

Technology advances: Transforming university teaching through professional development

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Abstract: *Increasing use of information and communication technologies (ICTs) in universities is a global trend. However, many teaching academics are unfamiliar with the possibilities of ICTs and have limited understanding of how to integrate them into their teaching in pedagogically appropriate ways. This highlights a need for universities to provide professional development opportunities to assist staff to better understand their teaching practices, and the theoretical perspectives underpinning them, in order to exploit current educational technologies for the benefit of student learning. This paper introduces the broad trends influencing the advancement of technology in higher education before considering the opportunities that the new context offers for pushing the boundaries of theory and practice relating to learning and teaching in higher education. It then describes an online professional development initiative which responds to these opportunities. This is an exemplars website entitled Designing Electronic Learning and Teaching Approaches (DELTA) which has been introduced at Monash University to support pedagogically appropriate teaching with technology.*

Keywords: *e-learning, ICTs, pedagogy, professional development*

The new context

In recent times, issues and trends in higher education have been influenced by pressures from outside universities, including rapid and ongoing advances in information and communication technologies (ICTs). Attempting to identify the impact of technological changes, Collis and Moonen (2001) indicated four key trends in higher education: virtualisation, where people become comfortable using the internet for learning; lifelong learning, where people need new forms of learning experiences to keep up with the changes in their work contexts; personalisation, where the individual student's requirements are met; and globalisation/internationalisation, where operations extend beyond geographical and political

boundaries. Epper (2001) explained these trends in terms of: the rise of economic and social forces promoting the use of technology in all aspects of society; the need for more flexible approaches to teaching and learning; the new competitive landscape in higher education; and technology's potential to improve the quality of teaching and learning. Consequently, technology investment in higher education must be considered a strategic investment, not a cost.

Collis and Moonen (2001) warn that traditional universities will be left behind unless they change their learning and teaching approaches and keep pace with the developments of new technology. If technology-based flexible learning is to occur, there must be wider acceptance as well as actual use, moving from vision to practice. Collis and Moonen see this as a three step process: initiation of the change, scalability of the change beyond those immediately impacted by it, and institutionalisation of that change. Professional development is the key to facilitating these stages of change in university teaching.

Adapting teaching approaches to the new context

Ramsden (2003, p.13) comments that 'if we really want to improve the quality of higher education, the principles of effective teaching must also be applied to the task of ... educating lecturers.' In relation to the use of technology, 'effective teaching' may be seen as involving recognition of the learning and teaching principles which are valued, applying them with the e-learning tools now available, and developing skills in the use of the tools themselves.

Recent theorising about the nature of learning and teaching in higher education has shown many parallels with ideas which have been driving the educational design of new technology-based learning environments. However, arguably, the sharing of ideas between these fields of education has been limited and ideas influencing higher education practice are only at the early stages of addressing the use of new learning technologies. The work of Laurillard (2002) is an exception. She begins with what is known about student learning in higher education, generates a teaching strategy to accommodate this, and then develops her conversational framework for analysing the use of different forms of educational media.

Both higher education and educational technology discourse have stressed the centrality of the learner in successful teaching, rather than the transmission of knowledge by the teacher. In higher education in Australia and the United Kingdom, student learning research has focused on the quality of the student learning experience (e.g., Marton, Hounsell & Entwistle, 1997; Prosser & Trigwell, 1999; Ramsden, 2003) emphasising conceptual change by the learner and exploration of the qualitatively different ways in which people experience, conceptualise, perceive and understand the world around them (termed 'phenomenography' by Marton, 1981). Laurillard (2002) supports ideas from phenomenography for developing a principled teaching strategy, but influential United States-based contributions to the educational technology literature during the 1990s used constructivist perspectives, derived from cognitive psychology, to understand the nature of learning and teaching, particularly as the availability of computer-based learning technologies began to accelerate (e.g., Jonassen, 1991; Duffy & Jonassen, 1992; Jonassen, 1999). Constructivism, as an 'umbrella term for a wide diversity of views' (Duffy & Cunningham, 1996, p.171), focuses on construction of meaning by the student, placing emphasis on completion of contextualised real-world learning tasks and the role of support or scaffolding by the teacher until the learner becomes self-regulated and independent. The idea of social constructivism, derived from Vygotsky (1978), has been especially valuable in conceptualising the implementation of collaborative activities involving online communication and using them to create communities of practice (Lave, 1993).

