

Chapter 4

Toward New Models of Flexible Education to Enhance Quality in Australian Higher Education

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Introduction

In this chapter we focus on models of flexible education as related to Australian higher education (with an argument that this is typical of developments worldwide). Moreover, Deakin University's long-standing experience in flexible, online, and distance education, as a case study of changes in Australian higher education, will be highlighted, with a particular emphasis on developments in teaching engineering and technology flexibly. To begin, we provide coverage of contemporary developments in quality enhancements in teaching and learning in Australian higher education, arguing that flexible education is a key institutional response to external demands. The meanings of flexible education and blended learning are then considered and a contingency-based framework for designing flexible education outlined. The framework will consider models of flexible education design in the light of goals, the roles, needs, and circumstances of teaching staff and learners, the changing technological environment, and the requirements of various external stakeholders. The focus will then move to course and unit concerns relating to flexible educational models of course design

and operation as illustrated through the case of engineering and technology at Deakin. The final section will give some consideration to future directions in flexible education.

Enhancing quality in teaching and learning in Australian higher education

Since 1993, Australia has surveyed all completing undergraduate students (on- and off-campus) using an instrument known as the Course Experience Questionnaire (CEQ) (Graduate Careers Australia, 2007). The CEQ has a long history of development and research that confirms that it is a reliable and valid measure of students' perception of their learning environment, and is based on earlier work which shows there is a strong link between this and quality of student learning (Wilson, Lissio & Ramsden, 1997). A large analysis of open-ended comments made by university graduates on their studies as part of the CEQ has recently been completed (Scott, 2006). Apart from highlighting the complex and multi-faceted nature of quality that arises from such a diverse group of users, graduates indicated that it is the total university experience that counts. This finding confirms the idea from total quality management that all areas of an organization contribute to the final quality of the services and products (Juran, 1988). There is a system-wide 'quality function' that exists and impacts on quality. In a flexible and distance education context, this implies that the student perception of quality is likely to be influenced just as much by the late delivery of materials, the amount of network downtime, the promptness of replies from student services, and the availability of titles for borrowing from the library as it is to be influenced by currency of course material. Increasingly, with the services traditionally offered to distance education students now being made available to their on-campus counterparts through electronic means (and vice versa in the case of recorded lectures delivered over the Web to distance students), quality failures can adversely affect all types of students'

learning experiences in the system. Equally, quality improvements can benefit the full range of students' learning experiences as well. A unifying philosophy is therefore required to enhance the quality of teaching and learning across all student cohorts serviced by a university committed to distance education.

With a focus on pedagogy, excellence in teaching involves:

- placing learning at the centre of interactions with students, with optimal use of learning time and available resources;
- creating rich learning environments that give varied opportunities for active learning that lead to the development of appropriate knowledge, technical skills, and competencies required in many disciplines;
- knowing curriculum content well and using it creatively, as well as knowing the gaps in relevant current disciplinary bases and how both students and staff might contribute to development in the field of knowledge;
- preparing well for teaching — including establishing challenging but clear expectations as well as developing efficient and well-structured course materials and active and engaging pedagogical activities;
- having highly developed skills for working in teaching teams (sometimes cross-disciplinary) and for supporting teaching colleagues;
- maximizing uses of diverse learning environments, both traditional and leading-edge tools, and a variety of modes of communication, learning, and teaching;
- recognizing the integration of, and connections between, teaching, learning, and research;
- having high levels of skills suitable for a variety of teaching roles; and
- attending to the need for teaching staff to liaise with sections of the university that provide support for teaching and learning.

With a focus on learners, excellence in teaching involves:

- recognizing and building on the knowledge, skills, and experiences that learners bring to teaching contexts;
- identifying and catering for the varying needs, expectations, requirements, characteristics, and the idiosyncratic learning styles and circumstances of learners;
- aiming to develop skilled, mature learners who are responsible for their own learning; and
- allowing for the fact that tertiary students are generally well motivated but need quality information about the subject matter and intellectual property attached to the unit of study in which they are enrolled, the applicability of new ideas to practical contexts, and the gaps in current knowledge.

