ADOPTION OF LEARNING DESIGNS IN TEACHER TRAINING AND MEDICAL EDUCATION: TEMPLATES VERSUS EMBEDDED CONTENT

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Abstract
One of the ongoing challenges in the field of Learning Design is how to most effectively support educators in the development of innovative e-learning through the adoption and adaptation of learning design templates. This paper reflects on experiences from two recent higher education projects in teacher training and medical education, and considers the advantages and disadvantages of templates as compared to learning designs with embedded discipline content.

Keywords: Learning Design, Teacher Training, Medical Education, templates, LAMS

Learning Design and e-learning innovation

While much of the early development of the field of Learning Design focussed on technical standards and software implementation (e.g., IMS, 2003), more recent developments have emphasised how Learning Design can assist educators to reconceptualise their approaches to teaching and learning, and as a result, to encourage innovation in e-learning (eg, Laurillard, 2007; Conole & Culver, 2009). While there will always need to be a foundation of technical work to support software to implement Learning Design, the shift of focus away from technical issues and towards professional development for educators and innovation in course development marks an important step towards the broader impact of Learning Design on education.

To assist educators to consider novel teaching approaches, Learning Design research seeks to describe, share and re-use effective teaching strategies. These strategies can take the form of well documented generic pedagogical approaches such as role plays, Problem Based Learning, Predict – Observe – Explain, etc (Dalziel, 2010), or they may be more "anecdotal"

good teaching ideas that have been found effective in an individual educator's course (which are later shared with others). The LAMS Community (www.lamscommunity.org) contains a repository of over 800 shared learning designs which includes examples of both "generic" and "local" designs, and there has been ongoing discussion of the benefits of each type of sharing.

The key difference between these two types of designs is the role of discipline-specific content. A "local" design combines discipline-specific content together with an implicit (or explicit) pedagogical approach that results in a "ready to use" learning design (in the sense that a colleague from the same discipline area who agrees with the discipline content could use the shared design immediately in an appropriate class, i.e., without modification). A "generic" design (or template) may contain content related to the pedagogic design (e.g., an initial page for students that contains instructions about how many steps there will be in the sequence and what kind of activities will occur at each step), but by definition it does not incorporate discipline-specific content – rather, the generic design is structured in a way that it encourages educators to insert their own relevant discipline content into the generic design, hence transforming it into a local, ready to use design. A template could be used for multiple topics within a single discipline, or ideally across multiple disciplines.

An important tension exists between generic and local designs – the local design is often perceived as more useful by a discipline expert as it contains relevant content ready for immediate use (Dalziel, Mason & Dalziel, 2009). Even if the discipline content is modified by a subsequent educator who is re-using the original local design, the embedded content may assist the subsequent educator to more easily imagine how to adapt the design to their own topic by considering the starting example which displays familiar discipline material.

However, the downside of this approach is that it does not draw attention to the re-usable nature of the underlying pedagogical approach, and hence the potential impact of this teaching strategy may be greatly limited by being "bound" to a particular discipline. For example, if Problem Based Learning was only ever considered in terms of medical education, then the benefits of this teaching approach might not propagate to other disciplines which could also benefit from the pedagogical approach of this teaching strategy.

For generic templates, even though they explicitly address the issue of propagation across discipline boundaries by their very nature, they may in practice fail to excite experts in any given discipline due to a lack of familiar (discipline) content. Anecdotal reports from the LAMS Community and related work suggest that some educators find generic templates to be "lifeless" or otherwise uninspiring, whereas designs with embedded discipline content provide more inspiration (Dalziel, 2007). This paper reflects on these challenges in the

context of two recent university projects – one in the area of teacher training, and the other in medical education.

Overview of projects

The first project, "Implementing Effective Learning Designs," investigated the use of Learning Design in teacher education in a number of Australian university pre-service teacher education programs, including both undergraduate and postgraduate courses. The first author of this paper led this project.

The second project, "Renewing the Curriculum to More Effectively Accommodate Clinical Rotation," investigated the use of Learning Design to support the development of e-learning modules for the understanding of scientific knowledge among later year undergraduate medical students. These modules were conducted during a period of the students' studies where much of their time is spent inside a range of different hospitals. The two authors of this paper were co-leaders of this project.

