepen that point.

**Dai  
Griffiths**

I see it like this, (repeating what I said before in different terms). The distinction between design time and run time runs very deep in LD, which is appropriate for many distance teaching universities. It seems to me that what Jean-Philippe Pernin (and many others) are asking for is that this distinction should be blurred or removed, so that teachers can respond to evolving circumstances during their teaching. This is important in some other contexts, especially mixed mode (blended). As I've suggested earlier, I think that LD's role here is to provide an interoperability spec for definition of plans, set up of scenarios. If we want to have the teacher revising the plan as she teaches, then those plans will have to be executed in a new and as yet undeveloped application which provides that flexibility. When the course has finished, this new application could also export an LD representation of the lesson / course which the teacher actually carried out.

**Karin  
Lundgren**

Very well put Dai!

**Jean-  
Philippe  
Pernin**

It's true that we are specially interested by blended situations.

**Jean-  
Philippe  
Pernin**

It is really difficult for us to interact with this kind of tool when you have to address conceptual questions. We don't want to criticize LD, but we want to address theoretical point of views. And adopt a common vocabulary.

### **Published version of the paper**

**Davinia  
Hernández**

I would like to know the reference of the original paper, if it has been already published. Is there any other reference of your work?

**Jean-Philippe Pernin** It has been partially published in CELDA 2004.

**Continuing the discussion**

**Dai Griffiths** Thanks very much for the paper which has been very interesting and stimulating.

**Jean-Philippe Pernin** Thanks all for your questions. Could we continue that discussion by other means ?

**Daniel Burgos** The node is already created at <http://moodle.learningnetworks.org/mod/forum/view.php?id=333>

**Dai Griffiths** Very interesting, and a lot more to be gained from more discussion

## 6.4 Publications

Printed copies of UNFOLD publications will be appended to the hard copy version of this deliverable. Readers of the electronic document are referred to the links provided in the table on page 10

### UNFOLD publications for journals and conferences, January to December 2005

1. *De Vries, F., Tattersall, C., & Koper, R. (in press). Pre-Discussion Paper Future developments of IMS Learning Design tooling. Educational Technology & Society 2006* [<http://hdl.handle.net/1820/553>]

#### Abstract

In February 2005, a meeting of the UNFOLD project took place in the Netherlands,. The meeting gathered together around 50 people from all over the world who are using the IMS Learning Design specification in their own educational practice, or in designing software tools that utilize the specification. The focus of this discussion paper elaborates on that of the meeting: in which direction should the IMS Learning Design tooling develop in the near future? Given the discussion triggered one can conclude that IMS LD is considered a complex but powerful concept. The perceived use, range of tooling and suitable educational context is seen as broad.

2. *Burgos, D., Hummel, H., Tattersall, C., Brouns, Francis., Kurvers, H., Koper, R. Influence of face-to-face meetings on virtual community activity: the case of Learning Network for Learning Design Web Based Communities 2006. Conference paper. Spain* [<http://hdl.handle.net/1820/472>]

#### Abstract

Virtual communities main feature is the interchange of ideas and points of view around a specific topic, frequently split into several sub-topics. This activity involves participation, both active and passive, and it feeds back the community, keeping it warm and dynamic. On the other hand, thematic face-to-face meetings build and feed existing links between their members and encourage discussions on the topic of the conference. Using the virtual community of Learning Network for Learning Design – LN4LD (OUNL, 2004) and the European project UNFOLD (UNFOLD, 2004) we monitored and analysed several data of actions taken by users, members of this learning network. Both, the virtual community LN4LD and the face-to-face meetings for UNFOLD, are fully focused on the dissemination and

adoption of the specification IMS Learning Design and keep a strong shared relationship chasing this common objective.

Between January and June 2005 UNFOLD organized three face-to-face meetings. After the measuring and interpretation of all the data collected along this period, we are able to demonstrate that there is a direct cause and effect relationship between the organization of face-to-face meetings and the increase of registered users and the related actions taken by them inside the virtual community. We hypothesize that virtual communities of nonstructured learning get more internal activity when supplemented with face-to-face

meetings. This means that the face-to-face relationships increase and make stronger virtual links and they encourage the activity in the learning network. Along this case study we also show that it was multiplied by six the amount of actions taken by users and by four the amount of registered users. This paper provides a full detailed report on all the process and about the reading of the results that support the initial hypothesis. Supplementary, and in order to focus the topic of research and our approach, we also describe the theoretical background underneath the case study and a specific summary of the current panorama on virtual communities about IMS LD.

3. **Burgos, D., Arnaud, M., Neuhauser, P., Koper, R.** *IMS Learning Design : la flexibilité pédagogique au service des besoins de la e-formation*. La Revue de l'EPI. France: L'association Enseignement Public et Informatique December 2005. [<http://hdl.handle.net/1e820/470>]

### Abstract

La spécification IMS-Learning Design (ingénierie pédagogique) fait appel à des concepts pédagogiques permettant de modéliser les unités d'apprentissage. IMS-LD prend en compte une grande variété de modèles pédagogiques c'est là sa flexibilité. Un plan de cours extrait d'une base de données générale ou spécifique (comme Merlot 2005) peut être modélisé avec IMS-LD, grâce à la description des différents rôles, activités, environnements, méthodes, propriétés, conditions et notifications. Il est utilisé pour transformer les plans de cours en unités d'apprentissage (UOL) décrites de manière formelle et pouvant être exécutées avec un éditeur IMS-LD basé sur un moteur tel que Coppercore (Vogten & Martens, 2005). Ces unités exécutables peuvent être conçues dès le début en utilisant un éditeur tel que CopperAuthor (Van der Vegt 2005) ou Reload (Bolton 2004)). Elles peuvent être modifiées à partir d'exemples existants stockés dans un répertoire (ex. LN4LD (2004) ou Dspace (OUNL 2002)). L'Université ouverte de Hollande (OUNL Open University of the Netherland) s'est donnée pour tâche de fournir des moteurs, des outils d'édition et la documentation complète de la spécification IMS LD avec des exemples d'applications. Depuis 2004, l'OUNL participe à l'effort de diffusion mené par le projet européen UNFOLD et impliquant de nombreuses universités.

