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IMPLEMENTING LEARNING DESIGN: THE LEARNING ACTIVITY MANAGEMENT SYSTEM (LAMS)

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Abstract

Learning Design has the potential to revolutionise e-learning by capturing the “process” of education, rather than simply content. By describing sequences of collaborative learning activities, Learning Design offers a new approach to re-use in e-learning. This paper describes the Learning Design approach, a detailed example, and its implementation in the Learning Activity Management System.

Keywords

Learning Design, Learning Activities, Pedagogical Frameworks, Standards, LAMS

Beyond Content

E-learning has a well developed approach to the creation and sequencing of content-based, single learner, self-paced learning objects. However, there is little understanding of how to create sequences of learning activities which involve groups of learners interacting within a structured set of collaborative environments, or how teachers can make these sequences easily re-usable.

Given that a key dimension of education (particularly K-12 schools and Higher Education) is learning which arises from interacting with teachers and peers (rather than simply interacting with content), the lack of a mature approach to sequencing of multi-learner activities is a significant blind spot in e-learning today. This is surprising given that “lesson planning” - the process of determining the sequence of activities to be followed by a teacher and students when studying a topic - is well understood in education, but is mainly absent from e-learning. However, there is a growing body of work addressing this topic, based on the concept of “Learning Design”. Learning Design provides a first glimpse at the ways of describing multi-learner activity sequences and the tools required to support these.

Introducing Learning Design

Learning Design has emerged as one of the most significant recent developments in e-learning. It was the focal topic of Professor Diana Laurillard’ September IMS (Kraan, 2002) and December 2002 ASCILITE Keynote addresses (Laurillard, 2002). It has been the subject of a major Australian University Teaching Committee project (Harper & Oliver, 2002) and conference (AUTC, 2002). It is a driving concept behind a growing number of UK initiatives (such as the CETIS Pedagogy Forum, CETIS, 2003a; the Department for Education and Skills “Towards a Unified E-learning Strategy: Consultation Document”, 2003; and the JISC X4L “RELOAD” project, CETIS, 2003b) and it is the subject of discussion and/or implementation in a growing number of countries, such as Canada (eg, Downes, 2003) and Spain (eg, Griffiths, 2003).

From a standards/specifications perspective, IMS Global Learning Consortium has recently released the IMS Learning Design specification (IMS, 2003), based on the work of the Open University of the

Netherlands (OUNL) on “Educational Modelling Language” (EML - Koper, 2001), a notational language to describe a “meta-model” of instructional design. The OUNL coordinates an international EML/IMS Learning Design implementation group known as the Valkenburg group (2003), and OUNL have recently stated their intention to no longer continue developing EML, but instead focus their energies of the new IMS Learning Design specification (Tattersall, 2003).

While definitions of Learning Design vary, the main elements tend to include greater focus on “context” dimensions of e-learning (rather than simply “content”), a more “activity” based view of e-learning (rather than “absorption”), and greater recognition of the role of “multi-learner” (rather than just single learner) environments. While Learning Design does not exclude single learner, self-paced modes of e-learning, it draws attention to a wider range of collaborative e-learning approaches in addition to single learner approaches. Much of the focus on Learning Design arises from a desire for re-use and adaptation at a level above simply re-using and adapting content objects.

This paper describes the implementation of a broad-reaching Learning Design system called the Learning Activity Management System or “LAMS”. LAMS includes environments for user administration, student run-time delivery of sequences, teacher run-time monitoring of student sequences and, most importantly, teacher authoring/adaptation of sequences (see Figure 1 below). LAMS is inspired by, and heavily based on, IMS Learning Design and EML. However, LAMS was not designed to be a reference implementation of either specification - it was primarily designed to illustrate examples such as the one described below. LAMS is expected to be IMS Learning Design conformant in the future as both LAMS and the specification evolve to address current IMS Learning Design implementation challenges.

Learning Activity Sequence Example

To illustrate the implementation of Learning Design, consider the following learning activity sequence example based on the question “What is Greatness (in a human being)?” This example was developed in conjunction with Dr Donna Gibbs of the School of Education, Macquarie University. While it can be used in many contexts in different ways, it was initially designed for history students around the ages 14-16 in a K-12 school context. It is designed for use with an approximate group size of around 20-30 students, potentially located in more than one physical location. The sequence is designed not only to help students learn about great people from history, but more importantly to help students articulate their own concept of greatness, and through a process of engaging with content and their peers, to “stretch” this concept. There are four major activities to the sequence (although there can be more than one “sub-activity” within each of these). The sequence lasts for four weeks, with one major activity per week as follows:

“What is Greatness?”

Week 1: Students enter the environment via URL (either directly or from a LMS course page) and are presented with an asynchronous discussion environment in which to discuss and debate the concept “What is Greatness (in a human being)?” Students are not given any other content or context to this question so as to encourage students to articulate their views, and to engage directly with their peers.

Week 2: At the end of week 1, students are given access to the second activity, which includes a range of content types about great people from history (narratives, speeches, biographies, etc). These are provided as content objects (eg, text documents, webpages, files, etc) and URL links to relevant internet websites. After reviewing the content, students then use a search engine (eg, Google) to find an example of a website about a person they consider to be great. Students then share this URL (and a comment about why they selected it) with the class, so that all students are able to view each other’s selected websites.

