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# **A new methodology for learning design**

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## **Abstract**

This paper describes the development of a new methodology for learning design. Our approach is predicated on the view that no one, simple, view of design is appropriate, because of the inherently messy and creative nature of design. Instead we are adopting an interactive and multi-faceted approach which consists of a series of cycles of user consultation, focus groups and workshops alongside the development of learning design tools and resources. In particular we will describe how we have adapted an existing mind mapping and argumentation tool, Compendium, so that it can be used as a means of guiding designers through the learning design decision making process in the creation of learning activities. We will describe the initial evaluations of the use of this tool, along with our findings to date on a series of fact finding exercises to better understand individual and team approaches to design.

## **Introduction**

Technologies continue to develop at a phenomenal rate, whilst this has tremendous potential in terms of their use to support learning, it also increases the complexity of the decisions and factors designers need to take account of in order to make use of the affordances of new technologies. There has been a shift in recent years, in research and development activities concerned with the use of technologies for educational purposes; from a focus on the creation of content ('learning objects') to the recognition of the importance of 'learning activities' and hence a focus on learning design (Beetham and Sharpe, 2007, Lockyer et al., 2008). This paper will describe work to date on the development of a Learning Design methodology. This work is cognisant of the fact that design is a complex and multi-faceted process and hence any approach which attempts to provide some support for the design process needs to be aware of and take account of these facts. The work is being carried out as part of an institution-wide project at the Open University in the UK. The Open University is a large-scale distance education provider with over 200,000 students. It has a well established educational model (Supported Open Learning) (Jones and Conole, forthcoming) based on a two-stage design cycle of team-based production followed by a delivery ('presentation') model using distributed associated lectures who provide the support and feedback to students who work through the carefully crafted pedagogical content and activities designed by the course team. The university has also invested over £5 m in the last two years in the implementation of a Virtual Learning Environment (Sclater, forthcoming), not surprisingly such a large-scale change programme has unearthed a range of institutional issues (in terms of appropriate pedagogical models, staff and student ICT skills and institutional support mechanisms and processes) (Jones, forthcoming). In parallel the university has been engaged with a \$10 m project, funded by the Hewlett foundation, which is developing free open educational resources, as part of the OpenLearn project (McAndrew, 2006). Naturally this raises a related, but slightly different set of pedagogical, technical and organisational issues. What these large-scale initiatives serve to indicate is that with the advent of new technologies and potential new models of design and delivery, the OU faces a set of challenges for how it can best support its staff in making the most of the potential affordances technologies and new pedagogical models offer.

## **The OU learning design methodology**

We contend that the approach we are adopting offers an innovative and holistic approach to instigating learning design. Rather than focusing on specific staff development activities or the development of a 'learning design tool' we are adopting a multifaceted approach matching evolving user needs with an appropriate set of tools and resources. As we have argued previously (Conole et al., 2007, Conole, 2008a), we see this as important as design is a complex process:

Design is a core part of any teaching or training role; i.e. how concepts can be presented to students to enable them to achieve a set of required learning outcomes. Educational text books might give the impression that there is a simple linear basis to the design process; starting with a set of learning outcomes, based on a particular pedagogical approach, appropriate resources, tools and activities are identified and linked together, assessment acting as the ultimate arbitrator in terms of success or failure. However in reality the design process is rarely so simple. [Conole, 2008a]

Studies in the literature (see for example Beetham and Sharpe, 2007; Lockyer et al. 2008) and our initial work, have indicated that there are two main ways in which designers and teachers go about getting ideas and creating new learning activities – through existing examples and case studies (either through individual stories or via repositories) or through some form of guided support, which scaffolds the design process (via an instructional designer/learning technologies acting in a brokerage role, through some form of staff development or workshop activities or through an interactive online learning design tool). But both approaches are not simple. Falconer et al. (2007) found that there is no simple shared representation of practice. Despite the plethora of repositories of good practice<sup>1</sup> and the growing number of learning design tools,<sup>2</sup> these appear to have little real impact on practice and it is questionable to what extent there has been a significant increase in the use of such resources and tools to create innovative learning activities.

