Using a template for LAMS in a medical setting

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Using LAMS to create 250 hours of online content for a medical school has allowed for much reflection on the use of templates and Learning Design. Whilst a LAMS template was initially thought to provide the best pedagogical guidance necessary for the clinicians designing content, it was soon found to be too restrictive for the different ways of teaching the medical topics. The first 75 hours of content (13 case studies) were created with a wide range of teaching styles, and with little reference to the details of the original LAMS template. Analysis of common themes in the case studies showed that a higher and looser level of structure could be applied to all of the sequences as three broad themes: the clinical case; the scientific basis of the disease; and current research or ethical considerations around the topic. Concurrent with these themes was the application of three pedagogical categories that ensured each Learning Objective was adequately taught: the teaching and learning point; a concept check; and feedback. This structure was used in the creation of an eStoryboard for each case study and has been used for retrospective analysis of cases for pedagogical soundness and for planning of future content in the course.

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Using a template in a Medical Education setting

In 2007, the School of Medicine at the University of Western Sydney (UWS), decided to use LAMS in the creation and delivery of approximately 250 hours of Scientific Basis of Medicine course work (called Scientific Streams) for their Years 3 to 5 curriculum as described previously (Dalziel, 2007a). In order to facilitate the creation of the content, where lots of clinicians who have little knowledge of E-Learning or how to use LAMS are involved, it could be very helpful to have a template that provides a variety of activity structures that can be populated with resources. In our context, a template was a set of LAMS tools (or activities) ordered into a sequence deemed suitable for learning through medical case studies, which were empty of content. The tools had some editing advice attached to them to guide the clinicians through their use. We thought the template would help the clinicians to focus on what they knew best (the clinical and scientific aspects of different diseases) without worrying about Learning Design or even the simple question of what LAMS tools they could use. It was hoped that using the template would make modules of a consistent quality and that using templates represented best practice for Learning Design, as reviewed below.

Review of Learning Design and Templates

One of the key goals of Learning Design is to convey good pedagogical practices to educators through the provision and adoption of effective templates. A template should provide a sequence of predefined activities that guide the teacher through a lesson plan such as a "role play" or "discussion activity" but will also allow the teacher the autonomy to adapt the template which he or she wishes to use. There have been different approaches to Learning Design template creation and dissemination, and various results from practical projects in this area.

Educational Modelling Language (Koper, 2001) and the IMS Learning Design specification (IMS, 2003) were early attempts at a machine-readable language for representing many different pedagogical approaches, and these languages could be used to describe effective teaching templates for adoption by

others (such as the Versailles Role Play in the IMS Learning Design Best Practice Guide). LAMS was one of the first systems to implement re-usable pedagogical templates, inspired by IMS Learning Design (Dalziel, 2003). Other less technically oriented early approaches to describing and sharing effective Learning Design templates include the AUTC Learning Design project (Agostinho *et al.*, 2002), the work of Diana Laurillard and colleagues on the SoURCE project and at the UK Open University (Laurillard and McAndrew, 2003), and work on educational patterns (eg, McAndrew, Goodyear & Dalziel, 2006).

Subsequent work on Learning Design among LAMS users has included the sharing of over 400 community-generated designs (as at April 2009) via the LAMS Community (Dalziel, 2009), as well as various specific attempts at different kinds of templates and advice, such as:

- Creation of a standardised teacher's guide template (see the Teacher's Guide accompanying a Global Warming sequence, Dalziel, 2006);
- Creation of "blank" sequences with accompanying pedagogical advice/patterns (see "Planning collaboration using the 'One minute papers' method within LAMS" and similar sequences in the LAMS Community by Kordaki & Seimpos, 2009)
- Adaption of an existing introductory psychology sequence into a generic introductory subject template (Dalziel, 2005)
- Recent development of a pedagogic/activity planner to accompany LAMS (eg, Cameron, 2009)

Apart from direct use of templates, Dalziel (2007b) notes that feedback from LAMS Community users has indicated that many educators have adapted ideas found in other sequences when designing their own sequences – in these cases, the nature of re-use is "inspirational" rather than direct.

