Developing a pedagogically-driven process model for L20

Julie Watson
Manager of Academic Development
eLanguages, University of Southampton

Background

L20 is a JISC-funded Distributed e-learning Pilot Project. Led by the University of Southampton, a consortium involving 4 regional partner hubs have generated online re-usable learning objects (RLOs) from existing learning materials. These have then been tagged, stored and can be retrieved from the Projects customised learning object repository, CLARe, (Contextualised Learning Activity Repository) by learners and teachers for independent learning, classroom-based learning or blended learning according to particular need. In broad terms, L2O has aimed to evaluate the feasibility of re-using learning resources across the regional community and in different educational and teaching contexts, and for different purposes.

This case study will present the pedagogically-driven process model developed for the L20 Project, which has tried and tested an approach to transforming online learning materials into 'reusable learning objects'.

Challenges

The initial online learning materials for transforming into RLOs were submitted by Project partners in a variety of pre-existing formats. These included:

a) Multiple-choice, gap-fill, drag and drop type student exercises developed using Hot Potatoes

b) Complex and interconnected layers of web pages supporting sound files of full length lectures and associated activities bound together through a main index page

Two common obstacles to making such materials available as RLOs in their existing formats were, firstly, the lack of a micro–context and sufficient 'scaffolding'. Feedback and other learning support mechanisms, e.g. a transcript in the case of a listening task, to enhance independent learning were often absent in the case of a) above. The need for sufficient scaffolding had already been identified by eLanguages at the University of Southampton team as an essential requirement for the development of effective reusable learning objects (Watson, 2005). Secondly, another obstacle encountered was where the learning material was bound together as a large multiple resource as in case b) above. Where the level of granularity is set at 'course size' as in case b), any potential small reusable items of learning material the learning material contains cannot be captured by other users without taking on the whole package.

A further problem encountered was that in some cases a sound or video file might not be embedded with or linked to its task, which made it less accessible to the user for self-directed online use. So there were also a number of presentational issues of this kind that needed to be dealt with.

On receiving the existing learning materials from Project partners, an important first task for the Southampton team was the modelling of a process by which they could be effectively transformed into effective reusable learning objects. A pedagogically-driven model was developed in order to support the process of transforming existing online materials into RLOs.

Terminology

The process model aims both to facilitate the transformation of online learning materials into the format of reusable learning objects and capture any key metadata for the outputs, which are the reusable learning object(s) and pedagogic asset(s) that result from the process. A 'pedagogic asset' is the term created by the Project to describe:

…a resource, such as an audio extract, that has value for pedagogic purposes. The asset can be either a single resource or a collection of very small resources (for example a collection of 3 x 1 minute lecture introductions). Several pedagogic assets may be related to a single learning object, for example, an audio extract and a transcript of its content. (CLARe, 2006)

 A learning object, in contrast, is defined as:

…an interactive online resource which allows a learner to learn and/or practice a learning point connected with a skill, or a subject area. It contains both a resource for learning (pedagogic asset) together with an activity with a pedagogic aim and integrated support and feedback. A learning object can often be used both independently by the learner or in a blended learning context. (CLARe, 2006)

Pedagogic assets as well as reusable learning objects are ascribed metadata since they have implicit pedagogic value and this, therefore, allows them to be retrieved individually from a repository by learners or teachers.

The pedagogically-driven process model

The pedagogically-driven process for transforming existing learning materials into RLOs is divided into a set of tasks through which the learning materials are essentially broken down, catalogued and reassembled as reusable learning objects. A number of micro-processes or tools accompany each stage of this process. The complete process is represented in Figure 1.

The first step involves the **disaggregation** of an item of online learning material into its component parts. This requires separating out and categorising pedagogic assets (e.g. a sound or video file) from tasks associated with it along with any related activity lead-in, instruction, feedback etc. The latter elements will belong to any reusable learning object that may be developed from the learning material and do not form part of the pedagogic asset(s).