Our work focuses on two main overarching research questions:

1. How can we gather and represent practice (and in particular innovative practice) (**capture and represent practice**)?
2. How can we provide 'scaffolds' or support for staff in creating learning activities which draw on good practice, making effective use of tools and pedagogies (**support learning design**)?

A key aspiration is to provide effective support for learning design, which enhances the quality, efficiency and innovation of learning activities created and which encourages designers/teachers to included creative and pedagogical effective ways of using new technologies. Our methodology is also about developing a shared vocabulary, which can be used as a basic for communicating and sharing understanding amongst designers/teachers and between designers/teachers and others involved in the learning development and support process. We have identified seven 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 facilitates reflection by the designer, by making the process more explicit
5. It creates an audit trail of academic design decisions.
6. It can highlight policy implications for staff development, resource allocation, quality, *etc.*

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<sup>1</sup> For example: the OTIS repository of case studies (<http://otis.scotcit.ac.uk/>), the e-learning centre library of case studies (<http://www.e-learningcentre.co.uk/eclipse/Resources/casestudies.htm>), the series of effective practice guides and case studies produced by JISC which synthesise key features across their development programmes ([http://www.jisc.ac.uk/whatwedo/programmes/elearning\\_pedagogy/elp\\_practice.aspx](http://www.jisc.ac.uk/whatwedo/programmes/elearning_pedagogy/elp_practice.aspx)), the AUTC learning design website ([http://www.jisc.ac.uk/whatwedo/programmes/elearning\\_pedagogy/elp\\_practice.aspx](http://www.jisc.ac.uk/whatwedo/programmes/elearning_pedagogy/elp_practice.aspx)), the MERLOT database of resources and associated support (<http://www.merlot.org>) and the GLOBE learning object brokered exchange, <http://globe.edna.edu.au/globe/go>

<sup>2</sup> For example: Dialogplus <sup>2</sup> <http://www.nettle.soton.ac.uk/toolkit/>, LAMS [www.lamsinternational.com](http://www.lamsinternational.com), the Phoebe Learning Design wiki <http://phoebe-project.conted.ox.ac.uk/cgi-bin/trac.cgi>, and the London Pedagogical Planner <http://www.wle.org.uk/d41/>

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

By learning design methodology we mean a set of processes and practices, derived from empirical evidence, which can be used to facilitate and support the design of learning activities. Our approach to the development of a learning design methodology is characterised by four overarching principles:

1. Articulation of a formal means of describing activities
2. Facilitation of the reuse of learning activities
3. Identification of appropriate scaffolds to support the design process and mechanisms for deploying these through appropriate channels (which might include staff development guidelines, LD workshops or integrated help within an adaptive LD tool)
4. Development of a shared language and set of representations for learning activities so that individuals or small teams can discuss and share ideas or interrogate repositories of good practice and case studies.

To achieve this we are adopting an interactive two-part approach:

1. Gathering of user requirements, understanding of the design process and mapping of the design process
  - a. Phase 1 – user consultation and case studies
  - b. Phase 2 – interviews and focus groups/workshops
2. Tool and resource development
  - a. Phase 1 – initial adaptation of the Compendium tool for LD, faculty workshops
  - b. Phase 2 – refinement of CompendiumLD

## **Progress**

This section will provide a summary of progress to date, concentrating in particular on the more recent work under phase 2, on the development of CompendiumLD and findings from the interviews and workshops.

### *Phase one*

During phase one the OU Learning Design linked in with two existing pieces of work. The first was institution wide user consultation on learning design requirements. This consultation demonstrated that eliciting requirements for learning design was far from simple. Asked what an individual might want in terms of functionality for a new calendar system is one thing, asking them what they might want out of a tool for design is much more challenging, particularly as an understanding of design and adoption of a learning design mindset is not common. Our empirical research and the work of others indicates that traditionally learning design is primarily tacit, embedded in local practice and subject cultures. It also highlighted a range of perceived barriers and enablers to adopting a learning design approach and to more effective use of technologies to support learning. From this a series of overarching factors emerged; designers and teachers wanted:

- Discipline specific case studies illustrating how others use technologies.
- Information about the tools available within the new VLE and how they could be used, along with ideas on innovative learning activities students could undertake using these tools.
- Step-by-step guidance through the process of creating learning activities.
- Pointers to further resources and named contacts within the institution
- Support and guidance on how to repurpose existing materials as Open Educational Resources.