4. **Burgos, D., Berbegal, N., Griffiths, D., Tattersall, C., Koper, R.** *IMS Learning Design desde dentro. Una especificación para crear escenarios de aprendizaje online (parte I)*. In Learning Review. Issue 9. October-November, 2005. Buenos Aires [<http://hdl.handle.net/1820/473>]

### Abstract

IMS Learning Design, IMS LD de ahora en adelante (IMS, 2003), es una especificación centrada en formación online o e-learning y que permite modelar programaciones curriculares o lecciones presenciales de forma que puedan ser seguidas online, construyendo lo que se denomina Unidades de Aprendizaje (Units of Learning, UoL). También permite crear itinerarios de aprendizaje online ex profeso. IMS LD puede representar una gran variedad de modelos pedagógicos y permite que el profesor o profesora adapte sus recursos y sus programaciones de aula a clases virtuales de una manera completamente flexible. Lejos de mostrar actividades únicamente de manera secuencial o utilizar únicamente repositorios de objetos de aprendizaje, IMS LD

proporciona diversas características para generar aprendizaje adaptativo, dinámico y personalizado (Burgos et al, 2005).

5. **Hernández-Leo D., Asensio-Pérez, J., Dimitriadis, Y.** *Computational Representation of Collaborative Learning Flow Patterns using IMS Learning Design* Journal of Educational Technology & Society 2005, Vol. 8, Issue 4 [[http://www.ifets.info/others/abstract.php?art\\_id=580](http://www.ifets.info/others/abstract.php?art_id=580)]

### **Abstract**

The identification and integration of reusable and customizable CSCL (Computer Supported Collaborative Learning) may benefit from the capture of best practices in collaborative learning structuring. The authors have proposed CLFPs (Collaborative Learning Flow Patterns) as a way of collecting these best practices. To facilitate the process of CLFPs by software systems, the paper proposes to specify these patterns using IMS Learning Design (IMS-LD). Thus, teachers without technical knowledge can particularize and integrate CSCL tools. Nevertheless, the support of IMS-LD for describing collaborative learning activities has some deficiencies: the collaborative tools that can be defined in these activities are limited. Thus, this paper proposes and discusses an extension to IMS-LD that enables to specify several characteristics of the use of tools that mediate collaboration. In order to obtain a Unit of Learning based on a CLFP, a three stage process is also proposed. A CLFP-based Unit of Learning example is used to illustrate the process and the need of the proposed extension.

6. **Westera, W., Brouns, F., Pannekeet, K., Janssen, J., & Manderveld, J**

*Achieving E-learning with IMS Learning Design - Workflow Implications at the Open University of the Netherlands.* Educational Technology & Society, 8 (3), 216-225. October 2005 [<http://hdl.handle.net/1820/443>]

### **Abstract**

This paper uses the Open University of the Netherlands as an instructive case for the introduction of elearning based on the IMS Learning Design specification (IMS LD). The IMS LD specification, as approved by the IMS Global Learning Consortium in 2003, enables the specification and encoding of learning scenarios that describe any design of a teaching-learning process, i.e. support events, exchanges of projects, interactions and communications between participants. In 2004, after several years of small-scale pilots, the Open University of the Netherlands launched IMS LD-based online learning in an operational setting (over 3000 students). Rather than technology, the paper describes the implications for the workflow. The paper explains the processes involved with both IMS LD-based course creation and course delivery. Preliminary findings establish severe inconveniences for developers in the process of course creation, due to immature IMS LD tooling. Tutors, however, comment positively on course delivery, in particular on the way IMS LD supports course logistics, i.e. the arrangement of course runs, the control of student groups, tracking the students' progress and the support to the exchange of messages and papers. Even though the applied IMS LD-models were deliberately kept simple with respect to interactions and methods, students for their part appreciated the online courses, in particular the functionalities typically enabled by IMS LD, like personalised flow, tailored feedback and portfolios. In sum, taking for granted the

immature tooling, the IMS LD specification seems to work in large-scale operational settings.

7. **Brouns, F., Koper, R., Manderveld, J., Van Bruggen, J., Sloep, P., Van Rosmalen, P., Tattersall, C. & Vogten, H.** *A first exploration of an inductive analysis approach for detecting learning design patterns.* Journal of Interactive Media in Education (Advances in Learning Design. Special Issue, eds. Colin Tattersall, Rob Koper), 2005/03 September 2005 [<http://hdl.handle.net/1820/437>]

#### **Abstract**

One way to develop effective online courses is the use of learning design patterns, since patterns capture successful solutions. Pedagogical patterns are commonly created by human cognitive processing in "writer's workshops". We explore two ideas; first whether IMS Learning Design is suitable for detecting patterns in existing courses and secondly whether the use of inductive analyses is a suitable approach. We expect patterns to occur in the method section of a learning design, because here the process of teaching and learning is defined. We provide some suggestions for inductive techniques that could be applied to existing learning designs in order to detect patterns and discuss how the patterns could be used to create new learning designs. None of the suggested approaches are validated yet, but are intended as input for the ongoing discussion on patterns.

