An Open E-Learning Specification for Multiple Learners and Flexible Pedagogies

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INTRODUCTION

Significant investments have been made by universities, colleges, distance learning providers, and corporate training departments in the area of e-learning. Moving from early use of static HTML pages providing course details, the use of the Internet as a delivery technology for education and training is now commonplace, with both distance and presential learning providers exploiting e-learning in their offerings. A standards-based IT infrastructure is in place in educational institutions around the world, simplifying the delivery of e-learning courses and opening the doors to mainstream, large-scale, Web-based education (Brusilovsky & Vassileva, 2003). Many different virtual learning environments (VLEs) exist (Everett, 2002), including significant contributions from the open source community (Dougiamas, 2004; Sakai, 2005). Above the underlying IT standards rest a significant number of e-learning standards, specifications, and reference models (IMSCP, 2003; Loidl Reisinger & Paramythis, 2003; Wisher & Fletcher, 2004), designed to improve the interoperability between systems and remove islands of e-learning.

These infrastructural changes have been mirrored by developments in the area of learning objects (Littlejohn, 2003; Wiley, 2002). The learning objects movement is based upon the idea that reusable units of content can be created, shared, and reused between different communities, and is viewed as a solution to the significant production costs associated with the development of high-quality learning resources—see Sloep (2004) for a discussion of this issue.

Critics of the learning objects movement have expressed their uneasiness with e-learning as page turning that leads to "static, fossilized, dead [content], low learner motivation and engagement, impersonal and isolating environments" (Stacey, 2003). This debate has brought pedagogy in the e-learning community to the fore. How should different groups of learners best be taught? What does existing educational theory have to teach e-learning, and how could the results of this work be brought into e-learning systems? How could new information and communication technology developments, particularly in the area of collaboration and cooperation, be brought into e-learning offerings? How could ongoing R&D in the area of pedagogy and e-learning be more easily brought together and compared?

This article describes the IMS learning design specification (IMSLD, 2003). IMSLD is an open specification, freely downloadable, maintained by an international consortium of universities, system vendors, and learning providers. The specification provides a counter to the trend toward designing for lone-learners reading from screens. Instead, it guides staff and educational developers to start not with content, but with learning activities and the achievement of learning objectives.

A SPECIFICATION FOR MULTI-LEARNER, MULTI-ROLE E-LEARNING

At the heart of the IMSLD specification is a model that underlies many different behaviorist, cognitive, and (social) constructivist approaches to learning and instruction: People act in different roles in a teach-

ing-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. Put succinctly, IMSLD allows instructional designers to say who should do what, when, and with which support facilities in order to reach learning objectives.

There are three main documents to an IMS specification: an information model, a best practice and implementation guide (BPIG), and an XML binding document. The documents are very detailed and intended primarily for software developers who create the tools and systems that implement IMSLD. However, the benefits of use of the specification should be able to be understood by technically aware learning and instructional designers to enable them to determine its suitability for their purposes. These benefits are:

- E-learning system lock-in is avoided since courses can be exported as IMSLD from one system into another. The need to move courses between systems occurs both when new systems are purchased and when a heterogeneous set of tools is used at the same time, a situation not uncommon in both single and multiple learning provider situations.
- Procurement choices are increased through increasing system interoperability, with commercial and open-source tooling being better able to be mixed-and-matched to satisfy e-learning requirements.
- The market for buying and selling courses is made more appealing, since publishers are no longer bound to publishing for particular delivery systems.
- Instructional and learning designers are liberated from the use of non-e-learning specific (e.g., HTML) or proprietary scripting languages to create learning processes. Using the concepts described in the specification, designers are able to talk in terms of pedagogy rather than technology, making pedagogical choices explicit and subject to review, inspection, and critique.
- New avenues for educational R&D are opened, with diverse approaches to learning and teaching being better able to be compared when they are both described and delivered in a formal language defined in an open, technical specification.

IMSLD provides a notational system to describe "Units of Learning" (UOLs), an abstract term used to refer to any delimited piece of education or training, such as a course, a module, a lesson, and so forth (Koper & Olivier, 2004; Koper & Tattersall, 2005). The notation is capable of describing a wide variety of instructional models, or learning designs, such as competency-based learning and problem-based learning.

The specification provides a framework of elements that can be used to describe, formally to support machine processing, the design of any teaching-learning process. The creation of a UOL involves the specification of the learning design and also the bundling of all associated resources, either as files contained in the unit or as Web references, including assessments, learning materials, and learning service configuration information.

To give an indication of the type of e-learning made possible using IMSLD, consider the following example, in which students cooperate to investigate their differing viewpoints on a proposed European Constitution:

1. Learners individually consider whether they are "for" or "against" a European Constitution;
2. The learners then indicate their standpoint and enter a few sentences motivating this decision;
3. This process is monitored and ended by the tutor;
4. All learners then see all responses (anonymous);
5. All learners then enter personal reflections on all responses (not made public);
6. The tutor receives all responses and personal reflections once they have been entered; and
7. The tutor gives feedback on the responses and reflections and finishes the learning activity on a per learner basis.

Here we see a learning process involving multiple learners and various roles, using learning objects and services. This pedagogical scenario can be used both to help individuals learn about arguments associated with the proposed Constitution, and also to develop debating skills that are not specific to the topic. Clearly, the skeleton of the approach can be used in many other learning contexts.