

# Along the continuum: From print to virtual worlds

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## Abstract

New ways of working with knowledge in education and industry require new approaches to teaching and learning that focus on building and applying knowledge rather than transmitting and storing it. Teacher quality is a key influence on student achievement and appears to be enhanced when teachers engage professionally with their peers. Graduate programs for teacher development need to encourage engagement in collaborative knowledge building. Collaborative approaches to working with authentic activities can be better supported by online education than by print-based distance education. Examples of different models of online education – print plus, substantive conversation, performance coaching, virtual seminar, online conference and simulation - are discussed.

## Introduction

It is now widely recognised that teacher quality is a key factor in increasing student achievement in schools (Darling-Hammond, 2000). King and Newmann (2001) note that it is common for professional development of teachers to be recommended as a key strategy for improving the capacity of schools to enhance student achievement. However, they observe that doubts have been raised about the effectiveness of professional development programs that do not embody key principles of direct relevance to teachers' work, long-term follow-up and feedback, collaboration with peers and personal ownership of the process.

These observations appear to have been confirmed in ongoing work at the University of Southern Queensland (USQ). In recent years the IDEAS (Innovative Designs for Enhancing the Achievements of Schools) program, developed at USQ in conjunction with Education Queensland (*IDEAS*, 2003), has been recognised in state, national and international venues for the contribution it has made to the revitalisation of educators' work in a variety of settings. A critical factor in its success appears to be the "professional conversation" that it initiates and sustains in the workplace as educators engage in developing shared practices. In developing those shared practices the participants are engaged in a knowledge building process which results in a product that might be described as a "conceptual artifact" (Bereiter, 2002).

Research elsewhere has also found that teachers who participate as "engaged professionals" rather than persisting with a form of "privatised practice" are more likely to adopt new practices which improve their effectiveness as teachers (Riel & Becker, 2000). In this study, "engaged professionals" were teachers who placed a high value on sharing knowledge with colleagues through mentoring, partnerships, teaching and publishing while those identified as in "private practice" were disengaged from the professional community. Even when teachers shared similar beliefs about the value of active student roles in learning, the "engaged professionals" were more effective in translating their beliefs into practice.

These points have not been missed by education systems, including Education Queensland (no date) which is actively investigating approaches to improved recruitment, retention and development of teachers (Leitch, 2002). The preferred approach is through what is being described as a "professional learning agenda" that would extend throughout the

professional life of a teacher with support for professional development in which the “learner owns the agenda”.

Postgraduate programs offered by universities have long been a significant form of professional development available to teachers. Such programs have offered the benefits of a formal qualification but have not always embodied the principles described above.

This paper is based on work undertaken as part of the redevelopment of the Master of Education program at USQ. It will begin by briefly describing some characteristics of the existing program. It will then outline the key ideas around which the program is being revised and describe, with examples, some alternative approaches being considered for teaching courses in the revised Master of Education program.

## **Revising the Master of Education program**

USQ is well known in Australia and internationally as an established provider of quality distance education programs. The evolution of its programs from the print-based correspondence model to more flexible modes has been described in terms of a series of generations (Taylor, 1995) in which the original print-based materials distributed via post were progressively supplemented by other media and communications channels. Throughout the changing generations, the Distance Education Centre at USQ has continued to develop increasingly efficient systems for preparing and delivering printed and other materials.

USQ was a pioneering adopter of online delivery, developing its first wholly online graduate certificate in 1996. This institutional move to increased use of online modes has been mostly successful though not without its challenges (McLendon & Albion, 2000). Some early attempts at online education were based on converting existing distance education materials for online delivery. This approach retained the long timelines required for preparing and delivering printed materials and there was a period of adjustment required to adapt teaching methods to make effective use of the communications opportunities available in online teaching. The wholly online courses have developed in a variety of ways that make good use of the affordances offered by the medium but there are still many courses in which the use of online facilities is limited to computer mediated communications to supplement more traditional print-based delivery.

The Master of Education program offered at USQ has been quite successful over the past decade. Enrolments continue to grow, reaching approximately 1000 students in 2003, and include an increasing proportion, up to 25%, of offshore students. The program has always been offered entirely by distance study using printed materials supplemented by residential schools, teletutorials, computer mediated communication and multimedia additions in selected courses. The majority of courses are still using these traditional distance approaches although in recent years some courses, mostly those related to online teaching and learning, have been offered entirely online.

