Using learning design as a framework for supporting the design and reuse of OER

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Abstract

The paper will argue that adopting a learning design methodology may provide a vehicle for enabling better design and reuse of Open Educational Resources (OERs). It will describe how a mind mapping tool, Compendium, is being used to help designers and teachers create and share learning activities. It will consider how initial evaluation of the use of the tool for learning design has been positive; users report that the tool is easy to use and helps them organise and articulate their learning designs. Importantly the tool also enables them to share and discuss their thinking about the design process.

Introduction

Research and development activities around OERs and associated issues have increased dramatically in recent years; and Downes (2007) notes that there are numerous arguments being put forward for their benefits and application. Hylén (2006) discussing some of the opportunities and challenges associated with OERs raises three main challenges: the lack of awareness of copyright issues, quality assurance and sustainability. However, this paper argues that a central challenge to the successful uptake of OERs focuses on the design process and goes on to argue that a clear framework to enable effective design is needed to ensure that OERs can be adapted and reused.

We have previously argued that there is a gap between the *potential* of technologies to support learning and the reality of how they are *actually* used and that this is due to a lack of understanding about how technologies can be used to afford specific learning advantages and to a lack of appropriate guidance at the design stage (Conole *et al.* 2007). This paper puts forward a potential solution to these issues and outlines the basis for a learning design methodology which might be adapted and applied in an OER context. It describes a project which is exploring the design for learning issues within a distance learning institutional context, the UK Open University. The initial focus of the work is reported elsewhere (Conole *et al.*, 2007, Conole, forthcoming), this paper will focus on how we are using Compendium as a tool for aiding the design process. It will describe the rationale behind the work and initial findings from the evaluation of eight faculty-based workshops run using the software.

Our goal is to build on recent research on learning design to develop a tool that provides support in the course design process with an emphasis on the use of technology-enhanced learning. Learning design refers to the range of activities associated with creating a learning activity and crucially provides a means of describing learning activities.[1] Users of the system would include both course teams as well as others involved in the design process such as learning technologists or those tasked with helping course teams translate their ideas into technical solutions. The learning design tool will act as a bridge between good pedagogic practice and effective use of new technologies.

We have identified six main reasons why adopting a learning design approach is beneficial (Conole *et al.*, 2007):

1. It can act as a means of eliciting designs from academics in a format that can be tested and reviewed with developers, i.e. a common vocabulary and understanding of learning activities.
2. It provides a means by which designs can be reused, as opposed to just sharing content.
3. It can guide individuals through the process of creating new learning activities.
4. It creates an audit trail of academic design decisions.
5. It can highlight policy implications for staff development, resource allocation, quality, *etc.*

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[1] We are aware of the long history of work in Instructional Design but believe the term 'learning design' better describes the methodology and approach we outline which is inherently holistic and contextualised in nature. See Conole, forthcoming for more detail.

6. It aids learners in complex activities by guiding them through the activity sequence.

The OU is currently undertaking a cross-institutional Learning Design project. We are adopting an iterative methodology focusing on two areas of activity in parallel: a) capturing and representing practice – through user consultation and case studies and b) supporting learning design – through the development of an online tool and associated workshops. The online tool will be populated with both the information derived from the case studies, as well as selected resources and expertise drawn from our own experience in the field and the wider research literature.

Design is inherently a creative and messy process, dependent on a rich range of interconnected factors, so one approach is likely to meet the needs of all users. Therefore part of our philosophy in terms of developing a specification for the online learning design tool is that it needs to accommodate the following characteristics, rather than impose a single 'correct' way of working:

• It operates at different levels, for example high-level learning outcomes, down to assets.

• It combines different types of activity, for example planning pedagogy, creating resources, specifying support, *etc.*

• It is an iterative process; an individual may switch between levels.

• Users will approach the design process from different perspectives; working from available resources, from assessment, or with specific technology in mind.

• It is both an individual and a group process.