The common focus of perspectives related to both phenomenography and constructivism on the central role of the student in learning, provides the opportunity to push the boundaries between them to enhance understanding about teaching with technology. In a similar way, understandings from other fields of education may be useful, particularly adult education where a range of perspectives which support the centrality of the learner in the learning experience have long been utilised by adult educators, using insights drawn from many disciplines and cross-disciplinary theoretical perspectives 'to illuminate their practice and enrich their theory' (Foley, 2000, p.16). In higher education, Biggs (1999, p.12) has already moved in this direction. He acknowledges phenomenography and constructivism as the dominant theoretical influences in student learning research in higher education, and while identifying himself as a constructivist, takes a pragmatic view about the two perspectives, placing importance on having 'a theory of learning that is broad-based and empirically sound, and that translates easily into practice.' Similarly, Webb (1996) supports diverse paths in identifying insights which inform staff development in higher education, while noting the influence of phenomenography and action research in this area.

The principles of good teaching do not alter when information technology is appropriately used to help make learning possible (Ramsden, 2003), but expanding the boundaries of how these principles are understood may be helpful in applying principles of good teaching in new contexts. Irrespective of theorising about the importance of the student learning experience, the teaching activities of many academics focus on the transmission of knowledge through their lecturing role. As a result, the movement to online teaching often begins by conceptualising the electronic environment as a content repository for disseminating unit information, lecture notes, PowerPoint files and the like. This approach does not optimise the capacities of the new environment and is far removed from the concept of student-centred learning. As Ramsden (2003, p.151) states: 'At its worst ICT is used to enable the passive reception of quantities of information.'

Using a constructivist viewpoint, Oliver (1999, 2000) highlights the importance of learning activities in e-learning design and the need to select these ahead of the content. He conceptualises online learning as consisting of three interrelated components: learning activities, content and student supports. Implementing this approach to learning design involves rethinking content so that it is not the major focus of teaching. Rather, it becomes a resource to allow students to undertake their learning activities, complemented by supports to guide them through the process. Possibilities include use of online communication tools which, as well as providing opportunities to support the learner, allow for a wide range of activities to facilitate learning (see Salmon, 2000, 2002). In addition, the visual capacities of e-learning environments allow students to see places, concepts or processes otherwise not immediately available to them (e.g., through the use of video, animation or simulation) and to engage with these for an immediate impact on their learning. Features such as these support a rethinking of the assessment process, allowing for continuous, realistic, contextualised tasks, which can often be supported with immediate feedback.

Exploiting e-learning opportunities presents a challenge for many teaching academics. It may involve a reversal in the way they think about their teaching, to place the focus on learning rather than teaching, and on learner activity rather than content. In addition, it may involve rethinking in visual terms material that they have previously engaged with only orally or textually. On top of this is the challenge of exploring the capacities of new technologies. Although the principles of good teaching may be seen as remaining constant, expressing them through ICTs, and facilitating professional development of teaching academics to transform university teaching, require careful consideration.

Professional development that complements the new context

Technology integration into teaching is embedded in Monash University's institutional vision (Monash University, 2002) and operationalised by the Learning and Teaching Plan which actively promotes the use of new technologies (Monash University, 2003). In keeping with this policy and strategy, WebCT Vista has been adopted as the centrally supported learning management system. Bates (2000, p.98) comments that assisting and enabling teaching staff to transform their teaching approaches to fit a non-linear, flexible environment 'is not something that can easily be picked up along the way as something to be done off the side of the desk while engaged in important or time consuming activities such as research.' He adds that assisting academic staff to integrate technology into their teaching is the single most important technology issue confronting his organisation.