8. **Burgos, D., Koper, R.** *Virtual communities, research groups and projects on IMS Learning Design. State of the art, key factors and forthcoming challenges.* E-Journal of Educational Research, Assessment and Evaluation, vol. 11, issue 2 October 2005 [<http://hdl.handle.net/1820/469>].

#### **Abstract**

We carry out a report showing the state of the art about virtual communities, research groups and projects focused on the e-learning specification IMS Learning Design or directly related with it. This specification is currently becoming the most flexible and supported de facto standard to model full learning processes, as a complement for any structure of educational contents. Later, deriving from the previous study, we show a reading and a further analysis of the current panorama, and describe the key factors that show the relevance and impact of IMS Learning Design and also the main forthcoming challenges.

9. **Tattersall, C. & Koper, R.** *Advances in Learning Design: Special Issue Editorial.* Journal of Interactive Media in Education October 2005 [<http://hdl.handle.net/1820/460>]

#### **Abstract**

A brief editorial article introducing the JIME Special Issue

10. **Burgos, D., Koper, R** *Practical pedagogical uses of IMS Learning Design's Level B SIGOSSEE conference 2005*. Conference paper. Netherlands October 2005 [<http://hdl.handle.net/1820/471>]

#### Abstract

One of the main concerns while making lesson plans in IMS Learning Design is how to model practical pedagogical actual scenarios in IMS Learning Design, and how IMS Learning Design can help to move real lesson plans, fully focused on pedagogical and didactical uses, to an open e-learning specification without getting lost in the process within technical issues. So, is it possible to make it? and how? This paper intends to put together the pedagogical requests of teachers and learning designers and the technical approach needed to come them true using the Level B of IMS Learning Design. Through different examples and specific uses we describe both, the pedagogical needs and the suggested coding and we link them to provide a joint together view that allows to point out a discussion formula where didactical end-users needs on teaching meet a pedagogically expressive specification able to come across.

11. **Griffiths, David; Blat, Josep**: *The Role Of Teachers In Editing And Authoring Units Of Learning Using IMS Learning Design*. International Journal on Advanced Technology for Learning, Special Session on "Designing Learning Activities: From Content-based to Context-based Learning Services", volume 2, issue 3, October 2005. [[http://www.unfold-project.net/general\\_resources\\_folder/teaching/griffiths\\_atl.pdf](http://www.unfold-project.net/general_resources_folder/teaching/griffiths_atl.pdf)]

#### Abstract

The UNFOLD project, funded by the European Commission, runs a Community of Practice for Teachers and Learning Providers which has examined the way in which teachers can work with the IMS Learning Design Specification. The results of this work is presented. Relevant aspects of the specification are discussed, in particular the design process as it is set out in the Best Practice Guide. Two main challenges are identified and the approaches taken to address them described: a) how to enable teachers to participate in the initial design stages, and b) Secondly ways of representing Learning Designs to teachers. The role of design primitives, patterns, taxonomies and templates is outlined, and interface issues for tool design are explored. A short description is provided of some key projects in the area, including ACETS, DialogPlus, 8LEM, MOT+ and LAMS.

12. **Koper, Rob, Burgos, Daniel**. *Developing advanced units of learning using IMS Learning Design level B*. International Journal on Advanced Technology for Learning, Special Session on "Designing Learning Activities: From Content-based to Context-based Learning Services", volume 2, issue 3, October 2005 [<http://hdl.handle.net/1820/333>]

#### Abstract

IMS Learning Design (LD) is an open specification, released in 2003, to support the interoperability of advanced pedagogical designs in e-learning courses and other 'units of learning'. The specification supports three levels: level A is the basic level, level B adds

'properties, global elements, monitor services and conditions' and level C adds 'notifications'. Current tools for LD support level A of the specification. Some new tools are exploring the incorporation of level B, but there is still a lot of unexplored territory in this area. Also the documentation that is available today explains in detail the technical differences between level A and B, but not functionally. This tutorial paper introduces the possibilities of using IMS Learning Design level B to develop digital courses that support: collaborative learning, adaptive learning and personalisation, conditional text, runtime tracking, new forms of assessment and the modelling of ePortfolio's.

13. **Berggren, Anders; Burgos, Daniel; Fontana, Josep M.; Hinkelman, Don; Hung, Vu; Hursh, Anthony; Tielemans, Ger.** *Practical and Pedagogical Issues for Teacher Adoption of IMS Learning Design Standards in Moodle LMS*. Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://hdl.handle.net/1820/388>]

### **Abstract**

Integrating the specifications and tools for IMS-Learning Design (IMS, 2003) into Moodle (Moodle, 2003), an open-source Learning Management System (LMS), is not just a technological question, but also relates to practical, pedagogical, and philosophical issues. This study documents the discussions and experiments of a team of teachers active in the Moodle community who are concerned with the development of international standards in future versions of Moodle. In the course (Moodle, 2005a) of studying the book, Learning Design (Koper and Tattersall, 2005), participants analysed the implications of integrating the LD specifications into Moodle and the operation of various LD tools (Coppercore, Reload) and related tools (LAMS) within the Moodle environment. These differences were then summarized into general implications for future versions of both Moodle and Learning Design. This study concludes that continued, open dialogue between teachers and developers of both LD and Moodle is necessary to achieve transparent integration.