Our initial discussions included the development of a use case scenario of how such a tool might be used. We envisaged the tool providing a number of elements which need to be considered in the creation of a learning activity, such as what tools, resources, or roles might be involved. Each of these would have a number of predefined aspects derived from our survey of OU practice and external projects. From their preferred starting point users could drag elements onto their workspace and start to build up their learning activity. The system will then prompt related elements, for example, if the user has selected a collaborative activity, then tools such as asynchronous conferencing, wikis *etc*, will be shown, along with additional advice and examples. The user would then build up an activity sequence, adding in conditionals and roles. The tool will prompt the user to add in required data, e.g. learning outcomes, estimated study time. In addition, if the activity is part of a course, then the system will import data from existing administrative systems, relating to level, subject area, etc. All designs will be saved to a repository thus increasing the range of designs for future users to draw upon. The system will build on user input, using web 2.0 principles, including user tagging (tag clouds) to demonstrate popularity, data mining established links between designs and tools, user comments, *etc.*

We are adopting an iterative process to the development of the prototype tool with the close involvement of the intended end users, so that we could learn from their use of the prototype and adapt accordingly. We felt such close user involvement will help us to identify how users interact with the different features of the tool as well as indicating what kinds of support and advice they find useful.

We selected the mindmapping software Compendium as our initial prototype for the learning design tool for a number of reasons. Firstly because it was produced at the Open University, we felt there was more opportunity for further tool development specifically in terms of learning design requirements. Secondly, Compendium supports the creation of a range of visual mapping techniques, including mind maps, concept maps, web maps and argumentation maps (Okada and Buckingham Shum, forthcoming), which we felt offered the potential for a range of flexible approaches to the design process. Compendium comes with a predefined set of icons (question, answer, map, list, pros, cons, reference, notes, decision, and argumentation). The creation of a map is simple, users drag icons across and can start to build up relationships between these through connecting arrows. Each icon can have an associated name attached with more details contained inside the node, an asterisk appears next to the icon and if the user hovers their mouse over this the content inside the node is revealed. Other types of electronic files can also be easily incorporated into the map such as diagrams, Word files or PowerPoint presentations. The reference node enables you to link directly to external websites. Icons

can also be meta-tagged using either a pre-defined set of key words or through user generated terms. Maps can be exported in a variety of ways from simple diagrammatic jpeg files through to inter-linked websites.

Figure one illustrates a learning design mapped out in Compendium, it represents a case study on the use of a wiki to undertake a collaborative requirements gathering exercise in computing. Two roles are shown (tutor and student), along with the respective tasks. Associated tools, resources and outputs associated with each task are shown alongside, with arrows indicating connections. Minocha *et al.* (2007) provide a description of the development of this particular learning activity and how it is being evaluated.
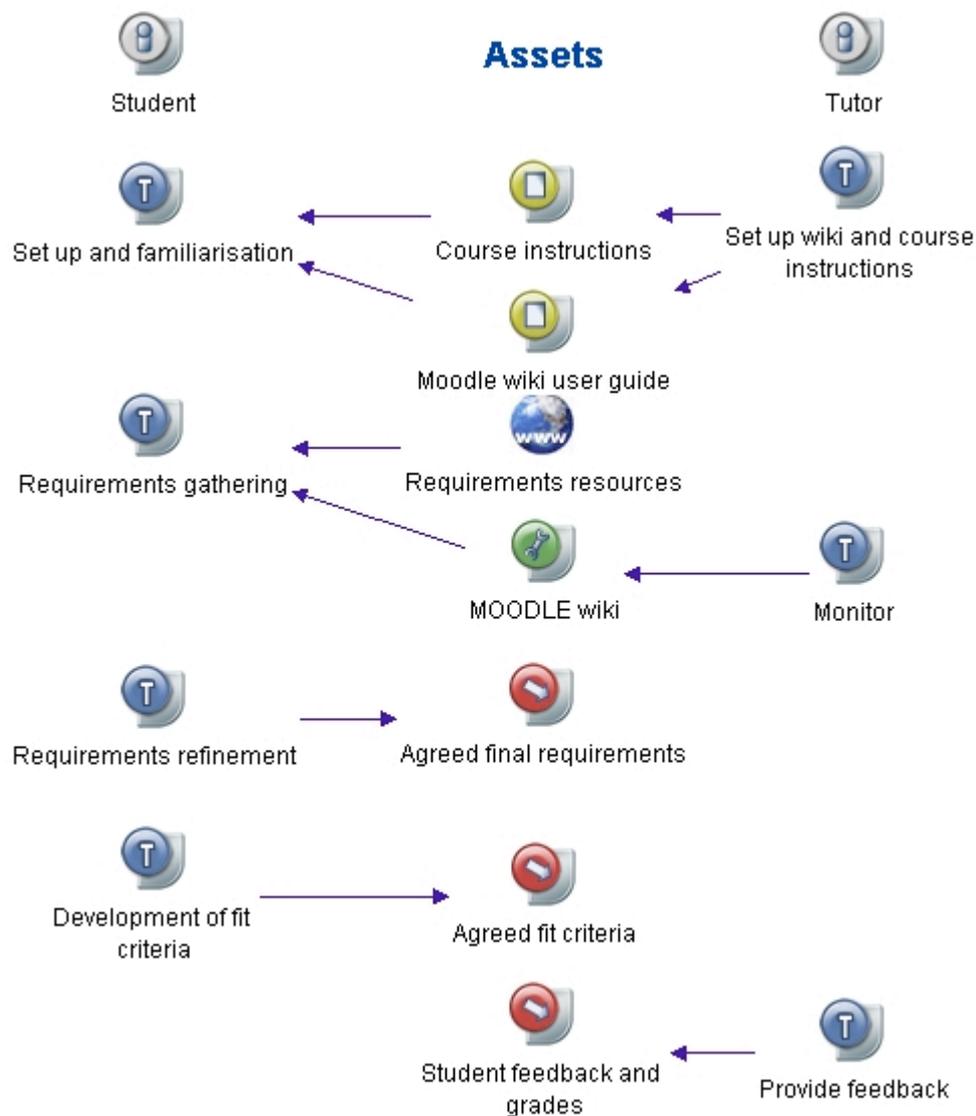

