The change in academic skill base required for the transition from face-to-face teaching to blended delivery

Wendy Barber and Maureen Wilkinson

University of South Australia

This paper describes the authors' experiences over the past ten years in the transition from teaching a medical sonography program predominantly face to face to using a variety of teaching methodologies to facilitate flexibility in time and place of study and to accommodate the varying requirements of the students, University and the profession. Despite position descriptions remaining essentially the same during this time, the roles, responsibilities and skill base of lecturers in this area have changed dramatically to accommodate the transition to blended delivery. These changes have impacted significantly on the University's ability to recruit and retain staff in the medical sonography program and also have implications for induction programs, workload allocation and ongoing professional development for academic staff.

Introduction

With rapid advances in information communication technology and the changing learning contexts of our students Universities need to be nationally and globally competitive. Universities are shifting away from conventional face-to-face teaching and adopting a range of teaching approaches which include face-to-face lectures and workshops, self-directed learning, web-based collaborative learning and external delivery. These use a combination of print-based materials, texts, DVDs and online resources. This combination of methods is referred to in the literature as flexible or blended delivery (Kennedy, 2005). It has the advantage over on-campus face-to-face teaching in that students can choose when and where to study, regardless of where they live and work. Also the diversity of learning resources provides more opportunities for matching individual students' preferred learning styles. The University of South Australia describes flexible delivery as 'the provision of resources and application of technologies to create, store and distribute program content, enrich communication, and provide support and services to enable both more effective learning and better management of learning by the learner' (retrieved September 26 2005, from http://www.unisanet.unisa.edu.au/learningconnection/staff/framework/flexible.asp)

Background

The authors are both employed as lecturers in the postgraduate course-work programs in medical sonography at the University of South Australia. By way of explanation, medical sonography is the imaging of the body using high frequency sound waves and is most commonly renowned for its role in obstetric assessment. The first author has been teaching in both undergraduate and postgraduate programs at the University and its antecedent institution for 22 years and the second author has been principally involved in the postgraduate program for the past 8 years.

The postgraduate program in medical sonography first commenced at this University in 1994, when it was offered on-campus part-time using conventional face-to-face teaching with students attending lectures and practical sessions at the University in the evenings. Medical sonography programs of necessity have a high level of practical theory incorporated and need to meet both University standards and the accreditation requirements of the profession. In order to complete the practically-oriented courses in our program, our students are required to be working in an ultrasound department and regularly scanning patients. All our students have previously completed an undergraduate qualification in medical radiation or another health science specialisation and most also have work experience in these areas. Most of our current students are employed full-time in medical imaging departments in either metropolitan or rural locations in Australia and New Zealand.

Over the past ten years, the teaching methodologies, student support strategies and skill base of academic staff members have had to change considerably to match the varying needs and learning contexts of these health professionals and the changing University environment. The changing academic role and university expectations of academic staff members have resulted in significant difficulties in both recruiting and retaining a 0.6 time lecturer in medical sonography in our School. When this position was first advertised the emphasis was on professional qualifications, breadth of ultrasound scanning experience, and a demonstrated high level of written, verbal and interpersonal communication skills plus administrative skills. Teaching experience in ultrasound and awareness of the School's current teaching methodologies were listed as desirable rather than essential attributes of the applicant.

The first appointee to this position worked at the University for 4.5 years. She left after experiencing severe episodes of stress-related illness and anxiety over the previous several months. Her reasons for leaving were that the three day a week job seemed to extend into her evenings and weekends on a regular basis. There was just too much work to do between organising lectures and workshops for the internal students, developing study packages for the external students, answering student queries in person, via telephone, fax, mail and increasingly email, regular meetings to attend and a constant backlog of administrative tasks to complete. She really enjoyed and excelled in giving lectures, running workshops and working directly with students. She considered that all the other expectations and demands on her time made it impossible to complete her core responsibilities to her desired level of satisfaction.