Both projects were funded by the Australian Learning and Teaching Council (ALTC) – the first under the Competitive Grants program, the second under the Priority Projects program. They ran concurrently from late 2008 until the end of 2010, with project wrap-up and documentation in 2011. Given the parallel progress of the projects and their shared interests in Learning Design, they provide an interesting opportunity for reflection on the issues of generic and local designs as outlined above.

Before discussing each individual project, it should be noted that the word "template" was a topic of debate within both projects. For the sake of clarity, we refer to a "teaching strategy" as a generalised form of a set of practical steps for teaching, based on a particular method, e.g., Problem Based Learning, Predict – Observe – Explain, role plays, etc. A learning design template is a "runnable" instantiation of a particular teaching strategy where the instructions for running the strategy are provided, but the discipline content still needs to be added by the educator. A (runnable) learning design is a sequence of activities for students which includes both an underlying teaching strategy (either implicit or explicit) as well as discipline content – a learning design may be created by adding content to a learning design template, or it may be created "from scratch" by an educator – that is, both activities and content are created at the same time to create a sequence. For completeness, a "teaching theory" (such as constructivism) could be thought of as a more abstract, higher order approach to teaching and learning that might influence the structuring of a teaching strategy (which may, in turn, influence the structure or a learning design template or learning design).

For some educators, learning design templates were seen as helpful exemplars of potential teaching strategies, which also provided ready-to-use instantiations of these strategies to decrease the time required for implementation. In other cases, educators reacted to the idea of learning design templates as if they implied the imposition of a "straight-jacket" that would limit their potential creativity in designing effective learning. These educators often built their own learning designs from scratch, and yet in subsequent discussion (particularly in the medical education project), it became apparent that these new designs were often influenced by teaching strategies and learning design templates they had seen earlier.

The issue here seems not to be the templates themselves, but the way they are perceived in the process of designing learning. Templates are best seen as a form of "inspiration" for effective teaching ideas – where it is understood that any benefits arising from the template must still be adapted to suit discipline requirements and local teaching contexts, including the needs of educators and their students. This way of using learning design templates is reminiscent of the "creative jump" step in the use of educational patterns within the pattern literature (McAndrew, Goodyear & Dalziel, 2006).

Teacher education ALTC project

The development and adoption of learning design templates was an evolving focus of the teacher education project. Through an iterative process of creating and sharing LAMS learning design templates with educators, accompanied by online pedagogical advice about the use and adaptation of these templates, the project refined its approach to template sharing.

Despite initial attempts, it was found that educators generally did not like being given a wide range of different possible versions of a given teaching strategy when they are considering this strategy for the first time. For example, there are many ways that an online role play could be structured, including decisions about the choice of learning tools for student interactions (e.g., forum versus chat), the timing of the role play (e.g., synchronous versus asynchronous), and number of steps in each phase of the role play, etc. While in theory these are all important issues for an educator to consider when implementing an online role play, in practice, educators felt overwhelmed when given a wide range of choices (i.e., a wide range of slightly varying learning design templates) early in the process of considering a teaching strategy. Anecdotal feedback suggested that when an educator is considering a new teaching strategy, they first want to understand the "essence" of the new approach, rather than

be presented with many small variations in its possible implementation (the breadth of variations was experienced as "information overload").

Based on educator suggestions, later iterations focussed on providing just two learning designs for a given teaching strategy – a "worked" example with embedded (discipline) content, followed by a generic template version of the worked example with the discipline content removed. The generic version included additional advice about how to add discipline content into the template. This approach of providing two core examples has since been adopted in other LAMS work, such as the library of templates available through the "LessonLAMS" website (www.lessonlams.com). An example from LessonLAMS of this approach can be seen in Figures 1 and 2, where Figure 1 shows an example of the brief pedagogical advice to accompany a role play template, while Figure 2 shows a worked example of a role play about the pros and cons of adopting interactive whiteboards in a typical school (at the top of the page), and a generic template version of the role play at the bottom (only partly shown due to space constraints). Note that Figures 1 and 2 come from a single webpage.

In some cases, extra templates were provided separate from the two core examples (e.g., in addition to the core role play example based on two roles – "pro" and "con" – a role play with four roles was also included), but any additional examples were placed in a subsidiary location (accessed via a link at the bottom of the page) so as not to distract educators from the two core examples during early exploration.