While there have been a range of successful projects on the creation of Learning Design templates, less is known about how they are adopted and re-used by other educators. Downes (2003) has argued that because teaching is always highly contextual, re-usable designs are unlikely to be successful, and instead proposes the idea of "disposable" designs – those that are easily created and discarded after use, rather than templates that require extensive experience. This idea may relate to the observation from the LAMS Community of users being "inspired" by good ideas from others when building their own sequences, but not adapting existing sequences directly.

A different observation from practical implementation arises from recent UK Open University work on recording and sharing Learning Designs using the "Compendium" tool (Conole, 2009), where designs may include annotations on "pedagogical" intentions which sit at a layer above that of individual tool choices, but below that of the whole design. For example, a Problem Based Learning design might have an initial "Problem statement" section, followed by an "Interrogation" section, then a "Research" section, then a "Discussion and Further Interrogation" section , followed by a final "Solution" section. Each of these sections has a particular pedagogical role in the overall design, including different advice to educators relating to the creation of each section, but the intent of each section could be achieved using a range of different tools – that is, there is no simple mapping of pedagogical intent to a specific learning tool.

Learning Design is still in the early stages of being adopted in medical education, but Ellaway, Dalziel & Dalziel (2008) have noted the significant promise of Learning Design and templates, particularly for problem based learning, patient case studies, and use with students on clinical rotations (Cameron, Dalziel & Dalziel, 2008).

Implementing the first template

As detailed in Dalziel (2007a), the first template that was designed used a Problem Based Learning (PBL) style that reflects current best practice in medical education (Neville and Norman, 2007) and compliments the extensive use of PBL in the first two years of the course. The template and LAMS software were presented at an internal conference to the clinicians in mid 2007 (see Figure 1), and a MS Word document was generated and distributed, which outlined the different steps in the template. The template was uploaded into all LAMS authoring accounts to make it easy to open and use.
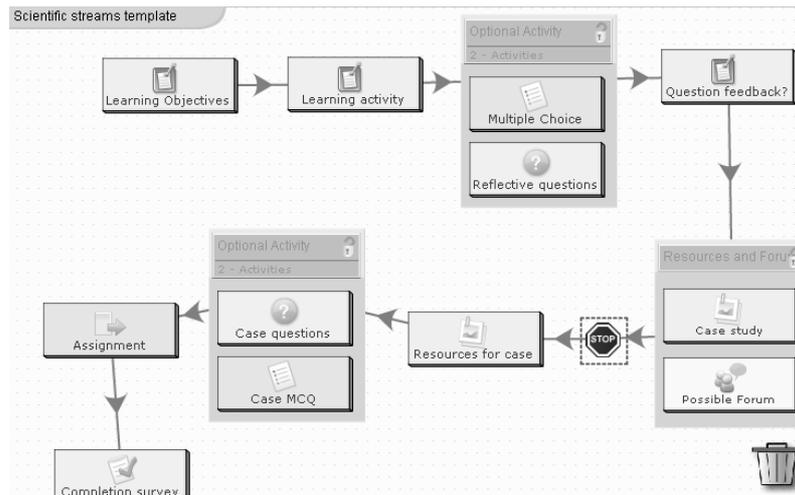
Fig 1: Original LAMS template given to clinicians in October 2007

However, not one clinician chose to use the template, most preferring to use the blank Authoring space to start their modules or else used MS Word to write down a case scenario with accompanying questions and resources. Their content was influenced to some extent by the template, with all content being presented in a PBL style: that is, a case study followed by hypotheses generation, scientific resources and questions and diagnosis of the case, although it can be argued that this style comes most naturally for an educator in a clinical setting.

