

EML and IMS Learning Design: from LO to LA

Colin Tattersall and Rob Koper
Educational Technology Expertise Centre,
The Open University of the Netherlands

Key question: How can digital resources be used to support learning, or rather, how can learning be supported by digital resources?

Introduction

In the context of the aims of the first LTSN session (to devise practical strategies for supporting staff in designing online courses), this commentary describes EML and IMS Learning Design, covering both their historical development, current use and importance to staff and educational developers.

The thrust of the commentary will be that the current learning object centric view of the e-learning world should evolve to a learning activity centric view. Here, centre stage is given to the performance of individual and group learning activities designed to attain learning objectives and, in the process, making use of learning objects.

What are EML and IMS Learning Design?

EML is a notational system developed by the Open University of the Netherlands (OUNL) in the late nineties and intended to describe a wide variety of instructional models (for example, Competency Based Learning, Problem Based Learning). Once described in EML, these models are able to be interpreted (or 'played') by an EML-aware software component (or 'player'), analogous to the way HTML is interpreted by a browser. A prototype EML player has been used at OUNL for the past couple of years and a production quality player is currently undergoing final field trials.

[Figure 1: A screenshot of the EduBox player](#)

EML has since formed the basis for IMS Learning Design 1.0, which was approved as an IMS Final Specification on February the 10th 2003. As a result, EML is no longer maintained or updated and OUNL's attention is now focused on IMS LD.

Although EML and LD share a common philosophy and aim, there are differences between the two. The following table sketches the key differences:

EML	IMS LD
Produced by OUNL and made available to the learning technology community;	A specification developed and promoted by IMS;
Contains a content model, indicating how learning objects should be structured (based on the DocBook DTD);	No content model. Use of XHTML recommended, although other content supported (eg RTF);
A single, all-embracing approach to	A framework, integrated with IMS

developing learning experiences;	Content Packaging and integrating IMS Meta Data, IMS Question & Test Interoperability, IMS Simple Sequencing and other IMS specifications;
----------------------------------	--

Why is IMS LD important to staff and educational developers?

The learning objects movement has grown over the past few years, and is becoming increasingly mainstream. Several specifications and a standard for learning objects exist, and there is much interest in meta-data and packaging.

However, there is a growing feeling of uneasiness, a feeling that the primacy of re-usable learning objects is leading to e-learning as page-turning, that the people-to-content model [1] leads to “static, fossilized, dead [content], low learner motivation & engagement, impersonal & isolating environments”.

IMS LD provides a counter to the trend towards designing for lone-learners reading from screens. Its guides staff and educational developers to start not with content, but with learning activities and the achievement of learning objectives. It recognises that learning can happen without learning objects, that learning is different from content consumption and that learning comes from being active. It recognises, too, that learning happens when learners cooperate to solve problems in social and work situations. In all this, it stresses that we must focus on the learning in e-learning, and it is this focus which makes it important for staff and educational developers.

What is IMS LD about?

At the heart of the IMS LD specification (see [2] for the full version) is a model which underlies many different behaviourist, cognitive, and (social) constructivist approaches to learning and instruction. The model revolves around describing ‘units of learning’—atomic or elemental units providing learning events for learners, satisfying one or more interrelated learning objective.

In a unit of learning, people act in different roles in the teaching-learning process. In these roles, they work toward certain outcomes by performing learning and/or support activities within an environment, consisting of learning objects and services to be used during the performance of the activities. The approach separates learning objects and services from the educational method used in the unit of learning.

To give an indication of the type of ‘learning experience’ made possible using IMS LD, consider the following example, taken from the IMS LD Best Practice and Implementation Guide (see [2]), an example of Problem-Based Learning:

- The coordinator for the course makes a problem description available to the group (by uploading a file to a website).
- Each of the students in the group reads the problem (on the website), as does the facilitator.
- (In a synchronous conferencing system which includes the facilitator) The students decide who is going to be the chairperson - the spokesperson for the

group, responsible for recording key group decisions, and the chosen representative is appointed as such by the facilitator.

- The group then communicate amongst themselves to clarify the problem, using each other and the facilitator to discuss and clarify terminology and any open issues, eventually arriving at their own succinct statement of the problem at hand.
- The chairperson states this problem description in a file uploaded to the website and the group continues by identifying possible solutions or explanations for the problem.
- These possible explanations are clustered into a small number to be explored further by the students.
- The explanations to be pursued are listed in a file uploaded to the website.
- The group then identifies the learning goals of the problem and individuals embark on the required research.
- Eventually, the group meet up (using a synchronous conferencing system) to discuss their findings, again assisted by the facilitator.
- The chairperson summarizes the findings in a file uploaded to the website.
- Subsequently, an Evaluator and the Facilitator discuss the performance of the group and the Evaluator provides an Evaluation of the group (in a file uploaded to the website).

Here we see multiple learners, acting in various roles, using various learning objects and services. This 'learning flow' is orchestrated using the learning design specification, and becomes itself a resource to be interpreted by an IMS LD-aware player, and is able to be shared and re-used with others.

Where does re-use fit into IMS LD?

Since IMS LD separates the approach to learning from the learning objects and services used, opportunities for re-use are raised:

- Individual learning designs can be applied across different domains, so that the skeleton for Problem Based Learning described above can be used to structure approaches to medical problems, political problems, physics problems, computer science problems and so on. Each time, different content is coupled to the same activities of the learning design;
- Learning objects can be used in different educational models. Information on how to dissect a frog might support biology students in a learning-by-doing situation or might provide the problem from which to depart for students of ethics in a problem-based learning oriented approach. Here, different activities are associated with the same content.

How can staff be supported in applying IMS LD?

It is only a matter of weeks since the IMS LD specification was approved, and no IMS LD player yet exists. As a result, an important part of the benefit of IMS LD cannot yet be reaped—it is not yet possible to author an XML file coupling activities to resources and services as described by the specification and have this interpreted in an IMS LD

aware software environment for learners. However, we are confident that this situation will soon change as Learning Management System vendors familiarise themselves with the opportunities afforded by the specification. We are also exploring ways in which the available EML players might be 'upgraded' to become IMS LD-aware.

Nonetheless we feel staff and educational developers can already benefit from the philosophy of IMS LD by focusing on learners' activities and objectives, and designing e-learning environments with this philosophy in mind.

The vision towards which we are working sees educational best practices available as re-usable learning designs, able to be downloaded and customised by staff and educational developers, coupled to (re-usable) learning objects and interpreted by IMS LD aware environments, giving learners the stimulating, active, challenging and exciting experiences they deserve.

References

[1] Stacey, Paul, "People to People, not just people to content", Presentation at the IMS Open Technical Forum, Vancouver, February 20th, 2003 (available at <http://www.imsglobal.org/otf/vancouver/presentations/active%20Content/paulStacey-People%20to%20People.pdf>. A version of the presentation is also available at <http://www.bctechnology.com/statics/pstacey-feb1403.html>);

[2] IMS Learning Design v 1.0 Final Specification, (available at <http://www.imsglobal.org/learningdesign/index.cfm>)

Contact:

Colin Tattersall,
Educational Technology Expertise Centre, Open University of the Netherlands,
Valkenburgerweg 177,
6419 AT Heerlen,
The Netherlands
colin.Tattersall@ou.nl