A related "information overload" problem was found with pedagogical advice to accompany the design. Early iterations provided considerable pedagogical information to accompany the "ready to use" templates – however, anecdotal reports from educators noted that more than about half a page of (online) text about the teaching strategy was often ignored in preference for live use of the template (both in "Preview" mode to show the student view and in LAMS authoring for editing). It seemed that educators had a preference for rapidly moving to "hands on" use of the templates rather than reading extensive theoretical background about the teaching strategy. As a result, later iterations of the pedagogical advice were minimised to capture the essence of the teaching strategy in a few half page text descriptions prior to access to the "hands on" version in LAMS.

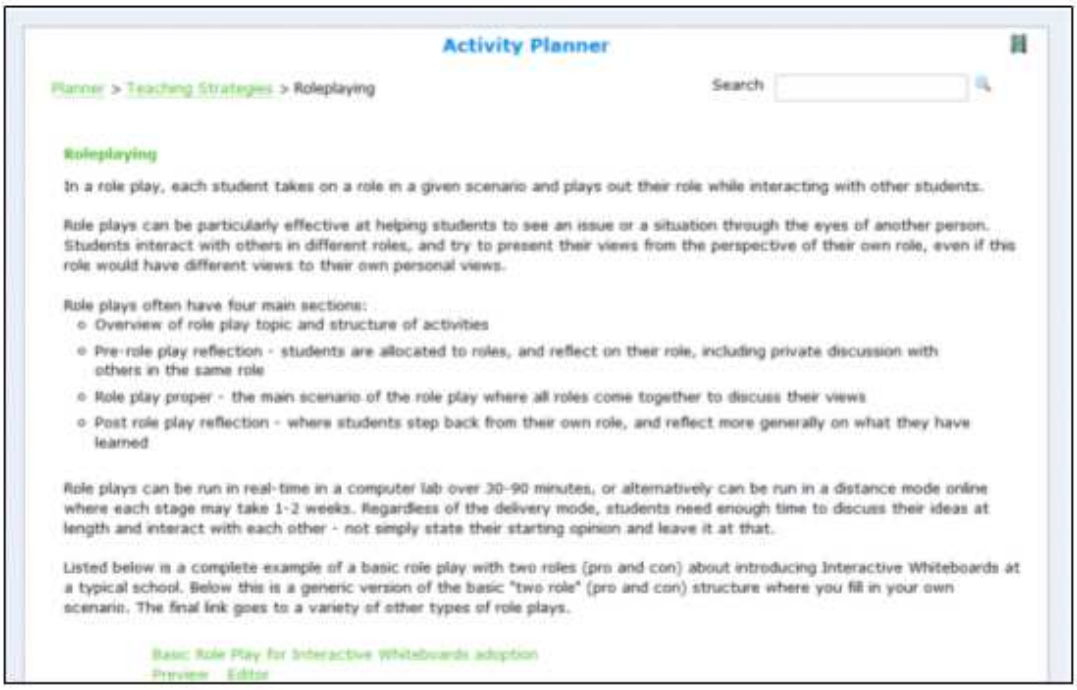

Figure 1: Example of brief pedagogical advice to accompany role play teaching strategy