Print-based courses at USQ consist of materials packages that typically include a short introductory booklet, study guide and one or more books of readings. In some courses, but not all, students may be required to purchase a textbook. The package, with textbook if required, is essentially self-contained. This arrangement has been convenient for students who are often geographically isolated and have little or no access to other study resources. The course study guide is frequently written as a guide to the textbook and other reading material. As a consequence changes to textbook or the selection of readings has typically required adjustments to the study guide. The need to keep materials up to date presents particular challenges in fields where there is rapid change.

Materials packages of the kind described in the previous paragraph can exert an influence on the teaching approaches adopted in courses. The development of extensive study packages that will support isolated students consumes a good deal of the resources available for teaching a course. When this use of resources has been coupled with the limited communication channels available until recently, the effect has been to skew the teaching towards transmission of knowledge rather than more interactive approaches that might be used in an equivalent face to face class.

Transmissive teaching methods reflected the industrial economies of the twentieth century, which were geared toward the efficient production and distribution of goods, but at the beginning of the twenty-first century there has been a pronounced shift in emphasis towards information as the focus of economic activity. As a consequence many more people are engaged in what is described as “knowledge work” which entails much more than the repetitive application of what they have learned. New understandings of the human mind and approaches to education that emphasise knowledge building rather than transmission are required (Bereiter, 2002).

This change in emphasis is consistent with current approaches to professional development of teachers as described above. Moreover, in recent years USQ has invested considerable resources in the development and support of Internet based systems that enable students to access information and communicate freely with staff and other students. The availability of these systems and increasingly widespread access to the Internet should lead to students being much less dependent upon materials prepared and distributed by USQ and able to assume more responsibility for locating and accessing information that is directly relevant to their particular interests within the framework of a course. Thus it is anticipated that courses will adopt knowledge building approaches that depend more upon the ability of staff to guide student development through a course than to provide extensive prepared materials. Such approaches are consistent with the nature of graduate education and the desire for students to own their own learning agendas.

The same Internet based systems offer opportunities for student collaboration that were not available with previous generations of distance education. Some existing online courses have adopted approaches in which students are encouraged to share the work they develop during a course. These practices will be extended as a means of encouraging students to become engaged professionally with each other and, where appropriate, with the wider professional community.

### **Online models for engaged professional knowledge building**

Despite the relatively short history of online education, there is a substantial body of publications offering suggestions for effective design and implementation. Some are distillations of experience into practical advice about the conduct of online discussions (Salmon, 2000) or the promotion of active online learning (Salmon, 2002). Others attempt to provide a broader theoretical framework to guide design of online environments which promote constructivist learning. Schneiderman (1998) proposed a three component philosophy which he characterised as “Relate-Create-Donate”. In this model students work in collaborative teams (relate) to develop ambitious projects (create) with results that have value outside the classroom (donate). A focus on authentic, knowledge building activity is a common theme in descriptions of online learning whether the activity has a real purpose as promoted by Schneiderman or is conducted in some form of simulation. In the latter case, recent work has suggested that engagement by the learners depends on a “willing suspension of disbelief” similar to that experienced in response to various art forms (Herrington, Oliver, & Reeves, 2003).

Online education at USQ has evolved since 1996 to include a variety of different approaches drawing on both local and published experience and research. This section will describe some of the models which have evolved in different courses and which might be adapted for use in the revised Master of Education program.

### **Print plus**

In the earliest days of online education at USQ it was thought that being an established provider of distance education would confer an advantage because so much prepared instructional material was already available. A substantial number of print-based packages were converted for online offering by rendering the selected readings as scanned images in PDF and the locally written material as HTML. Some courses were distributed in this way or as printed materials depending upon options selected by students. The content of these converted courses remained essentially unchanged from that designed for print distribution.

Computer mediated communication (CMC) facilities were made available for all courses, online and print. However, because the courses had been developed originally for print they did not typically include activities that would make effective use of the CMC. A few courses were modified to include activities that encouraged students to engage with each other and/or the teaching staff using CMC but the many students studying in print-based mode had limited or no access to CMC and it remained an optional component.

There is nothing inherently wrong with distributing course materials in the form of atoms (in print or CD-ROM) rather than as bits (online) (Negroponte, 1995). For certain content, such as video, where network capacity may present challenges or where student access is limited postal distribution of the core materials may be the most appropriate solution. However, even where the bulk of course content is provided in this way the addition of appropriately designed and implemented online activities (Salmon, 2000, 2002) supports more collaborative learning than would otherwise be possible.

Some courses currently use such approaches to facilitate interaction among distance students who are mostly practising teachers and pre-service teachers studying on campus. The blending of the wisdom of classroom experience with youthful enthusiasm and technological skills offers benefits to both groups in developing better understanding of the classroom applications of information and communication technologies.