Figure one: Visual representation of a collaborative activity using a wiki

We created a dedicated set of learning design icons, to complement the generic set available within the tool. As part of the core functionality of the tool it is possible for users to create and incorporate their own 'stencils' of icon sets. Once the appropriate set of icons have been identified, they are labelled with appropriate text and given an overarching stencil name set. We choose to focus on a simplified list of icons to represent what we felt were the key aspects of the design process, namely: task, role, tool, resource, output, group, assignment, and activity. All of the icons are of the same type except for the activity icon which is a variant of the generic map icon. As with the core Compendium icon set users are able to rename each of the icons to something more appropriate to their context. Once created the stencil set is opened via the tool drop-down menu. Figure two provides a screenshot of

Compendium, showing the generic set of icons on the far left-hand side, along with the learning design stencil 'LD2' we created.
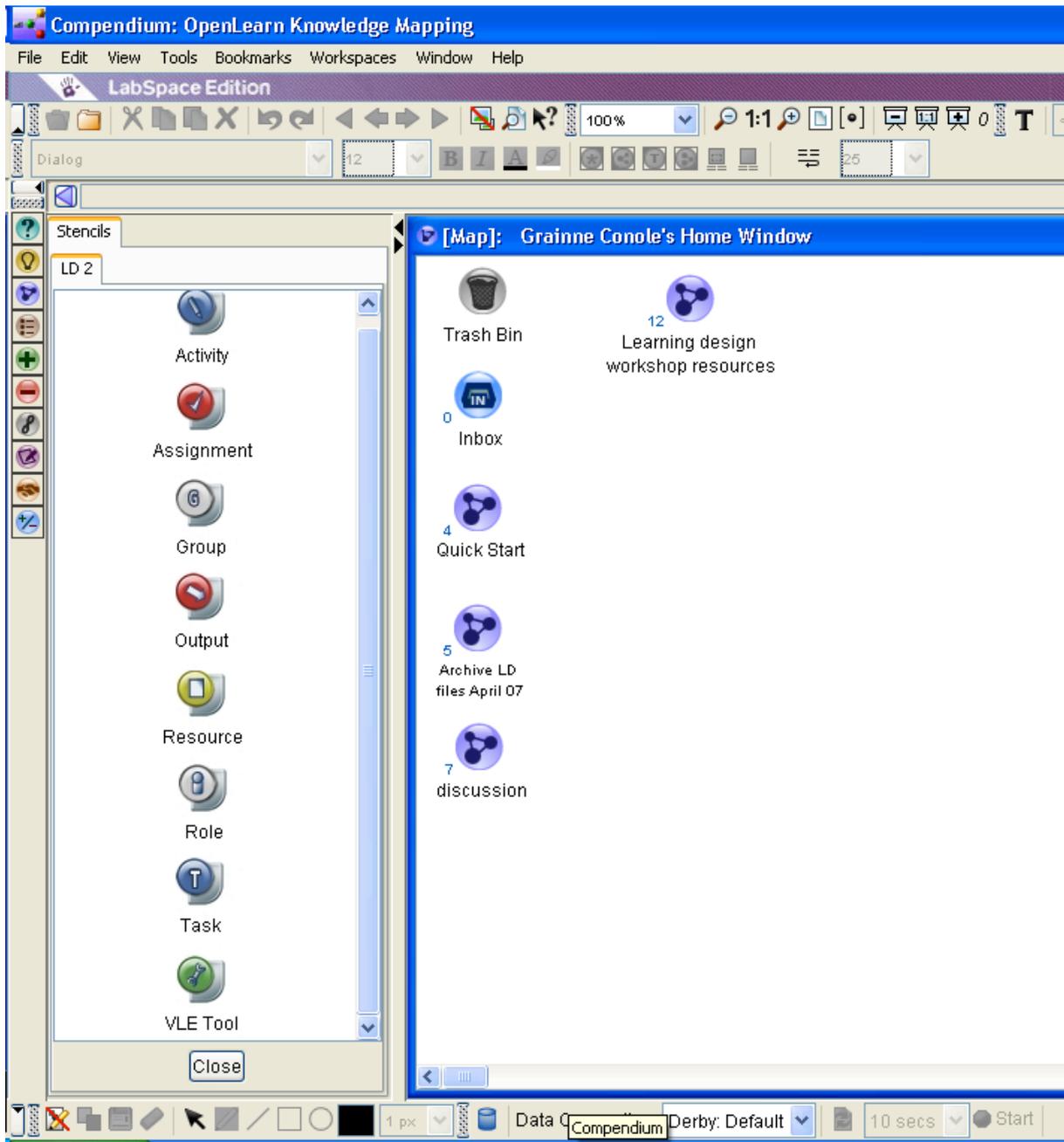

Figure two: Screenshot of Compendium with the LD2 learning design stencil set of icons

We used the new stencil set as a means of representing the learning activities being described in the case studies. As we began to represent this and based on feedback from users we realised that our initial iconic representation was overly complex and so we fixed on a simplified approach which consisted on a column for each role (student, tutor, *etc*) and an associated column for the 'assets' associated with that role (i.e. any resources, tools or outputs).

We also wanted to experiment with using different means of supporting the design process by creating a set of adaptable templates which users could work through and adapt to their own context. In addition to the creation of iconic stencil sets, Compendium also enables the user to create customisable templates. A template is a Compendium xml export file, which holds a set of maps/nodes which the user might use frequently. We used this template facility to create a series of learning design templates focusing on a core set of different approaches to the design process:

1. Simple step-by-step guidance. Figure three provides a screen shot showing the LD template set on the side, along with the open 'Step-by-step' template.

2. Empty 'swim line' style diagrams showing the key components for creating a diagram.

3. Mapping templates: a simple one linking learning outcomes, tasks and assessment and one linking tools, discipline problems, outcomes, assessment learning activity and topics covered.