The professional development challenge

There are two central issues which need to be addressed for academics to adapt their on-campus teaching to an electronic environment: identifying the pedagogical approach that addresses the learning and teaching need; and upskilling in the use of ICTs themselves. Transformation of university teaching to account for different kinds of learners requires an understanding of the pedagogies which address different learning styles. Understanding where ICTs can facilitate transformations requires an appreciation of the technologies, including what they can do and how they can be used.

Many teaching academics are driven by research as this is directly related to academic promotion and to government funding. They often lack formal professional training in teaching in higher education, and facing increasing workloads, lack time to invest in teaching innovation. A survey of 250 academics at Massey University in New Zealand (Pajo & Wallace, 2001) found that the most significant barrier to the uptake of technology in teaching was the time required to learn how to use the technology. Other significant barriers were the time associated with development, implementation and ongoing monitoring, and issues related to organisational support. In a recent study conducted at Monash University, academics identified advice on good practices in online teaching and learning as an area in which they required ongoing support (Weaver & Nair, 2004). Professional development strategies in this area at Monash University include induction programs, mentoring schemes, the Graduate Certificate of Higher Education, workshops on learning and teaching strategies, and a series of workshops on the effective use of the learning management system. Though seminars, short courses and workshops are effective avenues for exploring teaching, academics often prefer short targeted ('just-in-time') professional development with specific follow-up (Feist, 2003).

The DELTA solution

One initiative for meeting this need is the 'Designing Electronic Learning and Teaching Approaches' (DELTA) exemplars website. This is a professional development resource that supports the university's vision and organisational strategy, and considers the time-poor university teacher, making opportunities broader, flexible and available on demand as well as modelling good practice within the institutional environment.

The common characteristic of all DELTA examples is that they support engagement of the learner with the learning situation. Each example is placed in its own pedagogical context but beyond this DELTA does not impose a single theoretical perspective. Although some examples illustrate an approach to learning that acknowledges a particular theoretical framework, it is possible to approach most examples from a range of theoretical viewpoints, thus implementing the concept of pushing the boundaries between perspectives and allowing teaching academics to begin from the viewpoint with which they are most familiar and engage with the work of teaching academics who have pushed the boundaries in their

teaching practices. Innovators using ICTs have much to offer in terms of their experience with the design, development and implementation of learning materials. Successful innovators play an important role in diffusing the innovation, launching new ideas into the system. DELTA captures the innovative energy of these individuals to facilitate the diffusion of their ideas across the university teaching community.

Houseman (1997) describes how the gap between innovators and followers widens as innovators move with the leading edge of technology, suggesting that we should be providing a replay of the path that got the innovators to the point where they are now. DELTA provides that replay through information associated with the examples. It addresses questions posed by Houseman regarding the experiences of innovators, the tools they used and their pedagogical effectiveness, and includes an indication of the risks and their management. In addition to its professional development value, DELTA is a vehicle for recognition of innovations. Academics have reported that the lack of recognition and rewards for integrating technologies into teaching is a significant disincentive to their development (Pajo & Wallace, 2001). Most teaching innovations using technologies are only accessible to students enrolled in the unit. DELTA is a place where all teaching staff can view the essentials of innovations and gain an appreciation of a wide range of educational and technical designs from disciplines across the university while learning about and improving their practice through them.

About DELTA

DELTA examples are organised into five broad aspects of teaching (Figure 1). The examples in 'Integrated Approaches' are illustrations of how electronic learning and teaching approaches have been integrated across a whole unit or major unit component. Ways to integrate communication, learning activities, unit content and assessment tasks are demonstrated through examples that use a variety of learning and teaching strategies and, in some cases, different types of media. The Resources section provides support at multiple levels (faculty, institutional, national, international).