14. **Koper, R & Tattersall.** *C Learning Design: A Handbook on Modelling and Delivering Networked Education and Training* (Preface, reproduced with permission from Springer) Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://hdl.handle.net/1820/268>]

### **Abstract**

E-learning is still in its infancy. This can be seen both 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 offered 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 who have the task to develop course materials, plan the learning processes, provide tutoring, and assess performance.



To overcome these deficiencies, the IMS Global Learning Consortium Inc. released the Learning Design Specification in 2003. With **Learning Design** it is possible to develop and present advanced, interoperable e-learning courses embracing educational role and game playing methods, problem-based learning, learning community approaches, adaptivity and peer coaching and assessment methods.

In this handbook Koper and Tattersall have put together contributions from members of the "Valkenburg Group", consisting of 33 experts deeply involved in e-learning and more specifically learning design. The result is a rich and lasting source of information for both e-learning course and tool developers, providing information about the specification itself, how to implement it in practice, what tools to use, and what pitfalls to avoid. The book not only reports first experiences, but also goes beyond the current state of the art by looking at future prospects and emerging applications.

15. *McAndrew, P., Nadolski, R., Little, A. Developing an Approach for Learning Design Players.* Journal of Interactive Media in Education, Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://hdl.handle.net/1820/448>]

### Abstract

The EduBox system as described in Tattersall, Vogten and Hermans (2005) was developed at the Open University of the Netherlands in order first to support the use of EML as a formal way to describe its courses, and then redeveloped to support later versions of EML that evolved into Learning Design. Edubox is located as a solution for the OUNL and this allows it to offer a viable platform for student use and to use particular implementations for aspects that are not fully determined in the Learning Design specification. Examples of these are the ways to use question and test and the format for content. Edubox is built around EML 1.1 which is very similar to Learning Design but not identical. This means that EduBox is not designed as the basis for players outside the OUNL. This paper looks at developments on players that can be used more widely. It focuses on the use of the CopperCore Learning Design Engine [1] as a basis for how a player can work and two related implementations that use that engine: the Copper Core LD player and the SLeD player [2]. In all cases the intention is to produce open source software for free reuse and to assist others working in the same area.

16. *De la Teja, I., Lundgren-Cayrol, K & Paquette, G. Transposing MISA Learning Scenarios into IMS Units of Learning* Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://jime.open.ac.uk/2005/13/>]

### Abstract

This paper reports an exploratory study investigating the transposition process of a course called the Black Box into a Unit of Learning (UoL), characterized by its collaborative and multi-actor distance learning scenario. It was graphically represented by using the MOT software used in the MISA Instructional Engineering Method. To transpose this scenario into an IMSLD UoL, the iterative nature of this study helped develop the MOT+LD editor and an IMSLD Graphical Representation Code (GRC) now embedded in the editor.

The study showed that the MISA method and Level A of the IMSLD Specification share several conceptual elements and representations that accentuate their complementarity in a coherent and clear manner. This finding is very encouraging to extend the analysis of

levels B and C of the specification and adapt the MISA method to ease the construction of fully interoperable IMSLD UoL.

17. **Greller, W.** *Managing IMS Learning Design* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://jime.open.ac.uk/2005/12/greller-2005-12.pdf>]

### **Abstract**

Taking IMS Learning Design (LD) beyond the domain of researchers and programmers, this short paper looks at some of the challenges of mainstreaming it within institutional strategies, processes, and cultures. The experiences of embedding EML at the Open University of the Netherlands will be taken as a reference framework for stimulating managerial attitudes, and thoughts. The paper also intends to provoke some discussion and reflection on cost benefit of Learning Design in a higher education environment.

18. **Berlanga, A., & García, F.** *IMS LD reusable elements for adaptive learning designs* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/11/berlanga-2005-11.pdf>]

### **Abstract**

This paper presents an approach to designing adaptive learning environments based on IMS LD, which separates its elements (i.e. objectives, prerequisites, method, learning activities, adaptive rules, personalization properties, etc.) in order to use them in different Learning Designs and enforce their reusability and exchangeability. Moreover, it briefly presents an authoring tool under development to define adaptive learning designs compliant with IMS LD.

**Navarro, L., Díaz, A. Such, M., Morón Martín, D. & Peco, P.** *Learning Units Design based in Grid Computing* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/10/navarro-2005-10.pdf>]

### **Abstract**

The development of cooperative, flexible and reusable learning environments is a need in modern education. The IMS Learning Design specification has played a very important role in modelling and describing complex learning sequences; these tools and applications are used for making this standard design and interpretation easier. On the other hand, grid computing is starting to be used in teaching learning processes to solve complex tasks that require computing power and storage capacity. In this article, some alternatives are given to combine grid computing with teaching learning processes based on IMS Learning Design. Some elements are proposed to be considered in designing a Grid Learning Object (GLOB) to achieve communication with the "IMS Learning Design Engine". We have applied this method in designing a learning unit about the diagnosis of diseases in animals through images.