The second area of activity in phase one was collection of 43 learning activity case studies from across the university captured through in-depth interviews with course leaders (Wilson, 2007). The focus was on the pedagogies used to achieve specific learning outcomes and the use of tools (blogs, wikis, e-assessment, *etc.*) to support learning activities. Interviews were semi-structured around four core themes: contextual data (level, subject, *etc.*), details about the learning activity being described and the sub-tasks involved, pedagogical approaches adopted, and barriers and enablers to the creation of the activity (both technical and organisational). Each interview lasted *ca.* one hour and was recorded and transcribed. Following this, the text was edited in to a standard template form and a diagrammatic representation of the learning activity

drawn. This content was checked for accuracy with the interviewee. The case studies highlighted a range of overarching themes:

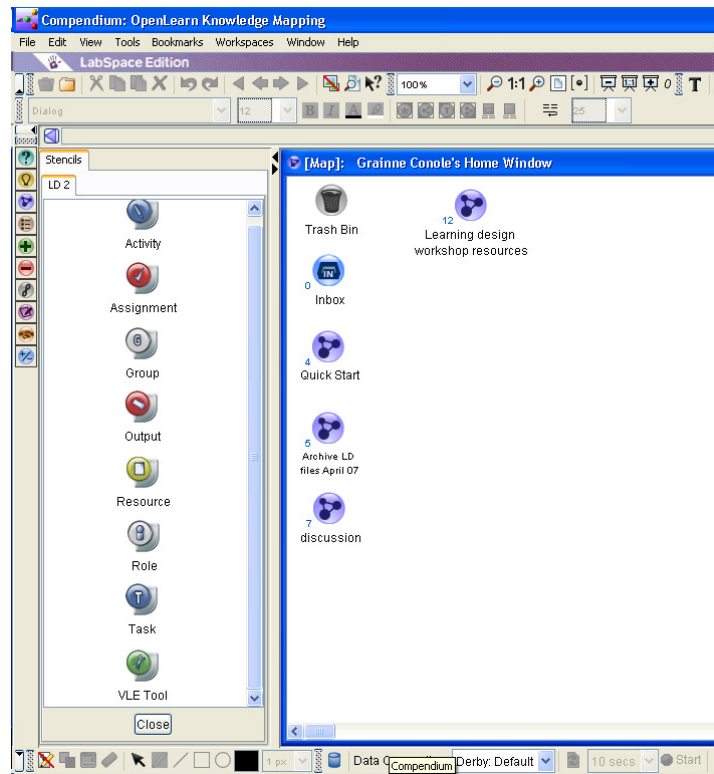
- Designers/teacher relied extensively on their prior experience and local context for development
- Uncertainty associated with the constantly changing functionality offered by available technologies
- The willingness, access and ability to facilitate the transfer of good practice varied considerably'
- Existing online learning design resources (case studies, theoretical frameworks, toolkits) were used very little
- The design process is messy, creative and iterative
- Existing institutional systems did not adequately reflect new ways of working and effective use of new approaches and technologies
- The changing nature of the student and academic roles and associated skills set.
- Role of motivated individuals in driving forward innovative practice
- Increasing provision of online activities and materials compounds the sense of fluidity and the expectation for more frequent re-design
- Issues emerged about the balance of resources and activities associated with the OU's SOL two-stage process of production and presentation.

Informed by these findings we developed a series of learning design workshops. These included a general introduction to the concept of learning design and its benefits, along with exercises for participants to rethink their approaches to creating learning activities. It also introduced them to a range of existing tools and resources for learning design. In addition we introduced them to Compendium as a tool for thinking through, conceptualising and sharing their representations and design decision-making process. We choose Compendium as a design tools for a number of reasons. A review of existing learning design tools, indicated that whilst each had particular merits, none addressed our central philosophical principle that support for the design process needs to recognise the creative and messy nature of design and therefore needed to support and augment the design process that rather than straight-jacket. Compendium was an existing tool for mindmapping and the development of shared argumentation, developed in-house by our Knowledge Media Institute in association with Verizon.<sup>3</sup> It was easy to use, had good support documentation, appeared to be flexible in how it could be used, and crucially it appeared to be relatively easy to adapt to accommodate learning design specific aspects.