Since her resignation six years ago, the School has appointed five more sonographers to this position, either on contract, via secondment or as a continuing position. For a period of six months in 2004, the position was unfilled and the two authors had to absorb the responsibilities of this position on top of their own workloads. Two of the sonographers who were employed on contract did actually apply for the tenured position but were unsuccessful due to the University's current expectation that a level B academic staff member should have (or be nearing completion of) a PhD or at least a research Masters with a proven research record. One of these applicants had 25 years experience as a sonographer with appropriate professional qualifications but no postgraduate tertiary qualifications and hence wasn't even short-listed for the tenured position. The other applicant held a course-work Masters degree in Medical Sonography which had a research component but after interview was not deemed suitable for appointment. It should be noted that currently there are no sonographers in South Australia with a PhD and only one sonographer in Adelaide who is studying a PhD in the area of medical sonography. Thankfully she is the current lecturer in this position. Since this appointment in 2004 we have also lost the other two lecturers (one tenured, one casual) contributing to the core theoretical courses, one to an undergraduate clinical coordination role and the other to increasing work commitments outside the University. The current situation is 2.4 academic staff members coordinating and teaching a total of 16 postgraduate courses!

Change in teaching methodologies

As stated in the previous section, the medical sonography program was first offered on-campus part-time using conventional face-to-face teaching, with students attending lectures and practical sessions at the University in the evenings. A printed course outline and lecture notes

were provided for each course. At this time the program was planned for and catered only for local students. By 1996 it was evident that this mode of delivery had limitations in that many students had difficulty attending the evening lectures due to shift-work and/or family responsibilities. Rural and remote sonographers were also greatly disadvantaged by their inability to attend on-campus classes during the week and the lack of any external medical sonography programs in Australia. It was decided to trial the introduction of mixed mode delivery with a small cohort of students studying one of the first courses in the program (pertaining to ultrasound physics and equipment) in external mode, whilst still maintaining the internal mode of delivery for metropolitan students who were able to attend the University. A printed Study Guide was written which linked with an ultrasound physics text. Content was broken down into six modules, each comprising two weeks work. Students were provided with aims, learning objectives and key concepts for each module. These were reviewed using self-checking multiple choice exercises provided in the Study Guide and a short set of tutorial exercises for each module which were submitted to the lecturer for marking.

In the first semester of offering this course in mixed mode, there were 7 external students and 13 internal students. By the next semester when the second ultrasound physics and equipment course was offered, two thirds of the students had switched to external mode and were no longer attending the lectures. Evaluation showed that students favoured the external mode of delivery as it fitted better with their busy lifestyles of working full-time, often being involved in shift work and on-call rosters, family and personal commitments. External delivery thus provided them with the flexibility to choose when and where they studied. By the end of this first year of offering mixed-mode only a very small percentage of students preferring face-to-face delivery remained. It became uneconomical to continue to offer weekly lectures. Therefore, it was decided that all courses in the program would be sequentially developed for external delivery and a weekend workshop for each course would be offered. Videotapes and audiotapes of lecturers covering the key concepts for each module and demonstrating scanning techniques and equipment manipulation were produced to supplement the printed materials and to support the students who preferred to learn by listening and watching practical demonstrations.

Each study package in the program was developed replicating the design of the first course developed for external delivery, with a printed Course information, Study Guide, printed Readings incorporating recent journal articles and text extracts, supplemented by videotapes providing guidance and practical demonstrations. Weekend workshops were also provided for all courses in the program (one per course, usually held later in the semester). These weren't compulsory but were very well attended by both local and interstate students. These students valued the opportunity to meet their lecturers, chat with other students and clarify any issues with the course content in preparation for the end of semester examination(s).

With the introduction of the University's online learning environment (UniSAnet) in 1999, lecturers were encouraged to explore the opportunities for providing online learning resources for this program. In 2001 we commenced the development of course home pages for each of the courses in our postgraduate medical sonography program. Initially this was limited to the loading of the course information and Study Guide as a Word or PDF document and the introduction of an online discussion. The documents were not specifically tailored to web-based delivery – they were the same as the printed versions which are posted to students as part of their study package – so the only advantages to students were prompt access if their materials had not yet been received via post and quick links to University sites referred to in the course information to download forms and access services. Online discussions were used infrequently by students to chat with other students studying the same course and to ask questions of the lecturer regarding the course content or assessment. Most students had little or no experience with computers for study purposes at this time and were reluctant to try online learning methods.