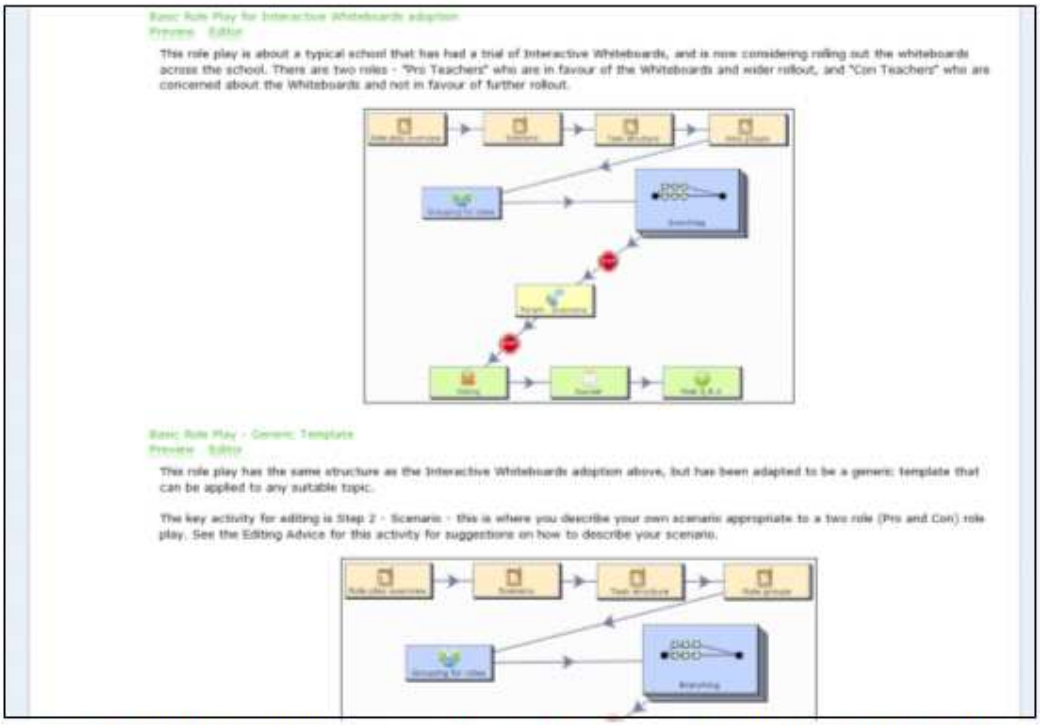

Figure 2: Content example and generic template of role play teaching strategies, including links to a live preview of the student version and the editing area for teachers.

Later in the project, a number of other templates were developed, such as a range of templates inspired by De Bono's "CoRT" teaching strategies. One of the salient aspects of developing

these templates was that although many of De Bono's teaching strategies are relatively simple, it took many cycles of development and refinement to produce an appropriately structured LAMS template. Much of the iterative development was focussed on the choice of appropriate activity tools to implement the particular strategy, the phrasing of student instructions, and the advice that was incorporated into the templates to assist educators to later adapt the templates to their chosen discipline topic. Project templates, together with other project information, are available at http://implementinglearningdesigns.lamsfoundation.org/.

Towards the end of the ALTC project, a separate project conducted with the Open University UK saw the development of an "embed" feature for LAMS learning designs in the style of the YouTube video sharing "embed" feature. This feature allowed a learning design shared through the LAMS Community to be embedded into any other webpage showing a picture of the authored design, together with links to preview a student view of the design and to open the design into the LessonLAMS website for exploration, editing and/or implementation. The embed approach meant that a LAMS learning design could be shared through any website, blog, etc, and this could be used as a basis for community discussion of templates representing difference teaching strategy, such as via the Cloudworks website (Galley, Conole, Dalziel & Ghiglione, 2011). The embed feature was subsequently used for sharing of project templates, such as on the website listed above, and on the medical project website (listed below – and see also Dalziel & Dalziel, 2010).

Medical education ALTC project

The core focus of the second project was the development of e-learning modules about the scientific basis of medicine ("Scientific Streams") for students in their third to fifth years of a new undergraduate medical degree at the University of Western Sydney (UWS). These students spend most of their time off campus in a range of clinical placements, so e-learning provided a way of supporting ongoing scientific training without removing students from local clinical experiences. In addition, students were presented with a range of different topics each year, which allowed students to focus on particular topics when they were relevant to their current clinical experiences (e.g., a student could complete the Oncology e-learning module while working in a cancer ward – some students would have access to this ward early in the year, whereas others may not access it until later in the year).

One of the goals of the project from a Learning Design perspective was to explore how learning design templates could assist in the development of the e-learning modules. Medical experts were shown an initial template based on a Problem Based Learning (PBL)

teaching strategy to assist with development, but in subsequent content development they created their own learning designs from scratch. Anecdotally some medical experts mentioned that the ideas from the template had inspired their own development, but they had not used the template directly. This indirect use of templates for "inspiration", rather than direct use via editing, has been previously observed in experiences from the LAMS Community (Dalziel, 2007). Further details of the process of Scientific Streams e-learning module development are described in Dalziel, Mason and Dalziel (2009).