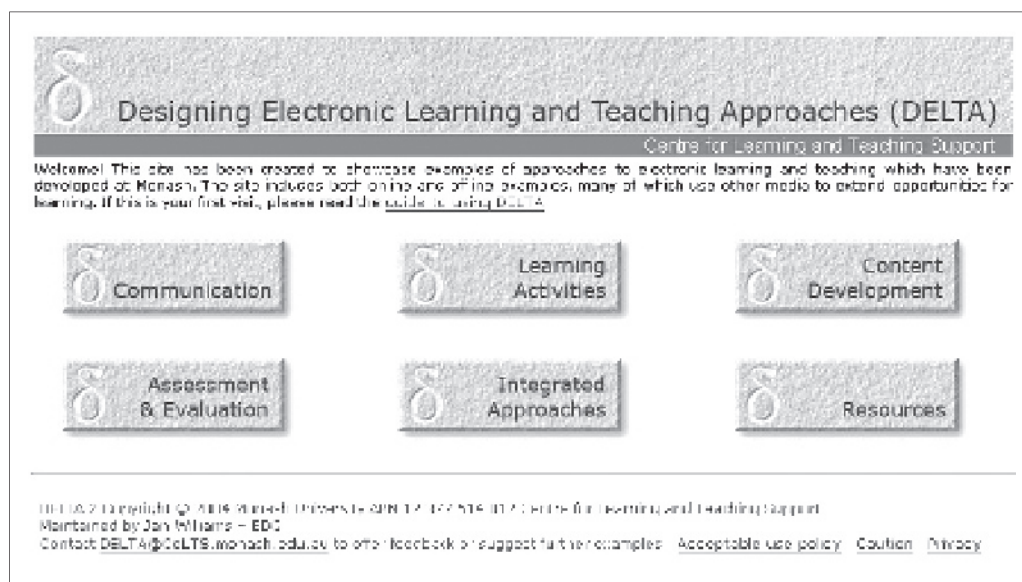


Figure 1. The DELTA home page indicating aspects of teaching

Currently over 50 examples are provided on the site, representing a broad coverage of learning and teaching strategies and discipline areas. Examples encompass on-campus, off-campus and off-shore teaching. Figure 2 indicates the overall structure of the site (up-arrows indicate where pedagogical contexts are set). The categories on the home page are linked to sub-menus listing examples. These are shown either as working examples (where possible) or as a series of screenshots.

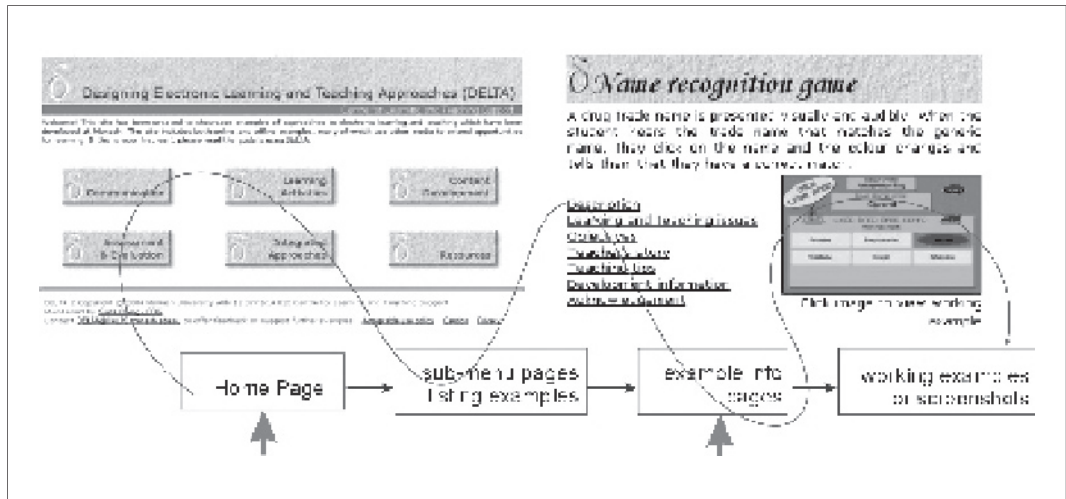


Figure 2. Overview of the DELTA site structure

Examples are described and the contexts further explored through an explanation of the learning and teaching issues and the learning objectives which the example is designed to address, together with a teacher's story, teaching tips and development information (Figure 3).

The example in Figure 3 is in the 'Integrated Approaches' category. In addition to the chapters indicated, the example includes a discussion forum, and use of real time chat, to allow students assigned to different stakeholder roles to meet and discuss the issues they are facing, drawing on theoretical explanations to assist them in this process.