Over the past four years the development of the online resources on the course home pages has gradually evolved and with an increasing number of students who are comfortable with computers even the online discussions are becoming more popular. All students can submit and receive their marked assignments electronically using 'AssignIT' (part of UniSAnet platform). Videos have now been replaced by DVDs and lecturers are currently trialling the use of CaptureCAM™-PRO[1]. This is a form of audio-visual (AV) grabber that allows the user to produce AV files directly from their real-time interaction with a computer workstation running

Windows operating system (2000, XP, or higher). Image quality is maintained despite significant compression of files and lecturers have created a variety of CaptureCAM presentations including:

- A brief segment showing students how to navigate from the University home page to specific online learning resources developed for their course;
- Explanation of anatomical landmarks on an ultrasound image;
- Cross-sectional anatomy of the heart, correlating anatomical diagrams with cadaver slices.

One of our Masters students has recently prepared a complete lecture series on vascular ultrasound using a student version of CaptureCAM-PRO and has given the University copyright permission to copy and distribute his CD to students as part of their study package for 2006. This brief experience shows this software has excellent potential in the provision of support to students using the online learning environment for the first time, delivery of lectures to external students, presentation of case studies and providing assignment feedback.

There has been a rapid increase in the number of students in our postgraduate programs since we have offered them externally (from 60 students in 1997 to 230 students in 2005). Also there are increasing numbers of students who are unable to attend weekend workshops due to geographical location, work and family commitments. Therefore, we are gradually introducing online image interpretation tutorials, practice examinations and online discussions to replicate the experiences and interaction that students enjoy at the workshops.

Change in academic skill base

Since our programs are designed to produce health professionals who are eligible to practise as accredited medical sonographers upon graduation, it is imperative that we address professional requirements in both the curriculum design and assessment of our students. To achieve this, our lecturers must be accredited medical sonographers, which requires postgraduate qualifications in medical sonography and active participation in continuing professional development to maintain their accreditation. In addition to this, the University requires lecturers to hold at least the equivalent or preferably a higher qualification in their professional area than the level of the program in which they teach. Our postgraduate programs are nested and range from Graduate Certificate to Masters level so lecturers should hold a Masters degree as a minimum. It is also an expectation that staff actively participate in research and publication and they ideally should hold a PhD.

In addition to these qualifications it is desirable that lecturers have qualifications and/or experience in various teaching methodologies, specifically directed to adult learners. Face to face teaching experience, although valuable, is limited in application to weekend workshops and lecturers are now expected to be comfortable using a range of teaching methodologies, most of which don't involve face-to-face interaction with students. As most lecturers in our discipline area entered the University environment with as much (or as little!) IT knowledge as our students, there is a steep learning curve to conquer in implementing web-based teaching and learning programs. Until recently there has not been a formal induction program for new academics incorporating adult teaching and learning theory, so lecturers have had to seek out this knowledge themselves through attending workshops and conferences or undertaking tertiary studies in adult and distance education. Although ultimately rewarding, many extra hours are required in designing, writing and uploading online resources for students. For example, it can take from a couple of hours for a simple multiple-choice quiz to an entire day to develop and upload an online quiz incorporating images and questions requiring different types of responses. Our increasing student numbers demonstrate the popularity of our program design and delivery methods, but what does not seem to have been fully recognised by the University is the significant increase in academic workload associated with both resource development and administrative time with the move towards blended delivery. It is acknowledged that the time required in subsequent years to update these resources is not as great as in the year of initial creation, but due to the ever-evolving field of medical sonography we do need to update our resources regularly to keep our courses leading-edge.

AssignIT is an excellent tool for students to submit their assignments electronically and for lecturers to mark and return assignments quickly, without the need for printing out assignments, logging of receipt and return of assignments by administrative staff and it has a subsequent reduction in postage costs. It does, however, significantly increase the administrative workload of lecturers, especially when using external assessors for marking. In a course with 70 students, it takes the better part of a day to download and save assignments and then return marked assignments to students with grades and comments recorded (this doesn't include marking time). Occasionally there are server problems preventing access to AssignIT and due to the nature of our program, some assignment files incorporating diagrams and images can be quite large, increasing the download and return times, especially when completed off-campus via a modem connection. Students experiencing difficulties using AssignIT tend to contact the course coordinator directly, so we often find ourselves trying to troubleshoot technical difficulties, instructing students on how to reduce their file and image sizes and liaising with technical staff regarding service difficulties and faults.

