Discussion Paper for Learning Activities and Meta-data

James Dalziel
Director, Macquarie E-learning Centre of Excellence (MELCOE)
james@melcoe.mq.edu.au
15/7/03

Background

E-learning has a mature and 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.

A key dimension of education (particularly K-12 and HE) 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 small body of work addressing this topic, based on the new IMS Learning Design specification. Learning Design provides a first glimpse at the ways of describing multi-learner activity sequences and the tools required to support these. It can also encompass the existing mature concepts of self-paced single learner content.

This brief discussion paper arises from the potential need for additional meta-data required to describe learning activity sequences. While some aspects of DC or LOM will be relevant to a description of a learning activity sequence (title, author, etc), it is possible that some new descriptive meta-data fields may be required (some initial suggestions are provided at the end of this paper).

Learning Activity Sequence Example

For those unfamiliar with the concept of learning activity sequences, this section provides an example to help provide a context for discussion of additional descriptive meta-data. This example arises from a collaboration involving the author, Dr Donna Gibbs of the School of Education, Macquarie University, and the LAMS™ development team at WebMCQ Pty Ltd. Screenshots from LAMS are provided in the Appendix.

The example learning activity sequence is based on the question "What is Greatness (in a human being)?" It is 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 students, potentially located in more than one physical location. The sequence is designed to not only help students learn about some 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:

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 intentionally not given any other content or context to this question so as to encourage students to articulate their own views, and to directly engage with their peers' different views.

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 (such as text documents, webpages, IMS Content Packages, 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. The student then shares 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 placed into a live chat environment to debate some specific questions about greatness authoring by the teacher (eg, "Is greatness innate?"; "Can greatness be learned?"). 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 scribe's record. This process typically iterates several times until the group agrees on the 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 mark and comments from the teacher, and the teacher exports the marks into a spreadsheet or gradebook.

It is worth noting that one of the powerful features of the learning activity approach is that the content of a sequence can be 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; 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. The point is that the learning activity sequence can provide a "pedagogical template" that may be useful in many contexts by changing the learning content to suit different discipline areas.

Implications for descriptive meta-data

While some of the current fields of descriptive educational meta-data may be appropriate for learning activity sequences (title, author, etc), it is likely that this new approach will require additional fields. This paper is not designed to be an exhaustive list of these potential fields, but rather as a starting point for consideration of this issue. The initial suggestions are listed in italics below, together with some rationale for their inclusion.

Number of participants/Number of learners
The learning activity approach generally involves more than one person in the learning process – whether it is dialogue between a teacher and one or more students, or dialogue between several students or groups of students. There will be many possible structures for multi-learner collaborative activities which will be difficult to capture in a single descriptive field. However, some overall description of the typical the number of participants or number of learners may provide helpful information to those seeking to select appropriate educational materials for their courses. Vocabulary considerations could address whether ranges are permitted, or whether a single "typical" number is preferable. This field would also be relevant to existing learning objects where the number of participants/learners would be "one", to denote the single learner, self-paced nature of the object.

Period of time
Most (content) learning objects have an implied period of time, but this is generally no more than a few hours at most. However, learning activity sequences could run for days, weeks and even months, and hence some indication of the typical length of time associated with running the learning activity sequence would also be useful to those searching for educational materials of different "time scales". As above, vocabulary considerations could address whether ranges are permitted, or whether a single "typical" time period is preferable. This field would also be relevant to existing learning objects where the (usually shorter) typical period of time could be included.

Synchronous/Asynchronous/Both
Multi-learner activities can be conducted in synchronous and/or asynchronous environments. In an asynchronous environment (such as an asynchronous discussion forum), there is no assumption that some or all students are online at the same time in order to complete the designated task. In a synchronous environment (such as a live chat session) there is a requirement for real-time interaction between students. In any given learning activity sequence, there may be only asynchronous tasks, only synchronous tasks, or a mixture of both. Given that the role of a teacher/facilitator may vary according to this aspect of a sequence, it may be a useful descriptive field during a search for

educational materials. It is worth noting that synchronous sequences tend to have more demanding requirements on students (in terms of when they are online), teachers (in terms of when they are monitoring and/or intervening in activities), and software/hardware (as synchronous sessions tend to be far more intensive on systems).