19. **Giacomini Pacurar, E., Trigano, P. & Alupoie, S.** *A QTI editor integrated into the netUniversité web portal using IMS LD* Journal of Interactive Media on Education, Special

issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/09/giacomini-2005-09.pdf>]

### **Abstract**

This paper presents our research work concerning the development of a QTI player and QTI editor that are integrated in a web portal, called netUniversité, to support teachers in designing educational Web sites based on pedagogical scenarios represented in IMS LD. In the first part of this paper, we introduce the context of our research work. Then we present a general overview of the netUniversité web portal. Finally, web describes the development process of the QTI player and editor as well as the QTI player integration mechanism into the netUniversité navigator module.

20. *Giacomini Pacurar, E., Trigano, P. & Zamfirescu, C. An IMS LD Graphic Editor using the graphs representation for modifying the course structures* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/15/giacomini-2005-15.pdf>]

### **Abstract**

We developed a Web portal, named netUniversité, that enables the teachers to create their courses online then to visualize, manage and participate to them. In order to create and execute the courses content, we have implemented an IMS LD player and an IMS LD web course content editor. These modules are integrated in the netUniversité. Using this application the teacher can automatically generate educational Web site structures, adding the pedagogical contents in these structures. However, the main weakness of a web editor (like ours) is the lack of a global view of course structure. These aspects prompted us to create a graphical editor that offers to the teacher a perspective on the IMS LD document with the possibility to perform some basic editing operations (adding, moving, deleting) in order to complete the web editor. In this paper we describe our approach concerning this graphical editor that is included in the web editor to the netUniversité web portal.

21. *Calverley, G. Making the Institutional Business Case for Introducing Learning DesignTools* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/16/calverley-2005-16.pdf>]

### **Abstract**

This paper explores constraints around institutions, particularly in respect of the potential for effective uptake of LD tools within institutions. It seeks mechanisms that may reduce the balance of effort so creation of UOLs based on LD is more justifiable in institutional contexts. It attempts to illustrate how apparent similarity between what are substantially different contexts can mask potential LD benefits. This can affect adoption of LD either through LD-based tools or through vendor-reliance of an institution.

The role of teams of LD experts, not affiliated to mainstreaming work in an institution, is also examined. Particular attention is paid to how they are contributing to reducing institutional load in providing the type of support described. This may help increase eventual uptake of individual LD developments.

22. *Gráinne Conole, G. & Karen Fill, K. A learning design toolkit to create pedagogically effective learning activities* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/08/conole-2005-08.pdf>]

### Abstract

Despite the plethora of Information and Communication Technologies (ICT) tools and resources available, practitioners are still not making effective use of e-learning to enrich the student experience. This article describes a learning design toolkit which guides practitioners through the process of creating pedagogically informed learning activities which make effective use of appropriate tools and resources. This work is part of a digital libraries project in which teaching staff at two universities in the UK and two in the USA are collaborating to share e-learning resources in the subject domains of Physical, Environmental and Human Geography. Finding, or creating, suitable e-learning resources and embedding them in well designed learning activities can be both challenging and time consuming. Sharing and adapting effective designs and solutions is both a stimulant and a time saver. This article describes the background to the specification of a learning activities design toolkit to support teachers as they create or adapt e-learning activities. This uses a model of pedagogical approaches as a basis for developing effective learning design plans and illustrates its use. The authors share their definition of a learning activity and taxonomies for the constituent elements. Real examples are discussed to illustrate their approach.

23. *Knight, C., Gašević, D. & Richards, G. Ontologies to integrate learning design and learning content* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/07/knight-2005-07.pdf>]

### Abstract

The paper presents an ontology based approach to integrate learning designs and learning object content. The main goal is to increase the level of reusability of learning designs by enabling the use of a given learning design with different content. We first define a three-part conceptual model that introduces an intermediary level between learning design and learning objects called the learning object context. We then use ontologies to facilitate the representation of these concepts: LOCO is a new ontology for IMS-LD, ALOCoM is an existing ontology for learning objects, and LOCO-Cite is a new ontology for the contextual model. Building the LOCO ontology required correcting some inconsistencies in the present IMS LD Information Model. Finally, we illustrate the usefulness of the proposed approach on three use cases: finding a teaching method based on domain-related competencies, searching for learning designs based on domain-independent competencies, and creating user recommendations for both learning objects and learning designs.

24. *Milligan, C., Beauvoir, P., & Sharples, P. The Reload Learning Design Tools* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/06/milligan-2005-06.pdf>]

### Abstract

The Reload Learning Design Editor (LDE) is an Open Source, close-to-specification, tree-based Learning Design (LD) editor written in Java using the Eclipse platform. The editor tools are complemented by a LD Player, which provides a familiar and user-friendly interface to the CopperCore LD runtime engine. This paper will describe the history and design rationale underpinning the tools, show how they fit into the LD authoring tools framework devised by [Griffiths et al. \(2005\)](#) and consider their suitability to various user roles and design approaches. The paper will conclude by outlining future versions of the software and how these new developments should facilitate the creation and manipulation of Units of Learning by staff in all user roles.

25. *Harrer, A. Malzahn, N., Hoeksema, K. & Ulrich Hoppe, U. Learning Design Engines as Remote Control to Learning Support Environments* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/05/harrer-2005-05.pdf>]

### **Abstract**

Context:

Chapter 5 of the Learning Design book describes the operational model of a learning design engine based on the concept of finite automata with output alphabet. We rely on this event concept to include pre-existing learning tools in flexible and rich learning designs.