Comparison of template to finished sequences

Once the first 75 hours of content (consisting of 13 case studies) had been developed and presented to students at the start of the year, we investigated differences between the original template and the actual sequences being used. We found that the sequences were far more complicated and varied than the original template had envisaged. Whereas the template had around twelve activities suggested, the created sequences had between 15 to 38 separate activities. Content experts were observed to have quite different teaching styles and strong personal views on how the students should learn, and felt constrained by any mention of fitting into a 'template'. For example, one case study included 3 separate facilitated forums with a total of 15 forum topics (see Figure 2) whereas another content expert wanted to avoid facilitated activities or marking submissions and preferred to rely a more didactic approach to teaching (see Figure 3). This observation supports Downes (2003) argument that teaching is too contextual for direct reuse of templates.
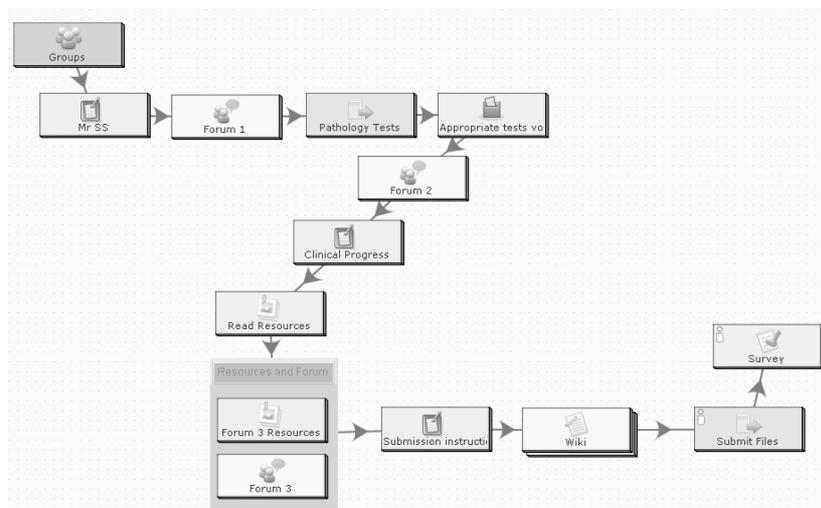

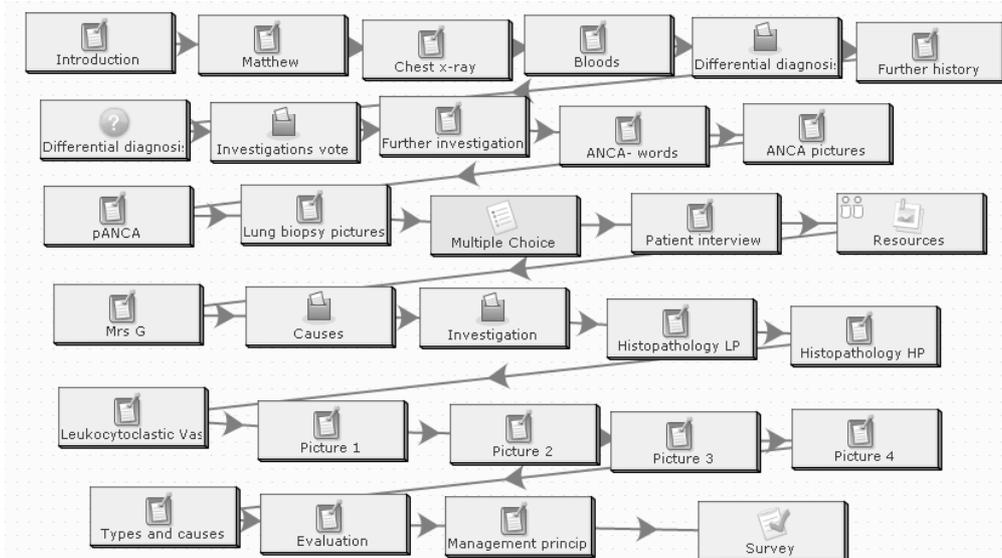**Figure 2: Sequence containing highly collaborative activities**

Figure 3: Sequence containing minimal collaboration

Guiding the next round of content experts

Work has now commenced on the next 75 hours of content, which will be made available to students next year (2010). Whilst we had learned the lesson that a detailed template in the form of a blank LAMS sequence was not appropriate in our setting, content experts were still asking for some guidance as to how to approach the Scientific Streams. In addition to that, we needed a way to review the learning design in the sequences from 2009 and record what we had put into LAMS as part of academic course guidelines. In order to do this, we decided to use a word processing document to both create an e-storyboard of completed content, and to act as a blank guide for new content. This had several advantages in our situation. Firstly the content is being generated by teams and we do not need to train all content experts in how to use LAMS yet they all have sufficient word processing skills. Secondly, the new teams tended to be larger (between four to six people could be working on any one case at a time) which made it harder to regulate who was doing what in the LAMS authoring environment. Finally, a record of our content and the resources used to create the Scientific Streams are documented and can be archived for future accreditation processes.