As the project progressed, it became clear that many e-learning modules where using a kind of higher level conceptual template to inform the structure of specific modules. This template did not exist at the level of a directly re-usable LAMS learning design, but rather at a more abstract level, based on PBL- style ideas of teaching the scientific basis of medicine, but made concrete as a set of steps of starting with a clinical case study approach followed by more specific scientific knowledge and its application to clinical settings. This led to the development of the "eStoryboard", a paper-based framework used for analysing each e-learning module to determine gaps or areas for improvement (Dalziel, Mason and Dalziel, 2009). The eStoryboard sits somewhere between a teaching strategy and a learning design template – it provides more granular detail about the implementation of PBL than would be anticipated from any general description of PBL as a teaching strategy, and yet it was more generalised than a single PBL learning design template, in that there were many variations in the way learning activities were implemented across modules, even though they shared some broad similarities. The eStoryboard was well received by medical experts, particularly in its role supporting revision of content after its first year of use with students, and also in its role as a documentation process for industry quality review processes.

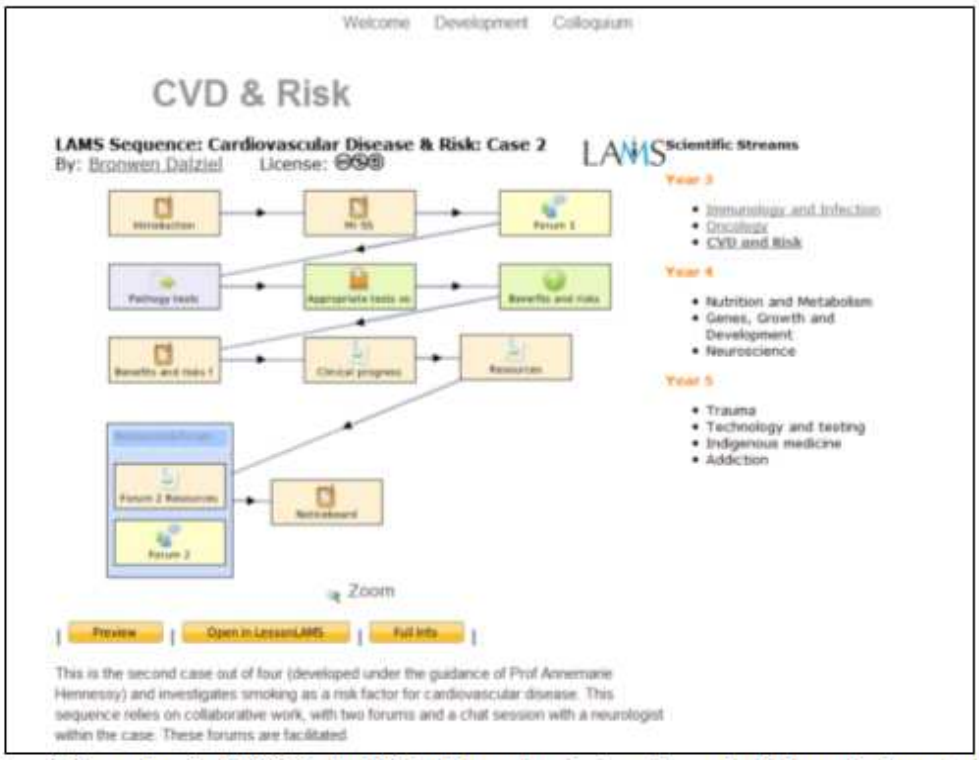

Figure 3: Example of a UWS Medical School learning design with embedded medical content.

One of its most useful features was to help medical experts better align their learning outcomes with the specific learning activities used in the e-learning modules. An example of an extract from an eStoryboard is provided in Figure 4 where the "Concept Check" (in yellow) is advice to medical experts to ensure their activity has achieved their desired learning goal, together with feedback to support experts in decisions about activities (in green) – the current learning activity is in the white box.