Any pedagogic assets that have been identified can then be **catalogued** and their corresponding metadata forms completed. The next step requires a coherent learning point or teaching concept to be **identified**. This might be one or several depending on the scope

offered by the material content. In effect, a learning objective or focus needs to be discerned for each of the reusable learning object(s) that may emerge (Wiley, 2001). In practice, a number of distinct reusable learning objects were produced from more complex packages of learning material with a high level of granularity whereas simple exercises that had been created using Hot Potatoes tended to produce just one reusable learning object, sometimes with several possible task options.

The stage at which one or more coherent learning points are identified and the following stage during which the learning materials are re-synthesized as reusable learning objects reflect a critical **decision point** in the process. At this point both creativity and foresight come into play to discern whether or not, the learning material provides sufficient scope for **re-use** as it stands; requires a degree of **repurposing**, or needs fairly drastic **remodelling** in order to transform it into one or more reusable learning objects. This decision will have been helped by the preceding stage of disaggregation and analysis of the constituent parts of the learning material.

From a series of developed templates, an appropriate selection can then be made and the reusable learning object(s) can be re-synthesized. Using the selected template, the various components (activity lead-in, task, feedback, other scaffolding etc) can be reworked and inserted together with the pedagogic asset to form a compete learning object. Reference to a style guide and/or checklist for the development of learning objects ensures that instructional and learning object design criteria are being met at this stage. Once the template has been used to produce the learning material in reusable learning object format, further **cataloguing** can be done and a metadata form for the learning object can be completed. The gathering of metadata that relates specifically to the learning and teaching context of use is particularly important for both the pedagogic assets and learning objects since it not only allows them to be stored in a repository, but also allows searching and retrieval by learners and teachers directly.

The final stages in the pedagogically-driven process model involve a **review** of the learning material in its new guise as one or more reusable learning objects and related pedagogic assets. Project partners peer reviewed each others' reusable learning objects using a blog especially developed for that purpose (L2O Sharing LOs blog) and other tools (e.g. SKYPE) enabling review and discussion of development issues were made use of. Where possible the review process was supported by student piloting and any necessary revisions were then undertaken. The reusable learning objects together with their captured and prepared metadata , enabling effective storage, searching and retrieval, were then **deposited** into the Projects customised repository, CLARe, enabling sharing by all Project partners.

Conclusions

The use of a clearly defined pedagogically-driven process for transforming learning materials into reusable learning objects had a number of benefits for the Project. The step by step approach helped guide the transformation of existing online learning materials into reusable learning objects in a clear, consistent and logical way. The completion of the metadata forms at fixed points in the process also ensured reflection and analysis of all component parts. RLO developers were also supported by being encouraged to think about the purpose(s) of the learning materials they were creating. By first disaggregating the

materials it was easier then to identify an appropriate template that could be used to re-synthesize selected components to form a reusable learning object.

References

CLARe Contextualised Learning Activity Repository (2006)
http://clare.eprints.org/information.html

Watson, J. (2005) *The Learning Object as developed by eLanguages*. Unpublished document.

Wiley, D. (2001) "Connecting Learning Objects to Instructional Design Theory: A Definition, a Metaphor, and a Taxonomy." *The Instructional Use of Learning Objects*. Wiley D.(ed) http://www.reusability.org/read/chapters/wiley.doc

Figure 1: A pedagogically-driven process model for L2O

Tasks　　　　　　　**Processes and Tools**

Disaggregate

Separation and Categorisation:
Into asset type and task(s) and related instructions.

Catalogue

Complete asset description form

Identify

Identify coherent learning point or teaching concept to be encapsulated
Refer to skills or concept checklist

- **Decision point**

**Re-use
Re-purpose
Re-model**

Map onto template and enhance/ add to (e.g. add scaffolding / lead-in.)
Refer to style guide or checklist

Catalogue

Complete the Learning Object descriptor form

Review

Submit for peer review or student pilot.
Make any necessary revisions

Deposit

Submit to repository for indexing.