The actual e-storyboard/template is a much looser structure than what is normally created in a LAMS authoring environment, but still rests on solid pedagogical structures. The template is divided into three broad and sequential categories:

- The clinical case or trigger
- The scientific basis for the disease presented in the case
- Evidence based medicine for treatment and/or ethical considerations around the topic

Using a real case example (provided in appendix) a sequence would look like this:

- A baby is brought into hospital suffering seizures. Doctors discover very low calcium and Vitamin D levels from a blood test.
- Students learn about Vitamin D in calcium and bone metabolism. Students look at the epidemiology of Vitamin D deficiency in the Australian population. Students learn about Vitamin D metabolism in other body systems.
- Students debate the merits of sun awareness campaigns versus the need for sunlight in order for the body to create Vitamin D. Students create a pamphlet or video which provides information about Vitamin D to certain target populations (e.g. heavily veiled Muslim women)

Using this design approach, it was easy for the clinical team to break down the case into areas of expertise and make sure that it was well balanced with both clinical and scientific aspects. The team brought in a number of useful resources which could fit into these categories and which allowed for a quick creation of a LAMS sequence of resources and activities in a logical flow.

The e-storyboards also have a second level of structure, which we designed to ensure each learning objective was supported by good pedagogical practice. Each learning objective or 'teaching and learning point' is divided into three sections:

- The introduction to the teaching and learning point. This can range from a short paragraph to extensive resources for the students to view on a particular topic.
- A concept check. This involves active learning around the learning objective
- Feedback. This ensures that the students have appropriate feedback on their activities, either as an 'expert opinion' model answer, a facilitator in a forum or peer feedback.

Using the previous case as an example again, we can look at the learning objective "Students will be able to demonstrate an appreciation of the influence of cultural norms and practices on the risk of disease, through influence on diet, lifestyle and behaviour":

- Teaching and learning point - Activity 1: Students are introduced to skin cancer campaign material and advice about time needed in sun to gain recommended Vitamin D levels.
- Concept check – Activities 2 and 3: Students debate the merits of both points of view in a forum. They then create a pamphlet or video speech providing information to the public about Vitamin D
- Feedback: The forum provides peer feedback. The pamphlet/video will be assessed for accuracy of content and clarity by both the students and an expert (Endocrinologist).

In the example above, it can be seen how a learning objective was broken down into the three sections to provide a comprehensive look at skin cancer awareness and adequate exposure to sunlight for Vitamin D generation. What we have found most striking about using this method to structure a learning objective is in a retrospective setting, where we can look at previous LAMS sequences and check for parts where one of the categories is missing. For example, in one of the case studies, the author often gave no expert feedback. For example:

Concept Check

Demonstrate an understanding of the range of potential diagnoses, and be open to unusual presentations.

Activity 4: LAMS tool: Voting

What are your top 2 differentials?

Pneumonia
Malignancy
Connective tissue disorder
Lung Abscess

Feedback

Peer based – students see a bar-char representing the overall votes.
Expert based – no feedback

Other problems included topics not being introduced adequately so students did not understand their relevance (observation supported by comments in student feedback at end of each case) as well as some learning objectives set out at the beginning of the lesson did not align with any of the teaching and learning points or concept checks. We can now take these documents along with student feedback to the content experts and have compelling evidence as to why they should re-examine the LAMS sequences; and provide resources, questions or feedback where necessary – see appendix for example eStoryboard.

The eStoryBoards have helped to serve two important purposes in the context of a medical setting. Firstly they have ensured good design of content both retrospectively and in the planning of future content. Secondly, they have provided the necessary documentation of the pedagogical processes and content presented to the students, which can be used as material for accreditation of the course (all medical courses in Australia must be accredited by the Australian Medical Council). We have found an approach similar to the ideas behind the UK Open Unversity's "Compendium" (Conole, 2009) tool to be a much better fit with our needs than a detailed LAMS sequence as a template, which restricts the creativity of our content experts. However, we do think in a different context that a LAMS template has a place for a seasoned LAMS user, who will happily pull apart a LAMS sequence and add or delete from it, using it as an inspiration and a guide.

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