With a focus on assessment and evaluation, excellence in teaching involves:

- giving students timely, constructive, and informative feedback about their work;
- using consistent and transparent methods of assessing and rewarding achievement;
- using varied, timely evaluation of teaching and learning to inform ongoing improvement of course materials and pedagogical practices; and
- having a self-evaluative approach and openness to critique of teaching and its products.

Flexible education as response to quality concerns

A study commissioned by the then Federal Government Department of Education, Training and Youth Affairs (DETYA), identified seven domains of flexibility where it was possible to offer guided choice to the learners (Ling et al., 2001). These are as follows:

1. the time at which study occurs;
2. the pace at which the learning proceeds;
3. the place in which study is conducted;
4. the content that is studied, which includes the concept of flexible entry and exit points to a program;
5. the learning style adopted by the learner;
6. the form(s) of assessment employed; and
7. the option to collaborate with others or to learn independently.

It is not asserted that all forms of flexibility at all times will be beneficial for the quality of teaching and learning. There are both the possibilities and limits of designing flexible environments for enhancing the quality, satisfaction, efficiency, and accessibility of learning and teaching. Choosing these possibilities and recognizing the limits of flexibility is dependent on considering carefully teacher and learner needs, preferences, and circumstances (see further below). It clearly must relate to attributes of excellent teaching enabling quality learning for targeted student groups. A related concept to flexible education is that of blended learning, which brings more explicitly to the fore the role of information and communications technologies (ICT) in enabling flexible teaching and learning environments. Graham (2006) defines

[blended learning (BL) systems as a combination of] face-to-face instruction with computer-mediated instruction.... BL is part of the ongoing convergence of two archetypal learning environments. On the one hand, we have the traditional face-to-face learning environment that has been around for centuries. On the other hand, we have distributed learning environments that have begun to grow and expand in exponential ways as new technologies have expanded the possibilities for distributed communication and interaction. (Graham, 2006, p. 5)

Increasingly, universities are designing a range of blended learning environments with various degrees of face-to-face and ICT supported learning, using an increasing range of e-learning technologies, to afford opportunities for various educational benefits as related to the seven domains of flexibility outlined above. What is blended and how it is blended, associated with what is made flexible and how it is made flexible, requires professional judgement making at the institutional and individual levels.

Institutional context

From its inception as a single campus university, Deakin was conceived as a ‘dual-mode’ institution, servicing both traditional on-campus students and students studying by distance education (Jevons, 1982). Despite being formed from a number of antecedent institutions, Deakin is not a federated university — all principal academic and administrative functions are centralized and standardized, with the same programs of study and services being available to all students and staff, regardless of location (Calvert, 2001). The multi-campus-but-identical-program nature of Deakin’s academic programs means that it has a tradition of unit development by teams and a common presentation of the unit to all students that is also similar to distance-only institutions. Generally, off-campus students study the same syllabus, complete the same assessment, and sit the same examinations as on-campus students. In 2006, the total student enrolment at Deakin was 32,374 students, of which 35% (11,264) were off-campus students.

Over time, the nature of off-campus study has changed. Initially, Deakin’s off-campus students were predominantly distance students, who received study materials and studied primarily by themselves remotely. The introduction of computer/multimedia technology meant that greater levels of student interaction were possible with learning materials. The wide-scale availability of computer communication technology meant that off-campus students

could take part in computer-mediated communication forums open to all students. In fact, making educational technologies equally available to off-campus and on-campus students to use has helped to justify ever-expanding investments in online systems to this very day. The growth in part-time study, by both on- and off-campus students, and Deakin's partnering with other institutions internationally to deliver its programs 'off-shore,' led to the conception of 'flexible learning,' which is based on equivalency of syllabus and learning outcomes. Flexible learning emerged strongly in the mid-1990s as organizational vision, but delivered in the combination of modes best suited to the circumstances of the student. The pervasive growth in online systems has meant that in many areas 'distance education' has become synonymous with 'online learning' (Calvert, 2005). In 2003, Deakin sought to formalize and give even greater strategic direction to its growing use of online teaching and learning under a project entitled 'Deakin Online' (Corbitt, Holt & Segrave, 2006).