Figure 1 provides a screenshot of Compendium, showing the generic set of icons on the far left-hand side, along with our initial learning design stencil set 'LD2' and a sample learning activity map in the main window. 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 image files, 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 web pages.

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<sup>3</sup> See <http://www.compendiuminstitute.org/> for further details



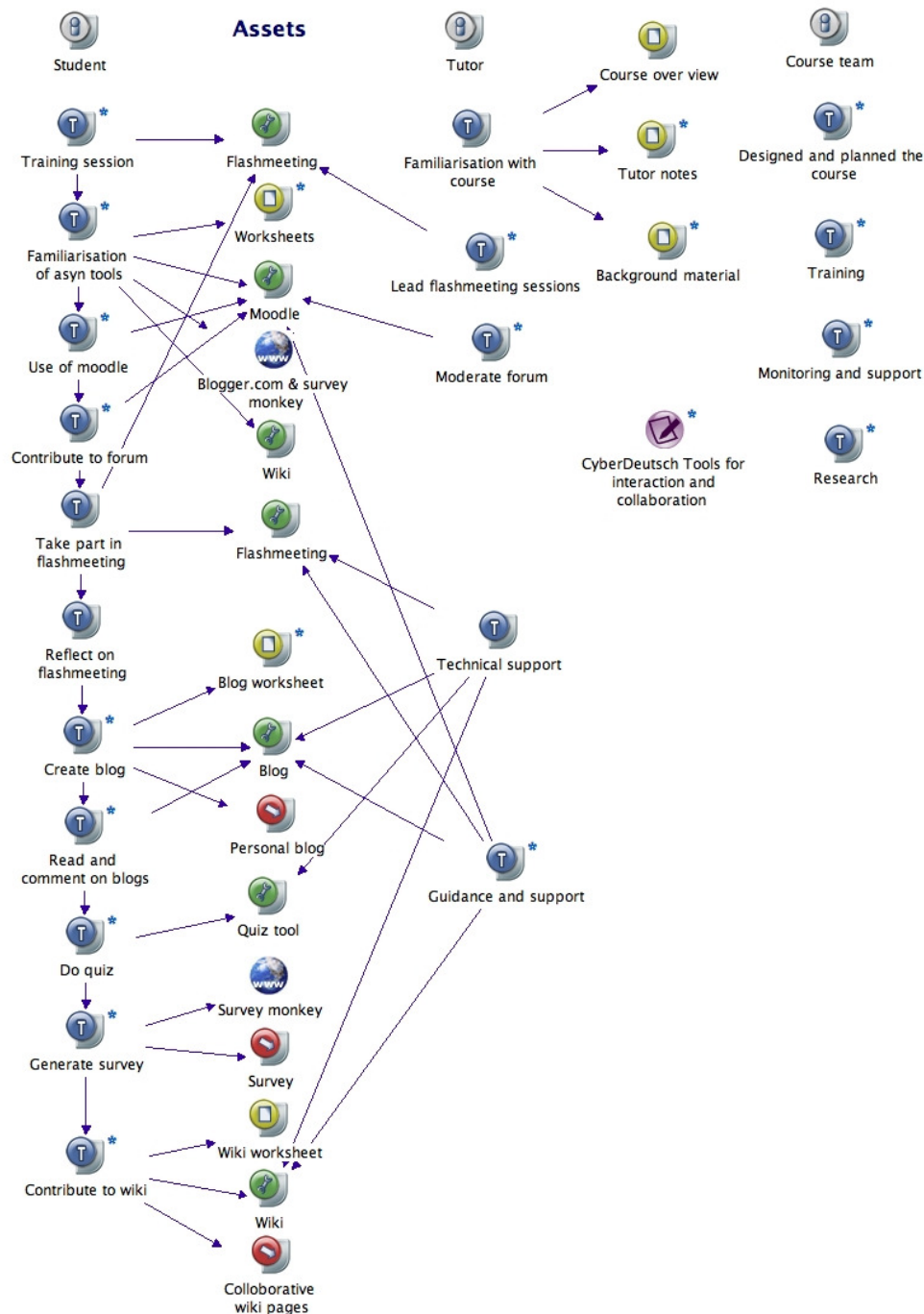
**Figure 1: Screenshot of Compendium with the LD2 learning design stencil set of icons**

