

Enhanced Collaboration with Re-usable Learning Objects

Lynette Johns-Boast and Kim Blackmore

*ANU College of Engineering and Computer Science, The Australian National University, Canberra, Australia
Corresponding Author Email: Lynette.johns-boast@anu.edu.au*

BACKGROUND

The Engineering Hubs and Spokes Project (H&S)¹ at the Australian National University (ANU) and the University of South Australia (UniSA) facilitated the collaborative design, development, and delivery of a variety of engineering courses. The project demonstrated that cross-institutional collaboration can lead to improvements in course quality, spread workload, and be effective professional development (Blackmore, Compston, Kane, Quinn, & Cropley, 2010).

Joint delivery of courses by the two institutions, however, may not be sustained in the long term, principally because of the difficulty of working across two administrative systems. Therefore we are looking to create a new, sustainable system for cross-institutional collaboration in course design and development.

PURPOSE

We aim to facilitate ongoing collaboration in design and development by creating a shared courseware repository, initially populated with artefacts created through the Hubs and Spokes project. Our repository will:

- encourage and seek ongoing development and refinement of material as successive users update the material – content and rationale – while tailoring it for their purposes;
- be structured using the principles of constructive alignment and will include content, learning activities, assessment, all of which will have a clear rationale linked to learning objectives. Each “nugget”² will have sufficient metadata to allow easy location in a course following the principles of constructive alignment; and
- be stored in a reusable format so that materials can be used natively, readily reformatted for different delivery software, imported into different learning management systems, and will be compliant with various standards including the IEEE learning object metadata (LOM)³ and web accessibility.

While a range of open-access LORs exist⁴, there is limited facility for linking updates of the material as it is refined and reused in different contexts. In addition, the “owning body” (for example the Universities of Southern California in the case of MERLOT) has control over the associated metadata and the repository itself. This is unpalatable to many of the contributors to Hubs and Spokes, so we need to create a repository with restricted access.

DESIGN/METHOD

This project is action research (Reason & Bradbury-Huang, 2008) and is planned to have a number of iterations, with feedback from the previous iteration informing the next iteration of research. In the early stages, feedback will come from the academic developers and researchers closely involved in the project. In the second stage, the course coordinators who have been involved in creating and using course materials in the Hubs and Spokes project will be consulted. Finally, the feedback group will be extended to include new course

¹ Funded by the Australian Government Department of Education, Employment and Workplace Relations

² A “nugget” is the smallest component of a Learning Object, for example, a single examination or test question.

³ IEEE LOM http://ltsc.ieee.org/wg12/files/LOM_1484_12_1_v1_Final_Draft.pdf

⁴ For example MERLOT, <http://www.merlot.org/>, OpenCourseware, <http://www.ocwconsortium.org/>

coordinators seeking to join the collaboration and reuse materials from the repository in their own courses.

INTERIM FINDINGS

We have completed an initial search for open source Learning Object Repository (LOR) software which included the necessary functionality related to developing and managing digital material. A number of promising options were found, however in each case they were a few years old, there was no active community using the system and on-going support proved unavailable.

Consequently, we decided to use the open source SAKAI⁵ educational software as offered and supported at the ANU. We extended the Dublin Core⁶ metadata used by SAKAI to incorporate many of the IEEE LOM attributes. Once the core of the repository was ready, material was loaded using the SAKAI generated interface. We suspected that this interface would be inadequate but we needed to determine whether the concept of using SAKAI was feasible. Even for an academic developer who had been intimately involved with developing the course material and with the tailoring of the standards it involved significant cognitive effort to determine the appropriate metadata tags.

A second development stage was then undertaken, incorporating feedback gathered from the uploading process into the initial development of a bespoke java interface. The new interface better supports the workflow around loading material into the repository and assigning the appropriate metadata and copyright permissions, and facilitates discovery of material stored within the repository.

FURTHER RESEARCH

The next stage of the research includes validating the metadata tags used. The IEEE LOM standard was developed by technologists to facilitate the storing, discovery and re-use of the material and does not really take account of an educationalist's point of view. We will develop metadata tags to facilitate the association of "nuggets" with various learning outcomes. The aim is to enable building constructively aligned learning objects through the combination of different "nuggets" which meet the required learning outcomes. A later stage will involve incorporating software for the development of learning objects that separates the content from the presentation software / method.

CONCLUSIONS & CHALLENGES

We believe there is great potential in providing a means of discovering quality, peer-reviewed learning material which can be used to facilitate creation of quality courses. Such reuse could simultaneously improve quality and reduce overall cost to learning institutions.

A number of challenges exist however, including difficulties obtaining institutional endorsement of this approach to constructing course ware, and actually getting academics to contribute to and use the repository, as this impinges on their valuable time which is already in short supply

REFERENCES

- Blackmore, K., Compston, P., Kane, L., Quinn, D., & Cropley, D. (2010). The Engineering Hubs & Spokes Project - Institutional Cooperation in Educational Design and Delivery. *ACSILITE*.
- Reason, P., & Bradbury-Huang, H. (Eds.). (2008). *The SAGE Handbook of Action Research: Participative Inquiry and Practice*. SAGE Publications.

KEYWORDS

Reusable learning objects; Learning object repository; Standards; Learning Object Metadata

⁵ SAKAI, <http://www.sakaiproject.org/>

⁶ Dublin Core, <http://dublincore.org/>