Comparing Educational Modelling Languages on a case study:

Comparing Educational Modelling Languages on a case study: an approach using IMS Learning Design

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Abstract

This paper examines how IMS Learning Design (IMSLD) and the current generation of IMSLD based tooling can be used to model an e-learning case study in astronomy

1. Modelling the scenario

The approach adopted makes uses of the role of teacher, and a role for each of the teams, Team A and Team B. The teacher is assumed to assign the students to one or other of the teams (to one or other of the roles).

The case study is divided into two Acts. The first act covers the team-based activity of cooperating to understand more about the naming and ordering of the planets, with the teacher offering assistance. This Act is completed when the teacher sees fit. The second Act has an individual activity for the students to make the associations, with the teacher monitoring the activity, declaring a winner and completing the unit of learning.

A learning activity entitled "Cooperate to name and order the planets" is defined, together with a learning activity entitled 'Complete the questionnaire'. Two support activities are defined, "Monitor the student collaboration" and "Supervise completion of the questionnaire".

Extensive use is made of Environments containing Learning Objects and Services. The expert interviews are seen as Learning Objects. The forum is an IMSLD Conference of type 'asynchronous' and the chat rooms a Conference of type 'synchronous'. Both the role of Team A and Team B are participants in the forum, as is the Teacher role. In this way all participants in this learning process can make use of the forum. One chat room is associated with each of the teams so that only intra-team communication is possible. In the worked out scenario, the teacher has not been granted participant or observer rights so that the chat is essentially private to a team (this could be modified so that the teacher is afforded a window on the interaction).

Two Activity Structures are defined to reflect the different situations of Team A and Team B. Each contains a reference to the learning activity of "Cooperate to name and order the planets", and to the environment containing the shared forum service. In addition the Activity Structure for Team A has a link to an environment containing Team A's Expert Interview and Team A's chat room. Similarly, the Activity Structure for Team B has a link to an environment containing Team B's Expert Interview and Team B's chat room. In this way the cooperation and competition is facilitated.

In addition to participating in the forum, the teacher is given the opportunity to set a property indicating that the first Act should end. Once set, the flow of the process moves onto the second act where each user provides an answer (via an IMSLD locpers-property) to the ordering and naming question. The teacher is provided with a view on these answers (via the monitor service) together with a mechanism to end the process and declare the winner (via a feedback-description shown on completion of the second act and containing the value of a property through global elements in so-called imsldcontent).

2. Operationalisation

The above Unit of Learning can be created with the Reload LD editor [1]. Once a Unit of Learning has been exported as a Zip file, it can be uploaded into a CopperCore [2] based environment and played using a player such as the default player which accompanies CopperCore, or the SLED player [3]. Using administrative facilities, a run of the Unit of Learning

is created and individuals are manually associated with a role (Teacher, Team A or Team B).

Once this role allocation has been carried out, individuals can assess a web-player, with the flow of activities being arranged by the underlying engine.

The setting of properties by the teacher is supported in the current version of CopperCore, with the user interface control being generated from the type of the property (eg Boolean leads to combobox).

The monitor service, through which the teacher is able to follow the students' attempts at the questionnaire, is implemented within the player which accompanies the CopperCore engine. Further service integration into CopperCore-based environments has been the topic of recent R&D [4] and a loose level of integration has been achieved with Moodle. Through this integration, Moodle's forum services are used to facilitate the inter-team cooperation, including the teacher participation.

At the time of writing, no chat service has been integrated with the CopperCore Service Integration layer, although the TENCompetence project (www.tencompetence.org) will carry out integration of Jabber, the open source instant messaging service, in 2006.

One final point to mention is that the questionnaire could be implemented as a QTI item (see http://www.imsglobal.org/question/qtiv1p2/imsqti_asi_bestv1p2.html#1409410 for a drag&drop example in this domain). In this case the CCSI integration of the APIS QTI engine and the CopperCore LD engine leads to a multi open-technical specification scenario, in which the first steps to the harmonisation of specifications have been taken.

(Screenshots have not be included to save space, but the workshop presentation will include a walkthrough of the design and its realisation in IMSLD tooling)

3. Observation

Opportunities for observation or monitoring have been incorporated into the design. First, since the teacher is also a participant in the forum, s/he is able to observe events. Had the choice been taken to offer the teacher insight into the chat rooms, this could have been modelled either by making the teacher a participant, or an observer.

Further observational facilities are provided by the use of IMSLD's monitor service when linked to specific properties (eg responses to questions) for particular roles.

In terms of the way in which observations can be used to modify the activity's progress, possibilities can be included in the design to have activities, acts, etc be completed when a value is set. This can be as simple as having a flag be raised when a member of a particular role sees fit (as illustrated in this example), through to more complex conditions in which average scores or numbers of users completing can trigger further events

4. Traces

The use of learner traces is an active area of R&D [5, 6]. The example worked out above includes only limited traces due to the rather skeletal IMSLD Method section and an as yet unexplored area of R&D is the use of traces of interaction with IMSLD services.

5. Re-use/adaptation

The Unit of Learning can easily be turned into a template by modifying the resources to address a different topic (some changes to activity title and meta-data may also be necessary). In essence the Unit of Learning could be used for many different areas.

One interesting challenge with respect to the approach is to generalize to several teams depending on the cohort size. As the approach stands, the number of roles is fixed, but a solution which allowed any number of teams (perhaps incorporating a maximum number of team members) would clearly require a different approach.

6. References

[1] RELOAD, "ReUsable eLearning Object Authoring & Delivery," vol. 2004, 2004.

[2] H. Vogten and H. Martens, "CopperCore," vol. 2004, 2004.

[3] P. McAndrew, R. Nadolski, and A. Little, "Developing an approach for Learning Design Players," *Journal of Interactive Media in Education (Advances in Learning Design Special Issue)*, vol. 2005/14, 2005.

[4] H. Vogten, H. Martens, C. Tattersall, P. van Rosmalen, R. Nadolski, and R. Koper, "Integrating IMS Learning Design and IMS Question and Test Interoperability using CopperCore Service Integration," presented at Learning Networks for Lifelong Competence Development, Sofia, Bulgaria, 2006.

[5] C. Tattersall, J. Manderveld, B. Van den Berg, R. Van Es, J. Janssen, and R. Koper, "Self organising wayfinding support for lifelong learners," *Education and Information Technologies*, vol. 10, pp. 111-123, 2005.

[6] J. Janssen, C. Tattersall, W. Waterink, B. Van den Berg, R. Van Es, C. Bolman, and R. Koper, "Self-organising navigational support in lifelong learning: how predecessors can lead the way.," *Computers & Education*, In press.