The dedicated set of learning design icons, complement the generic set available within the tool. 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. These were derived from a more detailed taxonomy for learning activities (Conole, 2007). All of the learning design icons are of the same underlying Compendium node type, except for the activity icon, which is a variant of the generic map type. A core functionality of Compendium allows users to create, name and incorporate new sets of icons, called 'stencils', in to the list of available stencils (opened via the tool menu). As with the core Compendium icon stencil set, when dragged in to the map window, users are able to re-label the caption text beneath the icons to something more appropriate and descriptive to their context.

Eight faculty-based OU workshops were run using the improved learning design-focused Compendium tool and associated resources. The workshops included an introduction to the concept of learning design and a series of exercises getting participants to reflect on their current strategies for design. The second part included a hands-on session where users worked in groups to present their own learning activities in Compendium. A comparable workshop was also run at the University of Porto. Additional feedback was obtained various members of the team working with individuals to map up interesting learning activities in Compendium and through presentations to and feedback from course teams. An example of a learning activity by Ursula Sticker and Regine Hempl mapped in Compendium based on some brainstorming ideas of how the Moodle VLE tools might be used for language learning is showed in Figure 2. What is interesting is the way in which the participants adapted the column-based role and asset structure we presented to suit their own needs; importantly the flexibility of compendium as a tool enabled them to do this and did not appear to unduly stifle their creativity. We were surprised at how far the participants got in representing their designs and it did seem that Compendium acted as a useful tool to help them articulate and share their thought processes. The overall findings were:

- It was easy to use and groups quickly generated activities
- Using tool in a group helped them reach consensus
- It enabled different granularities of use
- The process helped surface hither to hidden complexity

- The specialized learning design icon set worked well
- The process helped users understand different aspects of design
- It helped them development a different way of thinking, by focusing on activities rather than content.



**Figure 2: Brainstorming idea for using the Moodle VLE tools for language learning**

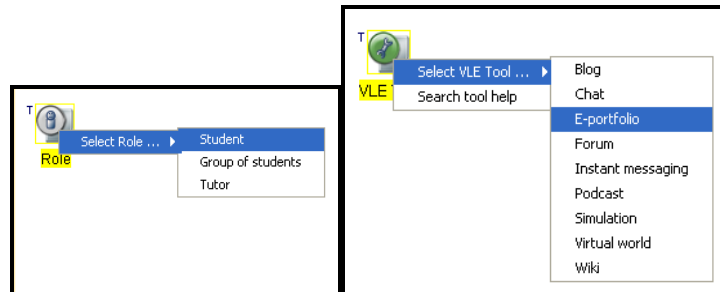
*Phase two*

We are currently in the middle of phase two of this work which, as described earlier, consists of a further round of fact finding exercises and evaluations, coupled with iterative further design of the CompendiumLD tool. The tool and resource development part is focusing on adapting Compendium to include tailored and contextual help at various points in the design process.

In addition to the stencil set, several other features have been added to the functionality of Compendium to create the CompendiumLD version. The stencil set (see figure 1) includes icons representing types such as activity, role, task, tool etc. In CompendiumLD the type of each node created by a designer using the LD-AB stencil set is registered by the application, which enables features to facilitate the design process, and to support in the design process. In terms of facilitation, CompendiumLD prompts the designer to select a sub-type for a role or VLE tool node as they drag and drop it onto an activity design. The sub-types available to be chosen for the tool nodes are

- blog, chat, e-portfolio, forum, instant messaging, podcast, simulation, virtual world, wiki
- student, group of students and tutor for a role node.