While elements of online delivery and interaction are now central to most Deakin off-campus programs, and all Deakin undergraduate students must complete at least one unit in their programs that is delivered wholly online, the postal delivery of print and other study materials still remains an essential element of most off-campus study at Deakin. The intermingling of online, on-campus, and off-campus education should not be seen as unique to Deakin in the Australian higher education system. However, the shift, nonetheless, has been pronounced in the case of the development of our own university. The move, therefore, to such an all-encompassing approach to flexible education can be seen in the context of four fundamental forces in the university's historical development, namely: (1) geographical expansion of operations; (2) growth of ICTs of benefit to all students; (3) increasing diversity of students; and (4) growing development and recognition of attributes of excellent teaching and what constitutes quality learning in higher education.

Contingency-based approach to designing flexible education

Clearly, teaching and learning happens in a wider context (e.g., internationalization and demands for lifelong learning), not in isolation. Approaches to teaching and learning need to be considered within some sort of framework if the design, development, and delivery of educational services are to be fully effective. Universities like Deakin are dedicated to exploring the meaning of teaching and learning. Academic and administrative staff members, both individually and in functional groups, are now expected to participate in defining and enacting Deakin's distinctive style as a quality, flexible education provider for undergraduate and postgraduate students, as well as those seeking professional development and advanced training. New challenges need to be met with reflective evaluations that may lead to new ways of doing things. A university is a complex institution. The design and conduct of teaching and learning needs to be responsive to the changing complex realities (i.e., it needs to be contingency-based).

Figure 1 takes these complexities and creates a contingency-based framework that places the practice of teaching and learning at its centre, surrounded by increasingly wider spheres of influence. Teaching and learning are contingent upon the core values to which the university is committed. These in turn are contingent upon a multitude of internal educational and organizational factors. The framework depicts a complex 'web' of interactions between factors and people which are useful to recognize and understand in relation to conceiving and enacting effective teaching and learning in particular settings. These factors go beyond immediate interconnected educational concerns relating to such elements as curriculum, pedagogy, assessment, student profiles, and teaching and learning contexts — complex enough in themselves — to encompass broader factors in the organizational and external environments. The contingency-based framework prompts us to recognize the range and levels of such factors operating in our design, development, and teaching environments.

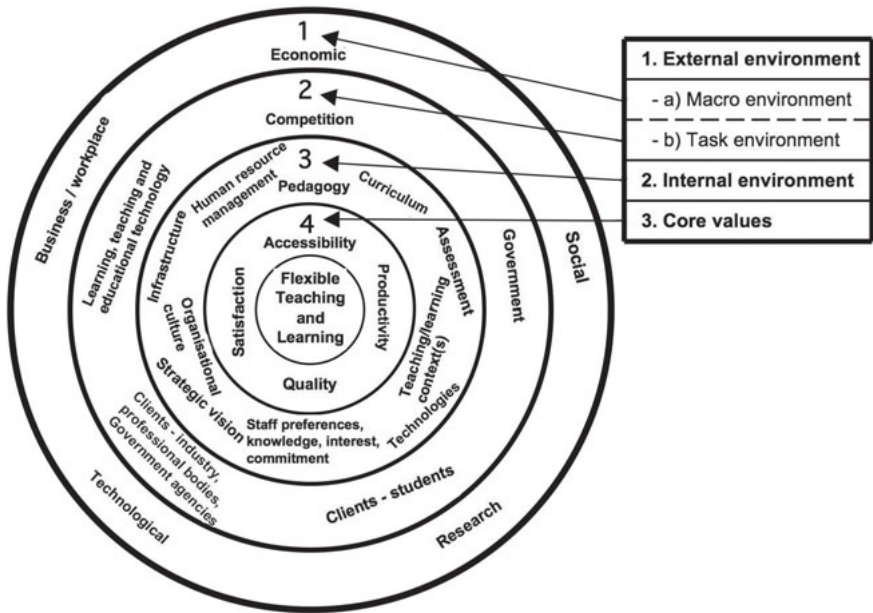


Figure 1. A Contingency-based framework for flexible teaching and learning.