Contribution:

We sketch an approach for the integration of complex learning environments in learning designs. Interactive learning support environments, such as argumentation or modelling tools are pre-existent and have a high potential when integrated in learning designs.

We propose an approach that aims at a clear separation of the learning design engine, the specification of the learning flow (as LD documents) and learning environments. According to its current state, the engine controls the learning environment with events (such as "start a new phase"), defined as a vocabulary for a set of environments, that are mapped to the environments' existing functionality (such as "create new workspace"). Thus the engine remotely controls the learning tools while the tools can initiate state transitions in the engine on specific events in the tool.

26. *Caeiro-Rodríguez, M., Llamas-Nistal, Martín. & Anido-Rifón, L. Towards a Benchmark for the Evaluation of LD Expressiveness and Suitability* Journal of Interactive Media on Education, Special issue on “Learning Design”. September 2005 [<http://www-jime.open.ac.uk/2005/04/caeiro-2005-04.pdf>]

### **Abstract**

IMS Learning Design (LD) has been presented as the EML standard. We propose a methodology to achieve an evaluation benchmark for LD and EMLs based on the identification of perspectives and patterns. We consider a perspective as a feature of an EML with a specific purpose which can be analyzed independently. For each identified

perspective, we study the involved patterns. A pattern is an abstraction that is frequently repeated in a design domain, it can be considered as a typical solution to a common problem. Perspectives and patterns provide the criteria that will made up the evaluation benchmark. The evaluation benchmark is proposed to carry out two kinds of evaluation: expressiveness and suitability. The final purpose is to contribute to the development of LD in order to enhance the reusability and interoperability of units of learning.

27. *Brouns, F., Koper, R., Manderveld, J., Van Bruggen, J., Sloep, P., Van Rosmalen, P., Tattersall, C. & Vogten, H. A first exploration of an inductive analysis approach for detecting learning design patterns Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://www-jime.open.ac.uk/2005/03/brouns-2005-03.pdf>]*

### Abstract

One way to develop effective online courses is the use of learning design patterns, since patterns capture successful solutions. Pedagogical patterns are commonly created by human cognitive processing in "writer's workshops". We explore two ideas; first whether IMS Learning Design is suitable for detecting patterns in existing courses and secondly whether the use of inductive analyses is a suitable approach. We expect patterns to occur in the method section of a learning design, because here the process of teaching and learning is defined. We provide some suggestions for inductive techniques that could be applied to existing learning designs in order to detect patterns and discuss how the patterns could be used to create new learning designs. None of the suggested approaches are validated yet, but are intended as input for the ongoing discussion on patterns.

28. *Buzza, Dawn., Richards, L., Bean, D., Harrigan, Kevin. & Carey, T. LearningMapR: A Prototype Tool for Creating IMS-LD Compliant Units of Learning Journal of Interactive Media on Education, Special issue on "Learning Design". September 2005 [<http://www-jime.open.ac.uk/2005/17/buzza-2005-17.pdf>]*

### Abstract

This article demonstrates and discusses a model to help instructors select appropriate designs from learning design repositories for courses they are developing. We describe the LearningMapR: A prototype pedagogical design tool being developed as a first step toward an IMS-LD-compliant authoring system. This tool's output is a Unit of Learning [UOL] containing storyboards, placeholders for content, and IMS-LD compliant templates and exemplars that are chosen from an illustrative set developed for the project. Based on collaborative work with the University of Oxford and using tools such as Reload as the base, we intend to create a 'teacher-friendly' tool for instructors to create UOLs.

29. *Tattersall, C., Burgos, D., Vogten, H., Martens, H., Koper, R., How to use IMS Learning Design and SCORM 2004 together SCORM 2006 conference. Taiwan July 2005 [<http://hdl.handle.net/1820/429>]*

### Abstract

Standardisation plays an increasingly important role in e-learning, requiring designers to make choices as to the route to be followed during the development of e-learning courses. IMS Learning Design is an e-learning specification which allows e-learning designers to describe Units of Learning – delimited pieces of education or training, such as courses,

modules or lessons. SCORM 2004 is the latest version of Advanced Distributed Learning's reference model for e-learning, which describes a content model and run-time environment for Shareable Content Objects. IMS Learning Design and SCORM 2004 are often positioned as mutually exclusive alternatives. This article outlines the case for using the two together and examines approaches to achieving integration between Units of Learning and Shareable Content Objects.

30. **Burgos, Daniel, Berbegal, Nidia, Griffiths, Dai, Tattersall, Colin, Koper, Rob.** *Do we need specifications in e-learning? The IMS Learning Design approach.* BINARIA Magazine. Issue 5. 2005. European University of Madrid. Spain

31. **Burgos, Daniel, Berbegal, Nidia, Griffiths, Dai, Tattersall, Colin, Koper, Rob.** *IMS Learning Design: How specifications could change the current e-learning landscape.* e-Learning World. Issue 2. 2005. Moscow State University of Economics, Statistics and Informatics - MESI. Russia [<http://hdl.handle.net/1820/354>]

#### **Abstract**

Do we really need specifications in online teaching and online learning? Have a look to the current panorama. How many Learning Management systems are there in the market? How many Virtual Learning Environments? Easily, we can count up to twenty of each. How many of them are open source? Just a few, starting with the well known Moodle (Dougiamas, 2004 ), a web community system with facilities for collaborative e-learning and following with Edubox (OUNL and Perot Systems, 2004 ). And now, with how many can we interchange contents and learning structure? It's a very simple answer. Zero.