### **Substantive conversation**

Substantive conversation has been identified as a key standard of authentic instruction (Newmann & Wehlage, 1993) and as one of the productive pedagogies which promotes “coherent shared understanding” (Education Queensland, 2001). It is characterised by sustained dialogue about matters of intellectual substance that is not scripted or directed by the teacher.

In stark contrast to conventional face to face teaching, traditional print-based distance education offers little or no opportunity for such interaction. Online education can provide a variety of different communication methods that might support substantive conversation as a pedagogical form. Asynchronous communication by email or discussion forums can work well for some purposes and may encourage more thoughtful contributions because responses do not have to be generated in real time. Particular efforts may be required to encourage participation by establishing social presence (Gunawardena & Zittle, 1997). Synchronous communication using text chat, shared workspaces or audio/video offers greater spontaneity, which may assist with creating group cohesion. Most online environments, including

BlackBoard and WebCT Vista as used at USQ, support both asynchronous and synchronous communication.

Several of the wholly online courses offered at USQ have developed teaching approaches around the use of online discussions to build shared understanding through substantive conversations. Students are invited (or required) to respond to some stimulus which may be a reading, website or their own experience in the form of a “reflection” posted in the discussion area. Skilled moderation (Salmon, 2000) may be required to sustain and develop the ensuing conversation in ways that encourage further contributions to building understanding of the course topic.

### **Performance coaching**

Another affordance of face to face teaching that has typically not been available through print-based distance education is timely feedback on student performance. Structured activities embedded in the materials and the ready availability of teachers by telephone have helped but are seldom as responsive or effective as a teacher in a classroom for shaping performance.

For many purposes the asynchronous communications methods available in online courses can provide prompt and effective feedback without the difficulty of getting both parties to a telephone simultaneously and synchronous communications can support “virtual office hours” for more directly interactive feedback. In addition, it is possible to embed interactive activities, or COOLTools (USQ, 2003), which can provide immediate feedback to support student understanding and may return information about student progress to the teacher.

One USQ course which adopts a performance coaching approach teaches skills for creating simple multimedia through a series of carefully sequenced exercises based on examples provided in the materials (Fisher, 2000). This approach was adopted to ensure that so far as possible all students would gain a similar range of basic skills in multimedia creation and to provide clear models for development of those skills. In one example of an activity sequence, students write a haiku, set it as text in a font they select and convert the text to an image for display in a web page. They subsequently embellish the image, animate it and record their own voice reading the haiku mixed with music or sound effects. The sound and image(s) are then presented first as a QuickTime movie and later using Macromedia Flash. This process affords students opportunities to practise a variety of skills on the same content and to compare the capabilities of various multimedia tools.

At each step students are encouraged to share their creations with their peers by publishing them on a web page and posting the URL to the course discussion area. Students are able to ask other students for information about how they achieved particular effects. They are also able to seek direct support from course staff when they experience difficulties. Where appropriate responses are made available to all class members, without identifying the source of the question, as a further means of supporting other students.

Student response to the course has been positive. The version of the course offered in 1999 and 2000 was open ended in its approach, allowing students to select their own projects that may not have provided opportunities to develop key skills. The revised course has a lower risk of students missing key concepts and skills. Despite, or perhaps because of, the tighter structure, student responses to the later offerings have been noticeably more positive. Responses to open-ended questions indicate that most students found the structured activities helpful for developing the core skills. One or two commented that they would have preferred to work on individual projects and several used the small project in the final assessment to develop a product that could be applied in their own work. The opportunity to apply learning

from the course to personally satisfying projects is available and is enhanced by the improved levels of skills development achieved through the more structured course.

### **Virtual seminar**

Another standard of authentic instruction is “connectedness to the world beyond the classroom” (Newmann & Wehlage, 1993). The same concept is included in both the productive pedagogies (Education Queensland, 2001) and the “relate-create-donate” approach (Schneiderman, 1998). Print-based distance education courses have applied these ideas through appropriately designed embedded activities and authentic assessment which has allowed students to gain course credit while completing activities that can be usefully applied in their own context.

Online education offers additional options for collaborative work with connections to the real world. Compared to face to face classes, in print-based courses, long communication times can restrict the opportunities of students to confer with the teacher, peers or others beyond their local context. In online courses these restrictions are relaxed or removed.