Case study of flexible education in action at Deakin from engineering and technology

The possibilities, limits, and potential problems in designing flexible programs are best illustrated through a case study of flexible education in action in engineering and technology at Deakin. Flexible delivery of engineering and technology education is now an essential component of the engineering education scene, catering to significant numbers of students who cannot attend traditional, full-time, on-campus studies. In Australia the standard entry into professional engineering practice is via the completion of a four-year Bachelor of Engineering (BE) undergraduate course. The Deakin School of Engineering and Information Technology offers BE, Masters, and Doctoral engineering programs in flexible delivery mode. The undergraduate programs are delivered on-campus, full-time for conventional entry students. Mature-age students may study the programs off-campus and/or part-time. The programs are designed

to articulate with a range of national and international vocational, technical, and diploma-level engineering study programs. A formalized system of granting advanced standing into the course based on recognition of prior learning (RPL) and workplace experience has been developed that permits block credit of up to half of a Bachelor of Engineering degree (Lloyd, Baker & Briggs, 1996). While the Deakin Engineering programs are labelled as ‘flexible,’ the flexibility is principally in the place of study; because the course units are all available in off-campus mode, students can study at the place of their choosing, including interstate and internationally. The following sections explore some of main issues relating to ‘flexibility’ observed in the engineering program at Deakin.

Modular curriculum

Most flexible learning systems employ some form of modular curriculum, where the entire program, year level, semester or even unit/subject are organized into discrete, separable sections of content. Modularization offers the advantage of being able to customize a study program based on individual student needs and rearrange combinations of content into alternate units of study or new programs/courses, and it divides the content development task into smaller, more manageable chunks (Briggs, 1995).

Engineering accreditation bodies around the world are moving toward systems based on demonstrated graduate attributes and competencies, and away from systems based on rigidly prescribed course contents. This is likely to increase course flexibility and student choice in all study areas. Modularization does challenge the assumption about the importance of year-long integrated study programs, and it can lead to the compartmentalization of knowledge, rather than integration across the full curriculum.

As many engineering schools move toward an integrated curriculum and/or problem based learning strategies, there is a challenge to flexible, modular engineering programs to provide a high level of integration across their many, potentially isolated course

components. In an environment of modular study the hierarchy of unit prerequisites needs to be carefully designed and tested. At Deakin it is possible to find students enrolled in units from three year levels during the same semester. In such an environment, student cohorts fragment, with many students undertaking what is effectively an individual study program.

Recognition of prior learning

Recognition of prior learning (RPL) plays a central role in flexible teaching and learning. In engineering education it is an essential part of creating pathways for engineering associates and para-professionals to articulate to higher occupational categories. Where either block or unit-by-unit credit for prior learning may be granted, similar considerations to modularization regarding the student's study path and prerequisites need to be taken into account. Where advanced standing is granted, academic staff must be confident that the student possesses the required prerequisite knowledge for the balance of their study program, and that students will attain all the required attributes and skills by the completion of their studies. Under RPL schemes, it is common for mature-age students to be routinely exempted from a number of units (particularly those in the early years of the program) as advanced standing. 'Essential' course content should not be placed in units that are subject to exemption under RPL.