Providing individual assistance to students experiencing difficulties with the course content can also be more time consuming with blended delivery, especially when not all students regularly access the online discussion. In a face-to-face lecture, students are encouraged to ask questions and often one student asks a question that is of concern to a number of the students present. With external delivery, students have little or no opportunity to be in the same venue as the lecturer to ask questions so the lecturer may receive the same question from as many as 40 students, either in person, via the telephone, fax, mail, email or online discussion. With increasing experience teaching this way, we are able to predict areas of concern, modify our study materials accordingly and load frequently asked questions and answers onto the course home page. However this all takes time and there are invariably new questions each year. Students are continually encouraged to use the online discussion to pose questions related to course content and assessment but due to restricted Internet access, a lack of confidence and/or familiarity with the online environment, many students are reluctant to do this and prefer to communicate directly with the lecturer.

Facilitating an online discussion also requires a different set of skills for lecturers from those used to face-to-face to maximise the learning and collaborative opportunities for students, although this point is contested in the literature (Burge and O'Rourke, 1998; Anderson et al, 2001; Bennett and Marsh, 2002). There is a lack of non-verbal cues and cultural markers in online interactions which are based on 'spoken text in written form' (Twomey, 2004, p.454). Responses in asynchronous discussions may be quite delayed and often new topics are commenced before others have concluded. Misunderstandings are more common and it is more difficult for the lecturer to encourage all students to participate, especially in our program where online discussions are not assessed but are provided more as a means of interaction between students to reduce the feelings of isolation, rather than as a formal mode of learning.

Qualities in lecturers that our external students identified last year in focus groups and evaluation surveys, as being most important to their level of success and satisfaction with a course were:

- Responsiveness to their enquiries and needs, either via phone, email or online discussion;
- Knowledge of course content;
- Prompt assignment turnaround time with useful feedback provided on their progress;
- Approachability – being friendly, supportive, empathetic to their personal circumstances and encouraging students to ask questions, no matter how trivial they may seem at the time.

These differ from some of the qualities and skills students appreciate in a face to face teacher, for example oral presentation skills, effective use of audiovisual aids, ability to answer questions and explain concepts clearly. With the exception of the content knowledge, all of the skills and qualities identified by our external students as being most important in a blended delivery program tend to be inherent skills in the individual rather than acquired or learned. High level administrative and organisational skills are considered essential to being an effective lecturer in our program, yet these skills are quite difficult to ascertain in a job application or at interview. Even referee reports can be misleading as an applicant who has excellent administrative and

organisational skills in the clinical environment, when managing the day's work in an ultrasound department, may be quite out of their depth when faced with preparing study materials and online resources, marking assignments, responding to student enquiries and completing a wide range of administrative tasks within strict timelines.

McCardle and Coutts (2003, p.228) describe good teachers as knowing what they are talking about with the ability to 'manipulate or contextualise knowledge to make it relevant or interesting for learners'. They identify the following skills as being crucial to this process:

- Ability to work with a range of educational approaches, for example group work, individual tuition (p.228)
- Excellent verbal and non-verbal communications skills so they can develop an easy rapport, support individuals and large groups and be versatile in their forms of communication (p.228)
- Possess skills in the cognitive domain to participate in and encourage problem solving and critical thinking in students (p.229).

DeBourgh (2003) conducted a study of graduate nursing students' satisfaction with a course taught via interactive video teleconferencing and the World Wide Web. A correlative research design examined the relationships among 5 learner attributes and 3 instructional variables and student satisfaction in a group of 43 graduate nurse students (p.149). Results of this study indicated that it was the quality and effectiveness of the instructor and instruction, rather than the technology, that was associated with overall student satisfaction. Students favoured instructors who provided individual feedback and promoted contact with students between instructional sessions (p.151). With regard to professional development for instructors, it was concluded that the focus should be on the development of effective instructional strategies rather than the mastery of the relevant technology (p.161).