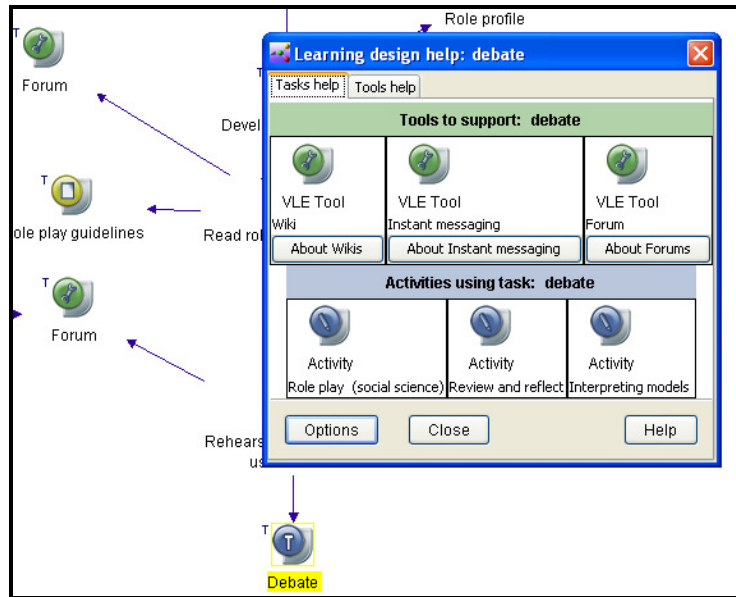
The menus, which appear as the designer drops a node into an activity, are shown in Figure 3.



**Figure 3: CompendiumLD's Tool and role selection menus**

In terms of support, CompendiumLD offers context-sensitive help to the designer. For example, as the designer types into a task description label, the words typed are scanned and help related to selected verbs (e.g. collaborate, consider, discuss, reflect etc.) pops up. An example of such a help window is shown in Figure 4. In this example, the designer has typed 'Debate' into the task label: this prompts the application to pop up a window showing tools to support debating and existing activities that include tasks which include the word 'debate'. The set of tools shown in this help window are selected using a verb-to-tool look-up table; the set of activities is generated by searching the database maintained by Compendium for activities including tasks with 'debate' in their label. Further help is provided by the 'About..' buttons'. These buttons initiate a customised Google search of selected web sites (<http://www.google.com/coop/cse?cx=000971387191123125524%3A1woruyth0qs>). The web sites were chosen because of the quantity and quality of the information they provide about use of tools in learning and include sites such as <http://www.learningdesigns.uow.edu.au/> and <http://www.educause.edu/>.





**Figure 4: CompendiumLD's task related help window**

In the fact finding and user requirements part of phase two we are conducting a further series of interviews, as well working alongside a number of course teams as they develop the course, to begin to track the design process over time. The focus is specifically on the design process rather than the nature of activities which was the focus of the first round of institutional case studies. We wanted to gather views on how people currently design their courses, what approaches, strategies and help they use. In addition we wanted to gather views on what additional support they would find helpful - in terms of support material, workshops or interactive design tools. Our semi-structured interviews are designed to ask a series of questions about learning design, both as an individual and collective process, and focus on five main areas: process, support, representation, barriers, and evaluation (Table 1).