References to (content) Learning Objects (or activities if in a Learning Object)
It is possible to build a learning activity sequence without any (content) learning objects embedded in the sequence. This may be due to the nature of the activities (which are discursive in nature and do not require learning objects) or because the sequence is a "template" sequence into which many different types of learning objects can be inserted depending on the discipline area of the sequence when used with students. In other cases, there may be one of more Learning Objects which are "referenced" from the activity sequence. This field could be used point to one or more recommended objects in a learning object repository. It would be possible to make this field interchangeable with (content) learning objects, so that objects could also point at recommended activity sequences. It may be that the future will see the evolution of dual, cross-referencing repositories of objects and sequences.

Other requested fields: Quality assurance and secondary usage
There are other types of fields which have been regularly requested in our experience of developing learning activities which could enhance both learning objects and learning activities. However, they pose challenges in how they would be implemented, so we note them here for consideration, but do not propose any final view of how these challenges could be resolved. The first is a field for some form of quality assurance. The vocabulary of this field would require careful consideration by communities of practice in terms of both its meaning and the process of designation – nonetheless, our experience is that "coalface" teachers regularly request this kind of information when trying to select educational materials. Similarly, the same teachers regularly request information about the prior usage of educational materials by their peers – "how often is a sequence used, by whom, is there any evaluation data arising from its use?" There appears to be the need for some way to aggregate or "point to" secondary usage meta-data from within both objects and sequences – although the methods of collating, analysing and representing this data will require careful consideration.

Conclusion

The new "learning activities" approach suggests that additional meta-data fields may be required for the descriptive meta-data about these sequences. This paper has proposed a number of potential fields as a starting point for discussion, and their potential relationship to (content) learning objects. Given the importance of collaborative learning for many educational environments, it appears likely that the learning activity approach will be influential over the coming years, so it is appropriate to consider new ways of describing educational material arising from multi-learner, collaborative sequences of activities.