32. **Burgos, Daniel; Tattersall, Colin; Koper, Rob.** *¿Puede IMS Learning Design ser utilizada para modelar juegos educativos?.* Online Educa Madrid 2005. Conference paper. Spain [<http://hdl.handle.net/1820/329>]

#### **Abstract**

In this article this question will be address and solved analysing the current research on the topic, dissecting the different kinds of educational games and its key features and proposing ways to model them with IMS LD. First we will analyse the variety of Educational Games that are described in literature. Then we will categorize their major features (these are the requirements for LD). Afterwards, we will discuss the general structure of LD and will look which of the general game features can be modelled in LD and which not (or not directly but via a workaround)

33. **Griffiths, David; Blat, Josep; Elferink, Raymond; Zondergeld, Sara:** *Open Source and IMS Learning Design: Building the Infrastructure for eLearning.* *Proceedings of Open Source Systems 2005,* Genova, 11-15 July 2005. [<http://oss2005.case.unibz.it/Papers/OES/ES2.pdf>]

#### **Abstract**

The development of open, flexible eLearning specifications has significant implications for and interactions with the FOSS movement. A short overview of eLearning specifications is provided, focusing on the difference between SCORM and Learning

Design (LD). The significance of LD for FOSS is examined, and common values identified. The particular contribution made by FOSS to LD infrastructure is discussed, and the importance of reference applications described. An overview is given of the FOSS applications available, divided into design time and run time, with particular reference to LD editors and the CopperCore Learning Design engine.

34. **Hummel, Hans; Burgos, Daniel; Tattersall, Colin; Brouns, Francis; Kurvers, Hub; Koper, Rob.** *Encouraging contributions in Learning Networks using incentive mechanisms.* Submitted to the Journal of Computer Assisted Learning (JCAL) 2005 [<http://hdl.handle.net/1820/339>]

#### **Abstract**

We investigate incentive mechanisms to increase active participation in Learning Networks (LNs). The LN under study is LN4LD, an LN for the exchange of information about the IMS Learning Design specification. We examine how to encourage learners in LN4LD to contribute their knowledge, and whether incentive mechanisms can increase the level of active participation. We describe an incentive mechanism based on constructivist principles and Social Exchange Theory, and experimentation using the mechanism designed to increase the level of active participation. The incentive mechanism allows individual learners to gain personal access to additional information through the accumulation of points earned by making contributions. Repeated measurements according to a simple interrupted time series with removal design show that the level of participation was indeed increased by the introduction of the reward system. It can therefore be considered worthwhile to use incentive mechanisms in LNs.

35. **Hummel, Hans; Tattersall, Colin; Burgos, Daniel; Brouns, Francis; Kurvers, Hub; Koper, Rob.** *Critical facilities for active participation in learning networks.* Web based communities 2005 conference [<http://hdl.handle.net/1820/319>]

#### **Abstract**

This paper investigates critical conditions for active participation in on-line communities of practice. As a case study, we use three generations of platforms designed to promote learning in the area of Educational Modelling Languages. Following a description of early experience with a conventional web site and with a community site offering facilities for collaboration, we describe a pilot implementation of a Learning Network. Preliminary participation data (both passive and active) is reported, together with lessons learned while setting up the pilot. Early experiences reveal that clear policies, usability and reward systems are critical when facilitating a Learning Network. We reveal first (positive) findings with introducing such a reward mechanism in the network. Our 'lessons learned' are phrased in terms of recommendations which will be used to guide subsequent Learning Network implementations.

36. **Hummel, Hans; Tattersall, Colin; Burgos, Daniel; Brouns, Francis; Kurvers, Hub; Koper, Rob.** *Critical Facilities for Active Participation in Learning Networks,* submitted to the International Journal of Web-based Communities (IJWBC), vol. 2 (2005), issue 1 [<http://hdl.handle.net/1820/349>]



**Abstract**

This article investigates conditions for increasing active participation in on-line communities. As a case study, we use three generations of facilities designed to promote learning in the area of Educational Modelling Languages. Following a description of early experience with a conventional web site and with a community site offering facilities for collaboration, we describe a pilot implementation of a Learning Network. Preliminary participation data (both passive and active) is reported, together with lessons learned while setting up the pilot. Early experiences reveal that clear policies, usability and reward systems are of importance when facilitating a Learning Network. We reveal first (positive) findings with introducing such a reward mechanism in the network. Our 'lessons learned' are phrased in terms of recommendations which will be used to guide subsequent Learning Network implementations.

37. **Koper, R., Burgos, D.** *Developing advanced units of learning using IMS Learning Design level B*. International Journal on Advanced Technology for Learning, 2 (4), 252-259. [<http://hdl.handle.net/1820/333>]

**Abstract**

IMS Learning Design (LD) is an open specification, released in 2003, to support the interoperability of advanced pedagogical designs in e-learning courses and other 'units of learning'. The specification supports three levels: level A is the basic level, level B adds 'properties, global elements, monitor services and conditions' and level C adds 'notifications'. Current tools for LD support level A of the specification. Some new tools are exploring the incorporation of level B, but there is still a lot of unexplored territory in this area. Also the documentation that is available today explains in detail the technical differences between level A and B, but not functionally. This tutorial paper introduces the possibilities of using IMS Learning Design level B to develop digital courses that support: collaborative learning, adaptive learning and personalisation, conditional text, runtime tracking, new forms of assessment and the modelling of ePortfolio's.