4. Two focusing on the 'affordances' (Conole and Dyke, 2004) that different tools and activities potentially offer.
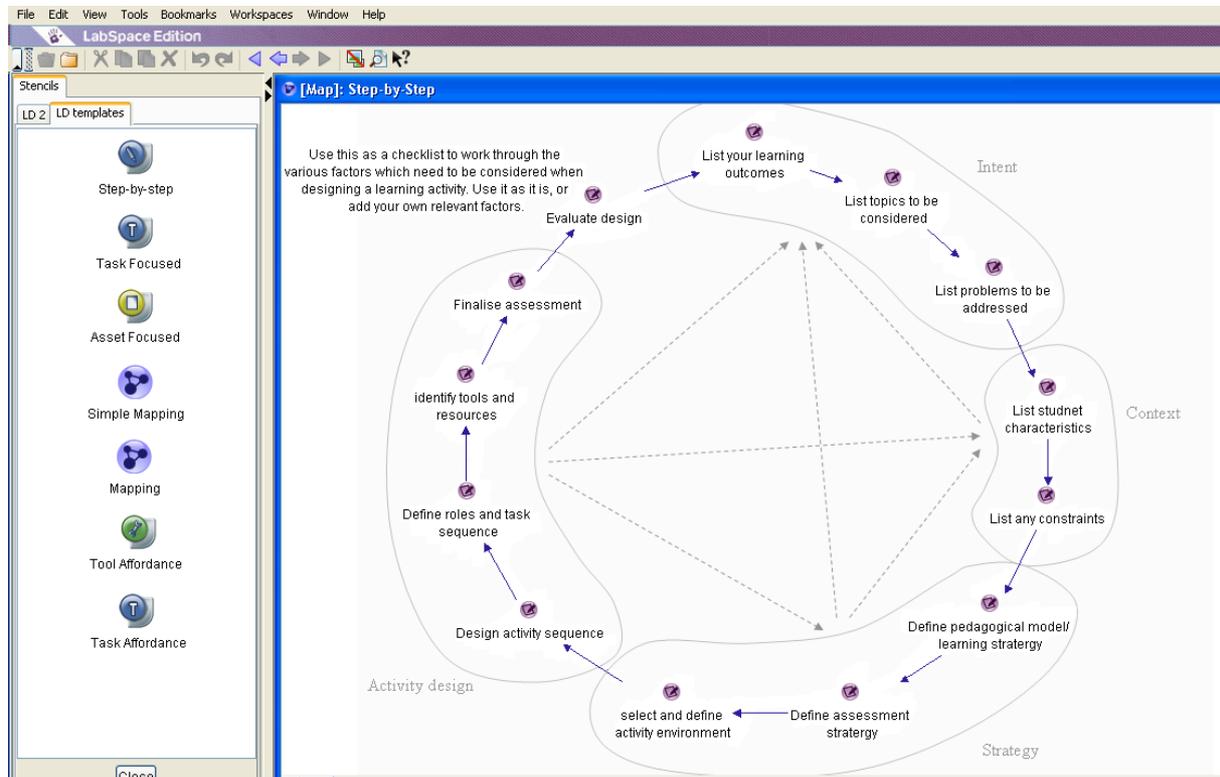

Figure three: The seven LD templates with the step-by-step template open

During March and April 2007 these resources were trialled through a series of workshops. The first consisted of a group of critical friends made up of e-learning researchers and educational developers. Feedback from the workshops has been very positive with attendees reporting that they liked Compendium, found it easy to use and a useful tool to help them not only think about and articulate their design process, but also as a means of representing and sharing their design. However a number of issues remain; some users find it difficult to think visually, the prototype currently operates at a micro-granular level of activity and does not enable the user to switch to consider macro-design issues at the course level, and despite the relatively easy interface some users are likely to require more training and support than others. In addition it is unclear yet how such a tool might be used over a longer time frame within a collaborative course team to build up a shared and evolving design artefact.

We are now adapting these workshops for use in an OER context as part of the OU's OpenLearn project and will be able to report back at the conference. In particular we want to evaluate how the use of this approach might support the development and reuse of OERs. We continue to refine the functionality of the tool and are currently exploring how to integrate an adaptive set of help facilities.

Conclusion

The paper has discussed how adopting a formal learning design methodology might enable better creation and reuse of OERs. It has described the approach we are adopting at the Open University, including the rationale for our approach and the features of the prototype we have developed. Initial findings from an evaluate of its use are reported.

This is a challenging area rife with a range of issues both pedagogical and technical. Most importantly it is unclear yet *how* such an approach might be adopted and taken up by the community and to what extent it might help with the ultimate aim of facilitating easier and more frequent use of OERs. However despite this we believe adopting this learning design methodology is a useful approach for formalising and hence capturing existing practice and a mechanism for identifying associated barriers and enabled to uptake and reuse. The conference presentation will present a summary of process to date.

Acknowledgements

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