Appendix – LAMS™ Screenshots

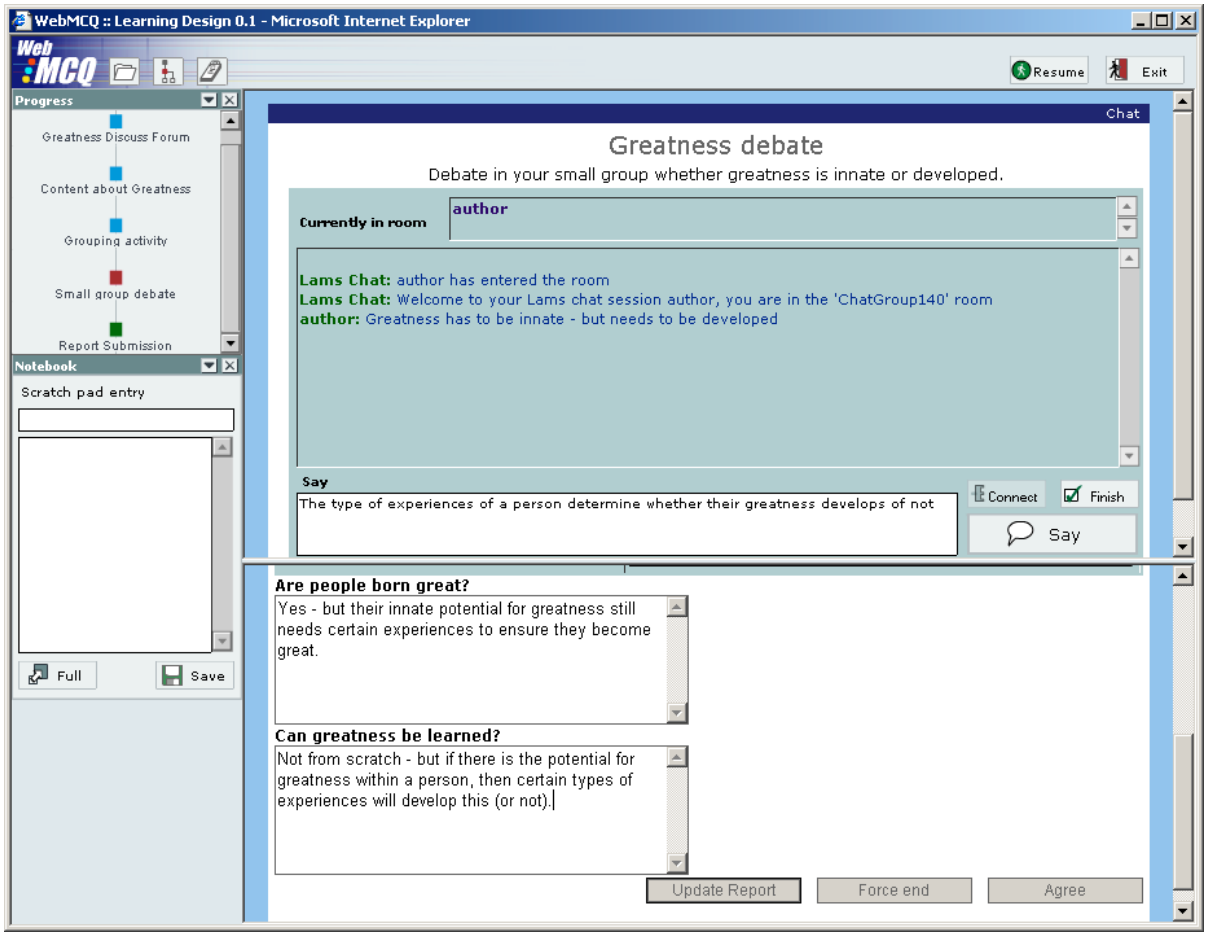

Figure 1: Screenshot of LAMS student environment, showing progress through activities in the top left, notepad middle left, and the current activity tool in the main panel (which in this case is a combination of a chat session – above - and scribe tool - below).