One successful online course model at USQ operates along the lines of a graduate seminar. Rather than provide students with large amounts of prepared content the seminar course presents a series of related modules, each with a short stimulus paper, pointers to selected readings and structured activities, which may require students to conduct a short survey in their local context or collect other forms of information. The products of student work are then shared through the discussion forum and used to develop the course themes. The activities may contribute towards course assessment as well as to increased understanding of the student’s own context with a potential to inform future work there.

### **Online conference**

Many print-based courses require students to prepare substantial papers. The reading and preparation of the paper is a significant learning activity and the paper provides a basis for assessment of student performance. Constraints on time and communication methods typically do not allow for the exchange of papers among students. However, online courses need not be subject to the same restrictions since files and messages can be exchanged relatively easily and quickly.

One USQ online course is built around an online conference about multimedia applications in education. Students are provided with a small collection of stimulus readings in a broad topic area and are asked to prepare a proposal for a paper to be delivered in the online conference. The proposals are graded and students each prepare anonymous peer reviews of two proposals. The reviews are also graded. Using the grading and reviews for guidance, students complete their papers, which are presented online and used as the basis of discussions hosted by the authors of the papers over a three week conference period. As a final activity students are required to select a small number of papers from the conference and write an introduction to their collection. The design is intended to ensure that students have opportunity to pursue a topic of individual interest at depth as well as a requirement to gain broad familiarity with the field.

Students tend to prepare high quality papers that have some immediate value in their own context but the papers can have significance for other students in the class and more widely. In the first offer of the class, students published their papers on their own web sites and they were linked from the conference site. One paper was found in a search by a large company that subsequently contacted the student and retained him to undertake a significant consultancy based on the paper. A version of another paper from the same class was

subsequently published in a refereed international journal. In the second, and most recent class, students were advised of a call for papers from an online conference sponsored by a university in the USA. Two student papers were submitted and accepted for the online conference.

## **Simulation**

Despite the evident value of learning in real contexts it is sometimes preferable to work with a simulation than with the real world. Classic examples include the use of simulators for flight training but computer-based and online simulations have proved useful in fields such as nursing practice (Naidu, Oliver, & Koronios, 1999) and a variety of other vocational training applications (Oliver, 2001). A strong base of theory relevant to the design and implementation of such environments is developing (Jonassen & Hernandez-Serrano, 2002; Oliver, Harper, Hedberg, Wills, & Agostinho, 2002).

One existing course in the Master of Education program makes limited use of a multimedia simulation constructed with problem-based learning as the underlying design framework (Albion & Gibson, 1998; Gibson & Albion, 1999). The materials are presented for use in an HTML browser, either direct from CD-ROM or from a web server. They incorporate numerous images, over 100 QuickTime video clips comprising more than an hour of video content, and a small number of interactive components. The quantity of video has made it impracticable to offer this type of material over the Internet but this may change with improvements in video compression methods, increased bandwidth and the possibility of hybrid models in which video is delivered on CD-ROM for integration with web-based content.

The materials comprise four problems, each set in the context of a newly graduated teacher taking up a teaching position which requires planning for the integration of ICTs into teaching. Although the materials would most often be used in the context of a class where there would be support from an instructor and opportunity for interaction with peers, they were designed to support individual use. This support is manifested as scaffolding by presentation of each problem as a series of sub-problems or tasks and through the provision of specific help at each stage and a substantial collection of resources relevant to the application of ICTs in teaching. A strong narrative thread is provided to encourage the user to become immersed in the activities. In a fully online offering these interaction with peers and teacher would be facilitated using CMC.

Scenarios and cases presented with little or no media content can also be effective. The key to their success is providing authentic stimulus material that promotes engagement by students with the issues (Herrington et al., 2003). In some cases it may be educationally appropriate to engage students in the processes of generating cases for discussion by peers.

## **Conclusion**

Print-based distance education has served the USQ Master of Education program well. The materials and methods developed during the past several years may still have a role to play in delivery of the program but they cannot provide a complete response to the emerging needs of the program.

A contemporary Master of Education program requires an increased focus on building and applying knowledge rather than transmitting and storing it. It needs to promote authentic learning that relates more directly to the professional contexts in which students find themselves. It needs to promote “engaged professionalism” in which educators develop dispositions and capabilities for sharing knowledge with colleagues. Online education

supports approaches to teaching and learning that increase the likelihood that courses will be able to achieve these goals.

As described above, there is no single approach to using online tools that works best in every educational situation. There are multiple possible approaches, more than enumerated above, that may be used individually or in combination. Developing faculty capacity to expand the use of online approaches will require that we take a dose of our own medicine, working collaboratively to build knowledge about teaching and learning in the twenty-first century.

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