



## Supporting the design of online learning through use of learning designs

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The PhD study outlined in this poster addresses the need for more targeted development of university teacher's integration of digital technologies into the design of their courses in higher education. Technology use and integration in a rapidly changing environment poses a challenge for university teachers and the current use of technology in higher education falls short of expectations. It has been suggested that the problem is due to the separation of technology from both pedagogy and content knowledge (Mishra & Koehler, 2006). This study investigates the use of learning designs to support the process of designing units of study and the development of knowledge around that process. Using a multiple case study approach, the study focuses on deepening understandings of technological, pedagogical and content knowledge throughout the design process and the identification of methods to support university teachers.

Keywords: learning design, TPCK, case studies, technology integration, higher education, course design

### Background

Universities are under pressure to improve teaching and learning and therefore the design of effective online learning experiences has been a focus of government and universities in Australia (DEST, 2002) and abroad (Abrami et al., 2006). One limitation in understanding how university teachers design is the current lack of empirical literature in this area. As noted by Goodyear (2005), "we know very little about how teachers in higher education actually engage in design" (pp. 97-98). It has been argued that university teachers need guidance to develop high quality learning experiences (Agostinho, Harper, Oliver, Hedberg, & Wills, 2007). As McNaught (2003) observes, while general teaching and learning guidance is available from the literature and practice based texts, understanding of such information may be difficult for the those outside of the field of education. Booth & Anderberg (2005) provide evidence that university teachers had difficulty with the unfamiliar language of pedagogy. A further source of design knowledge and support can be found in centralised professional development and instructional design units. However, in the higher education context, funding and availability of time limits the extent of the support available to individuals leaving many individuals designing on their own with limited or no support.

The need for an understandable and effective method to learn about design and the integration of technology into teaching is evident. Learning designs which have grown out of case-based reasoning (Bennett et al., 2005) have been presented as a possible supports to the process of course design particularly within online environments (Bennett et al., 2005, p. 19; Dalziel, 2003; Oliver, 2007). As Daziel (2003), stated "Learning Design has the potential to revolutionise e-learning by capturing the "process" of education, rather than simply content"(p. 593).

### The study

The purpose of the study outlined in this poster is to investigate how learning designs could best support university teachers to not only integrate technology into their courses and learning activities but also develop their technological, pedagogical and content knowledge. Case studies which follow nine university lecturers' design processes will be used to investigate the following overarching question and four sub-questions:

How does designing a unit of study with the aid of a learning design lead to the development of more complex forms of knowledge about the integration of technology, content and pedagogy?

1. How does a learning design framework support the integration of content, pedagogy and technology within a unit of study?
2. How do learning designs influence university teachers' technological, pedagogical and content knowledge?
3. How do teachers use a learning design framework to support their design process?
4. What are the significant contextual factors that influence a university teacher's use of a learning design framework?

In order to address the research questions, this study will use a multiple case study design. The strength of a case study approach lies in answering "how" and "why" questions (Yin, 1994), enabling the investigation of processes (Merriam, 1988) and allowing the investigation phenomenon that are difficult to separate from context (Merriam, 1988; Yin, 1994). The investigation of multiple cases will provide broad evidence about the support which learning design models may provide from a number of disciplinary perspectives and under different sets of contextual influences (i.e. institutional factors).

The participants will be drawn from three broad discipline areas (humanities, sciences and the professions) within universities in ACT and NSW. During the study, each participant will chose a unit of study which they would like to design/redesign incorporating online components. After the initial meeting where the researcher will introduce learning design resources to the participant, the participant will choose a learning design to apply to their course and begin work on the design of their course.

Each case study will consist of data from interviews, unit of study documentation, the chosen learning design and visual representation of the lecturer's design at key points throughout the design and teaching phases of the unit of study. This data will be collected at multiple points throughout the process to follow the pre-design, design, teaching and reflection phases of the unit of study's design. The focus of the data collection at each stage will shift; however, in general the purpose will be to gain an understanding of how the participant designs and uses the learning designs in that process, the effects of institutional and disciplinary context and reflections on how the designs develop and change throughout the semester.

Building on work by Shulman (1986), Mishra and Koehler (2006) have developed a framework for looking at technology integration which suggests that it is necessary to have a good understanding of three areas of knowledge technological, pedagogical and content knowledge and their interrelationships in order to address the problem of poor technology integration. The Technological Pedagogical Content Knowledge (TPCK or TPaCK) framework will serve as a lens throughout the analysis.

The analysis of the data gathered will be conducted in iterative cycles following each phase of the design. The main methods of data analysis will be qualitative content analysis and qualitative coding of emergent themes. The qualitative content analysis will use codes drawn from the work of Koehler, Mishra & Yahya (2007). These codes along with data visualisation techniques will aid the researcher to map each of the knowledge areas (Technology, Pedagogy, Content, Technological Pedagogical, Technological Content, Pedagogical Content, and Technological Pedagogical Content Knowledge) throughout the design process and as represented within documentation and artefacts associated with this process.

The qualitative content analysis is expected to reveal the relative dimensions and frequency of each knowledge area and trace changes throughout the study. The interview and stimulated recall transcripts will undergo additional textual and qualitative analyses (assisted by Nvivo and Leximancer) to uncover emergent themes. This approach will help build a rich picture of the teacher's design process and how it changes and evolves. The final stage of analysis will involve a cross-case comparisons of the nine case studies. This analysis will be conducted to gain further insights into emerging patterns.

It is hoped that knowledge generated from this study will be of use to university teachers, professional development units, technology developers and policy makers in the higher education sector.

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**Please cite as:** Jones, J. (2008). Supporting the design of online learning through use of learning designs In *Hello! Where are you in the landscape of educational technology? Proceedings ascilite Melbourne 2008*. <http://www.ascilite.org.au/conferences/melbourne08/procs/jones-j-poster.pdf>

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