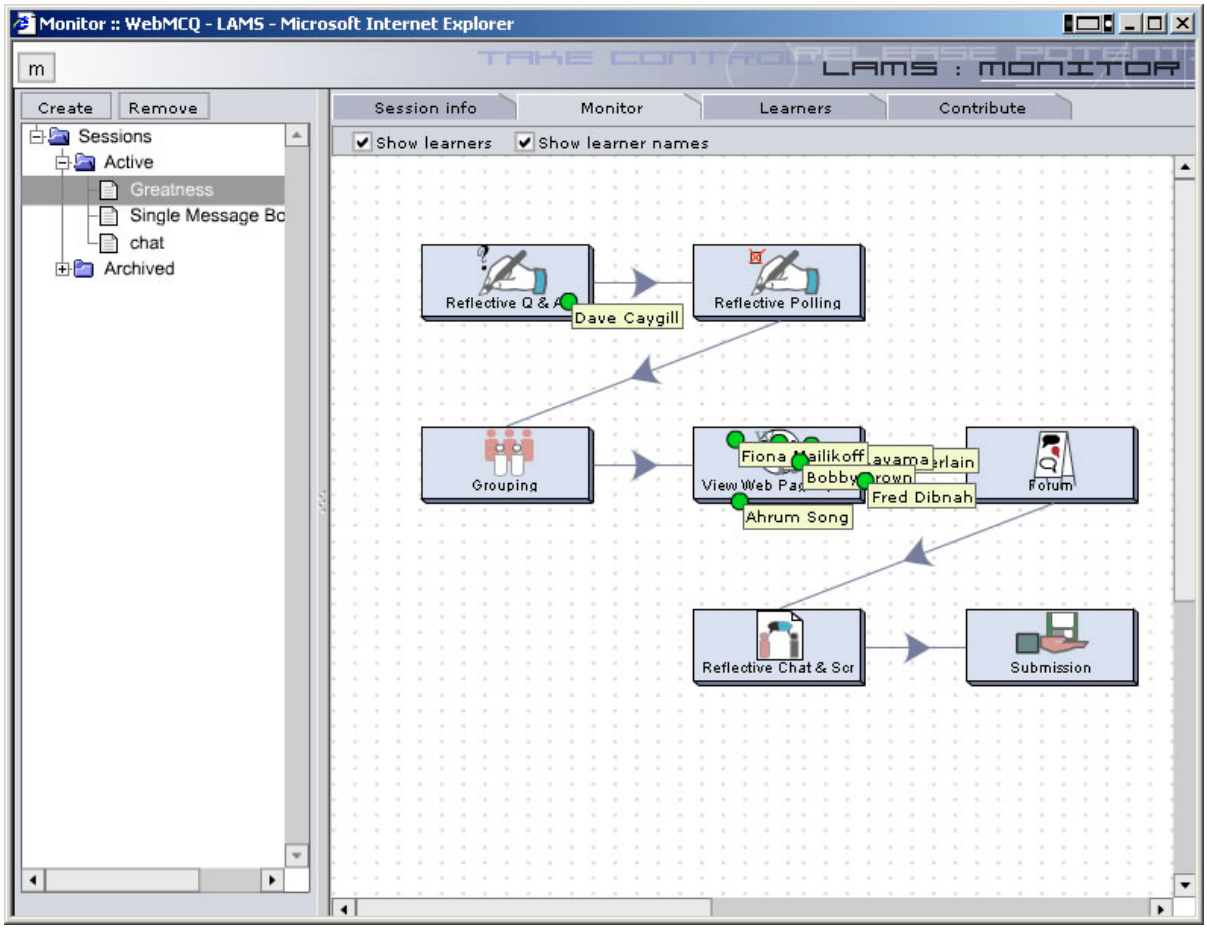

Figure 2: Screenshot of a LAMS (live) teacher monitoring environment, showing currently active sequences of the teacher on the left, and the current progress of students through a particular sequence on the right.

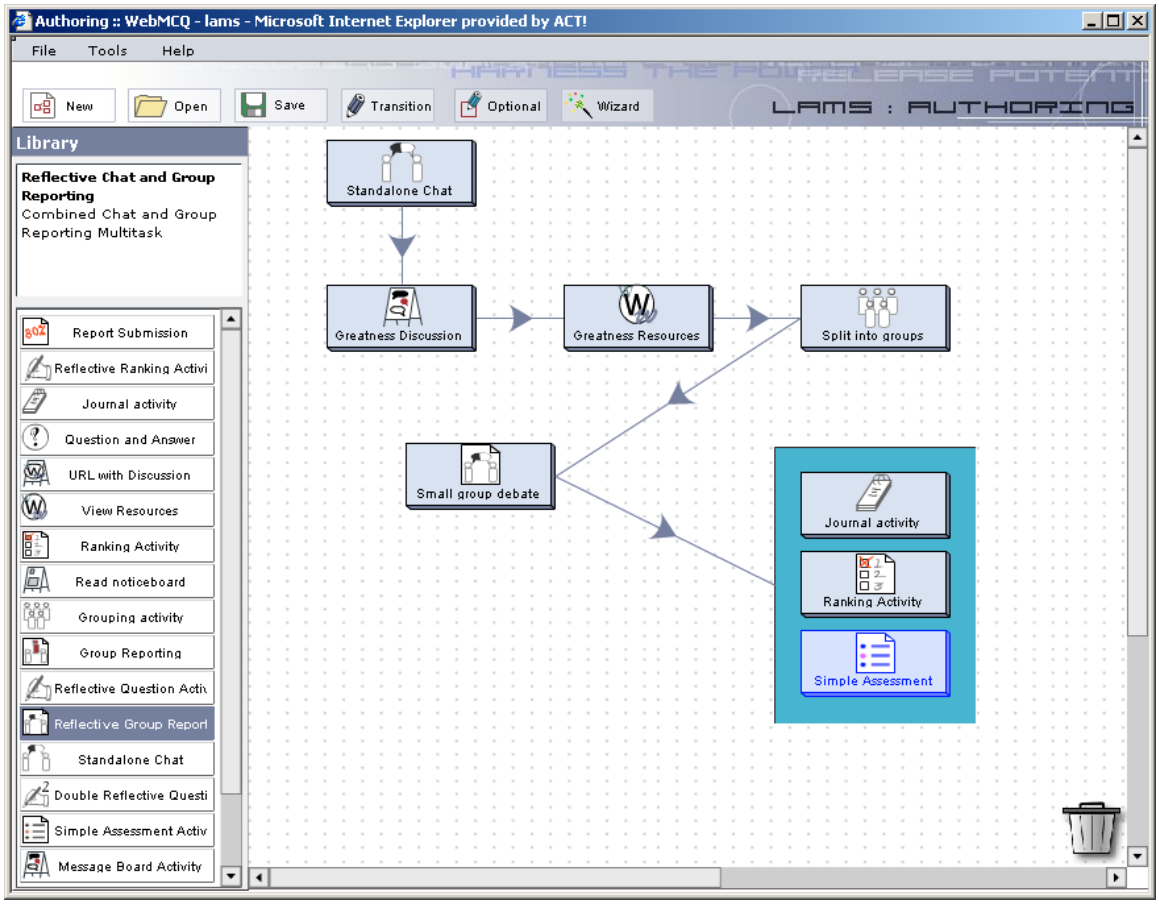

Figure 3: Screenshot of the LAMS authoring environment showing activity tools on the left, repository and sequence management tools across the top, and a sample sequence (including linear and non-linear components) in the middle.