Online problem based learning

This site contains chapters in the life of a young child called Laura which provide the focus for a problem based learning scenario.

Description: Learning and teaching issues
Objectives
Teacher's story
Teaching tips
Development information
Acknowledgements

Click image to view slideshow about example

Teacher's story

How we started (audio, text)
Designing the unit (audio, text)
Writing the weekly chapters (audio, text)
The discussion forum (audio, text)
The use of chat (audio, text)
Integrating PBL with the online environment (audio, text)
What we have learned about chat (audio, text)
Where we are now (audio, text)

Suzy Edwards

Figure 3. Setting contexts for examples

In the 'teacher's story' contributors share their experience of their development. They describe aspects such as motivation to develop e-learning materials, how they went about getting the project started, how they worked with designers, developers and producers, as well as their expectations and frustrations. They also describe the benefits of the materials, how they help in learning and teaching, and how the development changed the way students engage with others and with the subject matter. In the case in Figure 3 the story was recorded, bringing life and variety to its presentation and showing the value of different modes of communication.

Under 'learning and teaching issues' contributors discuss the issues which led to the development of the example. These range from the need to support students' understanding of complex concepts, to supporting student flexibility in the time, place and pace of their learning, to accommodating different learning styles.

The teaching tips allow for sharing of specific advice related to the teaching strategy in the example. Development information indicates the resources and time commitment required for the innovation, professional assistance needed (if any), benefits, potential pitfalls, and costs.

Using DELTA

DELTA was designed for three main groups of teaching academics: those working in their own time to inform their teaching through exploring examples of the work of colleagues; those working with educational designers to consider e-learning possibilities when designing their own teaching strategies; and those undertaking learning management system training (to assist in placing their training in a pedagogical context).

As a self-directed, just-in-time learning resource to assist teaching academics to explore examples, applications and pedagogies, DELTA encourages users to see beyond transmission of content. For instance, coupling a teacher's story with learning and teaching issues and teaching tips helps elaborate the underlying pedagogy, making the relevance of the example more transparent and transferable. When educational designers use DELTA with teaching academics they encourage them to see beyond the content and interpret designs for their own discipline and use. This directed use of DELTA supports them to find rapid solutions to their teaching needs. When DELTA is used in learning management system training workshops it underpins the concept of appropriate pedagogical use of the technology. Weaver, Button and Gilding (2002), reporting on learning management system training workshops at Monash University, indicate the need for a more holistic view of learning and teaching that is inclusive of pedagogy. DELTA addresses this broader perspective, giving greater context to the use of the learning management system tools. In using DELTA with learning management system training, the two central professional development issues for teaching academics in transforming their teaching are addressed: DELTA supports the identification of appropriate pedagogies that address the learning and teaching need and learning management system training supports upskilling in the use of ICTs themselves.

Summary

DELTA displays and describes good e-learning opportunities at Monash University, providing an alluvium to nourish and guide the use of educational technologies and push the boundaries of learning and teaching to illustrate effective, innovative ways to respond to the expanding diversity of learners. Teachers' innovations are used to advance an appreciation of possibilities for newcomers to e-learning. Through teachers' stories academics reflect on their experience to inform future developments both for themselves and others. This helps focus DELTA on those issues which matter to academics, and provides professional development just-in-time.

This response to the challenge of professional development for teaching with technology allows users to come to it from a range of pedagogical perspectives, as long as they accept the central principles of conceptualising learning from the learner's point of view and in terms of what the learner needs to do to meet a specified learning need. Hence, viewpoints consistent with phenomenography, constructivism or adult learning can be applied to help teaching academics rethink their teaching for an electronic environment, with a pragmatic merging of views from different perspectives often providing insights that are helpful. Although the principles of good teaching remain the same whether it occurs on-campus or electronically, for many teaching academics, adapting to technology advances and transforming their university teaching is not a simple matter: pushing the boundaries of both theory and practice is required. DELTA is the first stage of a planned suite of resources at Monash University to assist teaching staff to respond to the technology challenges of the changing higher education environment.

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