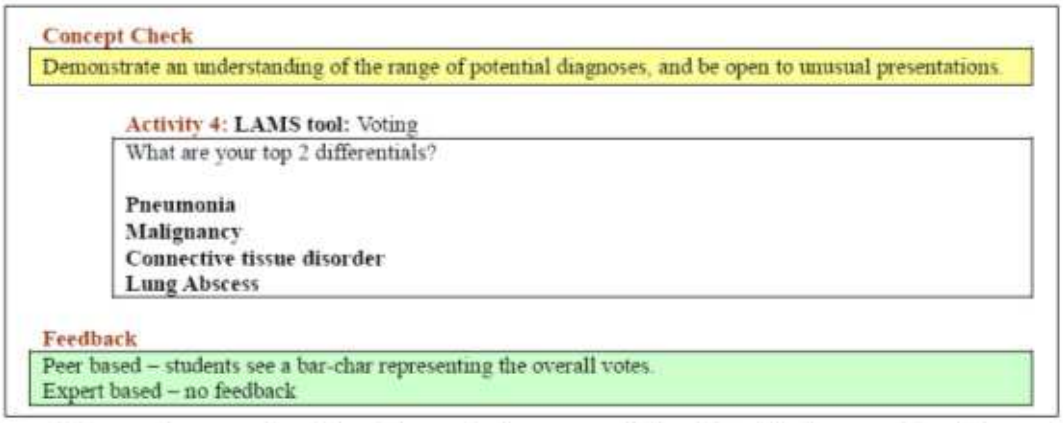

Figure 4: Extract from an eStoryboard for analysing a step within a Scientific Streams eLearning module

The key learning design output of the project was a suite of e-learning modules with embedded medical science content, shared as learning designs using the "embed" feature noted above (Dalziel & Dalziel, 2010). These designs are available in the "Development" section of the project website at http://www.melcoe.mq.edu.au/altcmedical/

Reflections

It is interesting to note the ongoing tension within practical adoption of learning design approaches between generic templates and discipline content designs. As the behaviour of the medical experts illustrated, content-based designs were more motivating than content-free templates, and yet underlying the specific medical designs built "from scratch" was a kind of "meta-template" or higher order conceptual design that was informing the decisions of medical experts about the selection and ordering of learning activities. The representation of this higher order design in the form of the eStoryboard was perceived as a useful contribution to the overall development process, despite the lack of direct use of the original PBL learning design template. The eStoryboard also provided quality control throughout the project, ensuring that learning activities were aligned to the learning outcomes stated at the start of each module, as well as allowing future iterations of the content to fill knowledge gaps that were identified in the students work (following the first year of implementation).

In the case of teacher education, there was more willingness among educators to explore generic designs – most likely due to the explicit focus on learning about pedagogy within this discipline. However, the way that templates were presented had a significant impact on the willingness of educators to explore them further – educators did not wish to see many variations of a single teaching strategy – rather they preferred a minimal example in order to understand the essence of the new teaching idea. And despite the interest in templates, the educators still wished to see a "worked example" including embedded discipline content to accompany the generic version of the template, as the worked example provided a concrete illustration of the teaching strategy which appeared to help educators better generalise to their own discipline interests at a later stage. For accompanying pedagogical advice, there was a preference for brief advice followed by a rapid move to "hands-on" exploration of the templates, rather than detailed "up front" pedagogical advice.

This last point presents an important ongoing challenge for the field of learning design. On the one hand, it is hoped that educators will explore and implement new teaching strategies so as to foster innovation in teaching and, ultimately, improved student learning

outcomes. However, educators need to understand the wider pedagogical theories that underlie new teaching strategies in order to best adapt these strategies to their own local context – and yet there is only a modest willingness to read about these theories in the online environments explored in this project. Further research is needed to determine the ideal modes of presentation of this wider pedagogical background, including the timing of presentation within a cycle of innovation in teaching. It may be that in some contexts, the optimal time for deeper appreciation of the pedagogical background to a teaching strategy is immediately after its first implementation with students, when the experience of adapting the template and its impact on students is fresh in the mind of the educator.

Another dimension of this problem may be related to a mismatch of the online context of use and the requirements for deeper reflection. One possibility is to provide this wider pedagogical advice away from the computer, such as in the form of a short book chapter. This would allow the educator to reflect at more length on the pedagogical ideas without the constraints (and distractions) of the hands-on online environment. A recent attempt at implementing this approach (separate from the above projects) has been tried in the book "Practical eTeaching Strategies" (Dalziel, 2010) – but further research on this and other approaches is required in order to determine the optimal modes for providing a wider pedagogical background for new teaching strategies to accompany practical implementation of learning design templates.

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