Week 3: At the end of week 2, students are randomly allocated to four small groups, and each group is given a live chat environment to debate some specific questions about greatness from the teacher (eg, “Is greatness innate?”; “Can greatness be learned?” etc). One of the students is assigned the role of “scribe”, and is given a special scribe interface where they can record the small group’s discussion of the specific questions. The scribe is able to send out their record in real-time, and for the other participants to agree with this record, or continue to debate the relevant questions and the scribe’s record. This process typically iterates several times until the group agrees with the scribe’s revised record. Once the record is agreed, it is sent to a whole class webpage, where all students can see the outcomes of each of the four

small groups. This allows all students to compare and contrast the outcomes across the four groups.

Week 4: In the final week of this sequence, students individually write up a report on the original question, based on their learning experience across the whole sequence. This report is submitted to the system, which then helps manage the workflow of marking and commenting for the teacher. The end of the sequence is reached when students receive their marks and comments from the teacher.

From “What is Greatness?” to “What is jazz?”

One of the powerful features of the learning activity approach is that the content of a sequence can be easily changed to suit a different discipline, while leaving the activity structure unchanged. For example, the above sequence could be adapted for a music course by changing the initial question to “What is jazz?”, then changing the content in week 2 to audio files of jazz music, followed in week 3 by small group debates on which jazz composition was best and why (rather than “Is greatness innate?” etc); and in week 4, the students could be asked to write their own jazz composition, record it as an audio file, and upload it to the teacher for commentary as their assessable task (rather than submit a text report). The point is that the learning activity sequence can provide a “pedagogical template” which may be useful in many contexts by changing the “content” to suit different discipline areas. The focus on easy re-use with LAMS means that these changes can be implemented and ready to run with a new student group in approximately 5 minutes (provided the jazz audio files have already been obtained).

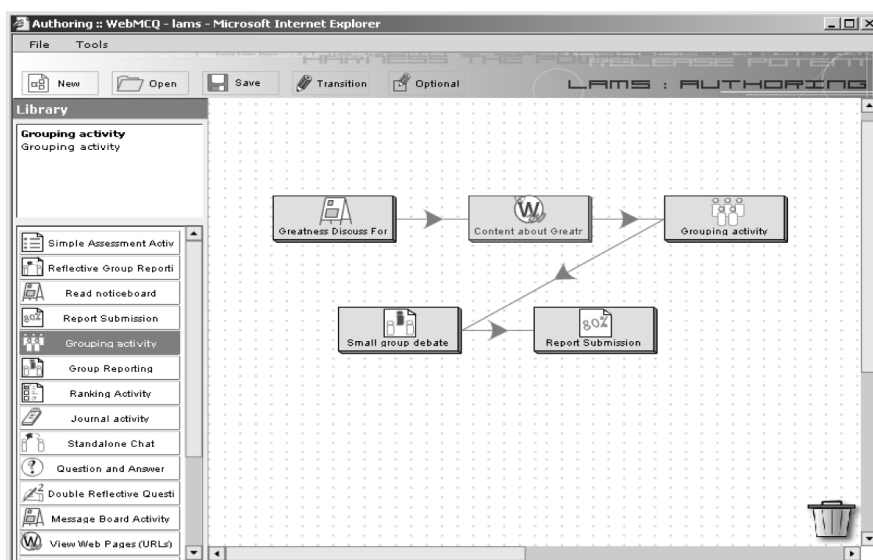


Figure 1: Screenshot of the LAMS authoring environment showing activity tools on the left, repository and sequence management tools across the top, and the “What is Greatness?” sequence in the middle.

Adapting the “What is Greatness?” template

Going further, the pedagogical template itself should be modifiable, so that if a teacher wishes to change the order of the tasks, or add/subtract activities from the template, this can be easily achieved. For example, a history teacher may want to use the “What is Greatness?” example, but due to the nature of her group of students, would like to begin with a short live chat session for the whole class prior to the week-long asynchronous discussion forum. In LAMS, this is possible within the authoring environment using a simple drag-and-drop system which helps make explicit the teaching and learning processes as a series of discrete activities. Adding a chat session involves dragging and dropping the chat tool to the start of the sequence, and then drawing a connecting line from it to the discussion forum to link it to the beginning of the sequence. A teacher may also choose to change the sequence by removing the assessment at the end, and instead replacing it with a number of optional “extensions” activities which may be completed in any particular order. This is achieved in the same way as the chat example, with the addition of an “optional” box to surround these activities. These changes to the original sequence would take approximately 5 minutes to implement and be ready to run with a new student group within LAMS.

Where to Next?

Current collaborative tools in LAMS include: question and answer (with student answers shared with the group either anonymously or identified), polling (with total responses shared with the group), asynchronous discussion forum, synchronous chat, noticeboard (simple text content/instructions), resource presentation and sharing (URL/webpages/files), notebook/journal, assessment submission, MCQ and True/False (with options to display feedback, average class score and “high” score), and various combinations of tools, including “chat and scribe” (see week 3 above). In addition, a grouping tool allows any tool to run in either whole class or small group modes. The flexibility of Learning Design indicates that many more collaborative tools can be developed to broaden the impact of the LAMS platform. Sequences created in LAMS can be shared among teachers either via email or the LAMS repository. LAMS is a fully functioning system currently undergoing beta trials with a range of K-12 school and university partners across Australia, Canada and the UK, with full release planned for early 2004 (please email the author for further details). Initial evaluations of LAMS in K-12 school and university environments during 2003 have indicated LAMS has a profound impact on both student learning and teachers’ conceptualisation of the learning process. Research into this impact is ongoing, but one striking early example is in student willingness to engage in whole class discussion of ideas. In one K-12 school pilot evaluation, only 15% of students were willing to discuss ideas in front of their peers in the classroom, but over 80% of the same students were willing to discuss their ideas within LAMS.

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