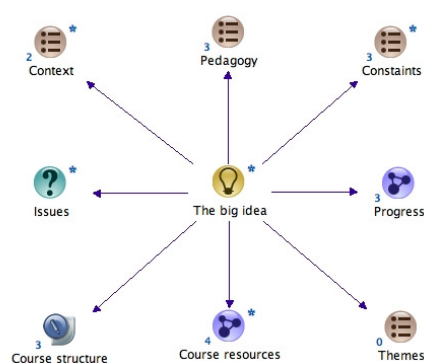
<b>Section A. Questioning about design of individual course components</b>	
1. Process	How do you go about developing/designing the parts of a course you are involved with? What factors do you consider when designing a section of the course/an activity? (Prompt: consideration of learning outcomes, content, tools, resources, and activities. If no mention of learning outcomes, ask how they you use then and if they use them in design?)
2. Support	How do you generate ideas for creating learning activities? (Prompt: e.g. Discussion with colleagues, prior experience, case studies, conference presentations? Mapping in with overall course design? External requirements? Do you use any external sources of help to help you develop your sections of the course/learning activities (Prompt: such as case studies, web sites technologies and how they can be used?)
3. Representation	How do you represent your designs/thought processes? (Prompt: in word, diagrammatically, etc. Any examples you can let us have?)
4. Barriers	What do you have most problems with when trying to design learning activities? (Prompts: ideas for structuring a learning activity, ways in which technologies might be used, mapping of tasks to outcomes, development of appropriate assessment? Also how do they deal with these?)
5. Evaluation	How and when do you evaluate the activity (prompt what criteria are used to deem it acceptable?)
<b>Section B. Questioning about design of the overall course</b>	
1. Process	1. Briefly describe the steps involved in how a course is designed. (Prompt: How do your ideas evolve from initial concept, to design, to final product? To what level of detail does the course team design the course? Do you design the entire course in detail or just the top level?)

	<p>2. What things drive the design process? (Prompt: The course timetable/calendar, learning outcomes, professional requirements, market demand, student feedback, etc.)</p> <p>3. As a course team, how do you sequence and balance different activities? (Prompt: How do you ensure there is an appropriate mix of types of activities, use of tools, etc.)</p> <p>4. How does the course team manage the design process, i.e. the development of the course content, structure and activities? (Prompts: Does content and activities change during production and how is this managed? When is design finished? Are design and production clearly defined and separate stages? Is there a transition/separation between design and authoring/production? How do you manage deviations from design during production? How do you fit in what you are doing within the overall course design/structure? How do you relate your individual content and activities to the overall content?)</p>
2&3. Support & Representation	How do you, as a team, generate ideas and share ideas and designs? [Prompt: How do you identify opportunities for using new technologies within a course or activity? How do you communicate with ALs?]
4. Barriers	What are the main problems in terms of design at the course level [Prompt: Institutional constraints, technology immaturity, etc.]
5. Evaluation	How do you evaluate your course design? (Prompt: i.e. the structure, content, proposed activities? How and when – during the process or post event during presentation - do you judge the quality of the activities you have designed?)

To complement the interviews, we also wanted to conduct more in-depth evaluations and therefore decided to follow a course team through a period of time in order to elicit how they design and the dynamics of the process. As part of this we have started working with a course team who are designing a new 60-point masters level course –with a current working title ‘Technology enhanced learning: practice and debates’. Initial work with this team is encouraging and we are gaining a lot of in-depth detail of the holistic nature of the design process, how it works across team members, over time and how it oscillates between different levels of granularity. A snap shot of the outcomes of an early brainstorm for the course illustrating the wide ranging and interconnected set of issues which were discussed is provided in Figure 5. We are currently exploring the possibility of working with a second course team, this time based in the Science faculty.

Finally we are planning to run a series of focus groups and workshops in early 2008. These will cover three main areas:

- Case studies and resources – comparison of different case studies asking what their values are and what they can be used for in terms of the process of creation and the description of the activity itself.
- Tools comparison – comparison between CompendiumLD+ and other current learning design tools including LAMS, the London Pedagogical Planner and Phoebe.
- Technology – a ‘thinktank’ style workshop bringing together a range of technology experts to consider the key issues and challenges we face in terms of learning design to consider possible technological solutions.



**Figure 5: Mind-map of issues raised in an early meeting of the Course. Created in Compendium**

## Conclusions

Work in this area is challenging and in our research field at the moment it is imperative to find a means of addressing our two overarching questions: 'How can we gather and represent practice' and 'How can we provide 'scaffolds' or support for staff in creating learning activities which draw on good practice, making effective use of tools and pedagogies (**support learning design**)? In this paper we have described the approach we are adopting, which we argue is pragmatic, grounded in the best in current research in learning design, and coupled with our knowledge and understanding of practitioner needs. We argue that a holistic and interactive approach provides a more realistic and feasible means of moving towards some means of providing a solution to these questions.

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