38. **Hummel, H; Tattersall, C; Burgos, D; Brouns, F; Kurvers, H & Koper, R** . *Facilitating participation: From the EML web site to the Learning Network for Learning Design* IADIS Conference on Web-Based Communities (WBC2005) Carvoeiro, Portugal, February 2005 [<http://hdl.handle.net/1820/338>]

**Abstract**

This article investigates conditions for increasing active participation in on-line communities. As a case study, we use three generations of facilities designed to promote learning in the area of Educational Modelling Languages. Following a description of early experience with a conventional web site and with a community site offering facilities for collaboration, we describe a pilot implementation of a Learning Network. Preliminary participation data (both passive and active) is reported, together with lessons learned while setting up the pilot. Early experiences reveal that clear policies, usability and reward systems are of importance when facilitating a Learning Network. Our 'lessons learned' are phrased in terms of recommendations which will be used to guide subsequent Learning Network implementations.

39. *Van Es, R., Koper, R. Testing the pedagogical expressiveness of LD. Educational Technology & Society. February 2005* [<http://hdl.handle.net/1820/305>]

### Abstract

The IMS Learning Design specification (LD) was introduced as an answer to the shortcomings of existing learning technology specifications. The main difference with existing specifications is that LD is an abstract, conceptual model that is able to express various pedagogical approaches whereby content can be adapted to personal needs and assessments can be integrated. In this article we evaluate the pedagogical expressiveness of LD by taking a set of 16 lesson plans and expressing them in LD. We use three different methods to identify difficulties in expressing the lesson plans in LD. Difficulties identified included circulating a document within a group, giving instructions prior to the start of an activity, random assignment of a group member to a role, group formation at runtime, creation of an inventory to map pre-knowledge, learning objectives and learning achievements, and a way to communicate information on how to deliver a lesson to a teacher. We did not find situations that were impossible to express with LD. The difficulties found are elaborated and suggestions to handle them are given. The methods used are compared and suggestions are given for further research.

### Other publications

*O'Neill, O., Nadolski, R., Koper, R. Implementing E-learning Specifications with Conformance Testing: Profiling for IMS Learning Design. October 2005* [<http://hdl.handle.net/1820/444>]

### Abstract

Improving interoperability between e-learning systems and content has been one of the driving forces behind the adoption of e-learning specifications over recent years. A vital step towards achieving this goal is the widespread adoption of conformant implementations of e-learning specifications. A conformant implementation is one which fully complies with the conformance requirements of the specification. However, conformance testing is time consuming and expensive. The process of localising specifications to create so-called "Application Profiles" to meet individual community needs further complicates conformance testing efforts. To solve this problem, we developed the conformance testing approach presented in this article. This approach simplifies the development of Application Profiles, and the process of conformance testing against them. Using this approach, test suites can be generated to test software applications against both e-learning specifications and their derived Application Profiles. A case study based around the IMS Learning Design specification demonstrates this process.

*Hummel, H., Koper, R. & Tattersall, C. LO -> LA: From a Learning Object centric view towards a Learning Activity perspective* [<http://hdl.handle.net/1820/340>]

### Abstract

This article argues why we must focus on the learning in e-learning. We hold a plea to rethink the current learning object centric paradigm in e-learning technology towards a more learning activity centric perspective on e-learning. After examining current needs in educational practice and the state-of-art in learning technology, we discuss the extent to which available specifications and LMS cater for these needs. We conclude that learning

technology should be enhanced with a specification able to capture a larger and more innovative variety of new pedagogical approaches to learning. As a solution to this problem, we propose that the IMS Learning Design specification offers a more generic pedagogical framework to also enable more activity-based and collaborative learning designs for a large variety of approaches and domains.

**Vogten, H., Tattersall, C., Koper, R., Van Rosmalen, P., Brouns, F., Van Bruggen, J., Sloep, P., & Martens, H** *Designing a learning design engine as a collection of finite state machines* 2005 [<http://hdl.handle.net/1820/303>]

### **Abstract**

Specifications and standards for e-learning are becoming increasingly sophisticated and complex as they deal with the core of the learning process. Simple transformations are not adequate anymore to successfully implement these latest specifications and standards for e-learning. IMS Learning Design (LD) (IMS, 2003b) is a representative of such a new specification in the field of e-learning. Its declarative nature, expressiveness and scope increase the complexity for any implementation. This probably is the largest hurdle that stands in the way of successful general deployment of this type of specifications. This article describes how an engine for interpreting LD can be designed as a collection of finite state machines (FSMs). A finite state machine is a computational model where a system is described through a finite number of states and their transition functions that map the change from one state to another. In the case of LD each state can be seen as constructed from a set of properties which can either be declared explicitly in LD or implicitly by the engine. State transitions are implemented through a mechanism of events and event handlers, completing the finite state machine. By re-using certain type of properties across FSMs it is possible to create an automatic propagation mechanism taking care of group dynamics without the need for any additional efforts. With the FSMs in place, personalization, one of the key features of LD, becomes a simple task. By combining the principles presented in the article, it becomes clear that an elegant design becomes feasible. This is demonstrated in the first actual implementation called CopperCore (Martens, Vogten, Rosmalen, & Koper, 2004).