Professional development and support for academic staff

In a paper titled 'Strategic support for online teaching and learning', the authors state that 'if academic staff are required to succeed in the transition to new modes of teaching, then support for this shift in teaching practice should be holistic in scope, responsive in nature, and sensitive to changes in academic roles and responsibilities'' (Kulski, Boase-Jelinek, Quinton and Pedalina, 2002, p.1). They recommend that to best facilitate staff development of skills in incorporating new online technologies in their teaching, a kit should be developed that provides a variety of tools which assist in the creation of interactive quizzes, exercises, case studies, animated simulations and other online resources (p.2). This description equates well to our UniSAnet2 platform, which is the online learning environment developed specifically for staff and students of the University of South Australia. Training for staff in using UniSAnet to develop resources for their courses is available online through 'Author help' and is also provided by online advisers through workshops or on an individual basis in staff offices. Although UniSAnet does provide a user-friendly interface for staff members not familiar with creating web content to construct quizzes, online discussions, learning guides and links to other web-based resources, it is still a time-consuming process and can be quite cumbersome to use at times.

Carr and Farley (2003, p.408), when outlining strategies for redesigning courses for online delivery, affirm that faculty members need support in the form of time release from other teaching responsibilities, additional funding to cover teaching during this time, a team approach using an instructional designer, graphic artist, Web designer and programmer to design and develop the resources and the appropriate computers, software and technology support to facilitate this process. This view is supported by other authors in the field (Milstead and Nelson, 1998; Care and Scanlon, 2000; Schulz, 2002). This is similar to the model originally adopted at the University of South Australia when we developed our first courses for distance education almost ten years ago. The primary author was given partial time release for a semester, editorial and instructional development support in addition to access to the graphic artists, audiovisual and technical staff at the Flexible Learning Centre of the University.

With the introduction of UniSAnet most of these responsibilities have been devolved back to the School level although a limited number of projects that are specific to the University's strategic plan are identified by Schools and Divisions each year to be supported by the Flexible Learning Centre. As part of this service agreement, academic staff members are teamed with an online adviser and graphic artist to develop new courses or resources to better support their staff, students and programs. For the most part, however, lecturers are expected to revise and edit their own study materials each year and develop online resources to support their courses. For the newly appointed lecturer in medical sonography, who is still becoming acquainted with a very different work environment, the range of administrative tasks to be completed within a study period can be quite daunting. Even though all of our course materials have now been developed and revised over a number of years, it is still an expectation of the new lecturer to become very familiar with the resources and course content and update them to reflect current practice in medical sonography and also their own personal knowledge and experience that they bring to the position. In addition to this, they need to quickly acquaint themselves with the various programs and applications used within the University to maintain staff and student records (UniSAInfo), the online teaching and learning environment (UniSAnet), student result entry (Medici), email (Outlook) in addition to a wealth of staff resources on the intranet. The staff induction program now addresses some of these issues but for the most part new lecturers find their colleagues the most useful and reliable mentors and sources of information during this early stage of their academic career. Most lecturers who have worked in our area have commented that they didn't begin to feel comfortable and 'in control' in their position until they had been here a year, and even then, the changes are so frequent that the learning never ends!

Conclusion

Forrest (2004) summarises the factors to be considered when incorporating new teaching methodologies as:

1. the roles of the teacher as an expert, motivator, evaluator of personal performance, and modifier of learner goals;
2. instructional skills and strategies including oral communication techniques, use of multimedia instructional technology, and motivational behaviours; and
3. an awareness of learning styles, including environmental and affective factors and cognitive preferences (p.79).

This summary concurs with our experience over the past ten years in the transition from teaching a medical sonography program predominantly face to face to using a variety of teaching methodologies to facilitate flexibility in time and place of study and to accommodate the varying requirements of the students, University and the profession. We believe the University should be responsive to these changes in academic skill base in its recruitment strategies, induction programs and ongoing professional development for academic staff. Workload allocations should take into account the increased administrative workloads imposed on academic staff teaching via blended delivery and the important role that some lecturers play in mentoring and supporting new staff members and students unfamiliar with the flexible learning environment.

Notes

1 CaptureCAM™-PRO is licensed to Cintinel Corporation. More information is available from http://www.cintinel.com/

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