Flexible learning programs with RPL mean a significant proportion of students may be mature-age and may have many years of experience working in the engineering workforce, including extensive practical experience. It is not uncommon for mature-age students to possess more knowledge and practical experience than their academic counterpart in particular subject areas. Engineering students with practical experience of the 'real world' are more than happy to highlight deficiencies, simplifications, and other shortcomings in study materials. The maturity and practical experience of mature-age students need to be acknowledged and catered for; they are looking for knowledge and skills that will underpin

their current practice with theory, and that they can apply in their workplace. One approach to contextualizing the content of the course is to include assessable assignment tasks that require the student to use their own workplace as a case study for the analysis and application of the course content. For example, it is possible to ask students to identify the approaches/methodologies used by their organization in addressing issues and processes covered in the course. For on-campus students and those without workplace experience, an exercise in locating a relevant case study from the literature can provide the context for the analysis, as well as developing investigation and research skills.

Learning resources

The traditional distance learning resources are print-based study guides. Flexible learning materials take advantage of all available media, including face-to-face lectures for on-campus students and those off-campus students who can attend, print-based materials, video and audio recordings, home experimental kits, static and streamed electronic materials, residential sessions, computer programs and simulations, teleconferencing, synchronous and asynchronous electronic communication, and the Internet as an information source and material delivery medium. Flexible learning employs many new and traditional teaching technologies, and the pre-eminent consideration in the selection of a teaching technology must be its appropriateness for the task required. For instance, simply placing existing print-based study materials onto the Web ‘because you can,’ to ‘save money on printing notes,’ or because ‘someone else is doing it’ is not an effective use of the teaching potential of the Web. There are many advantages in converting course material to print, electronic, or other media. The course can be delivered to remote students who can study at the time of their choosing. Through the appropriate selection of a range of media, a range of learning experiences can be offered that replace, supplement, or enhance traditional on-campus teaching.

Two-way communication

The addition of flexible-study mode students to the class can pose difficulties and bring benefits. Many flexible study students are mature-age, with experience of the engineering workforce; this can be a valuable asset and a real-world contribution to class discussion. Many flexible mode students will study off-campus. Therefore, to avoid isolation ways must be found to bring them into the 'learning community' of the class (Rovai, 2002). One-way communication can occur with printed or electronic study materials, but more effective learning can occur where there are means for student—teacher and student—student communication. Telephone, fax, and e-mail communication can be very effective for point-to-point communication, and multi-point teleconferencing is possible. Developments in Internet-based, computer-mediated communication (CMC) have opened up new and rich opportunities for collaboration and communication at a distance (Davies & Graff, 2005). The general availability of Internet communications technology has seen the development of both asynchronous conferencing systems (such as newsgroups and bulletin boards) and synchronous conferencing systems (such as Internet Relay Chat and Web-based equivalents).

While it is desirable to have timely communication with off-campus students generally, it is very important that assignments are assessed and returned with meaningful feedback in the shortest time-frame possible. The issues of delay in returning assignments and brevity of written feedback are perhaps the two most common complaints of off-campus students. If the university has a central off-campus operations department that handles hardcopy assignment submissions and returns, then this may add several days to the turnaround time for assignments. As more university programs include online elements, it is not surprising that assessment, and in particular assignment submission and return, are to be found moving online. In addition to being part of the general move toward online delivery of education, a key reason cited for adopting

online submission and return of assignments is the decrease in the assessment turnaround time leading to the more timely provision of feedback to students (Palmer, 2005).

Another important form of two-way communication is reflective dialogue, with oneself and others. Effective use of reflection is an important element of the ongoing professional development of engineers. The use of a reflective learning journal (due to the requirement to transfer thought processes into words) is thought to be a valuable tool in developing 'reflexivity.' For the practising professional, the use of a work journal offers additional benefits — it may be an admissible legal document in the case of a dispute about the conduct of work, and it may be a valuable record of the conduct of project work. Collaborative reflective activity and the ability to compare one's own thinking with that of other learners may yield positive results and better facilitated learning than individual reflection alone. Online journals are one method for all students to participate in social reflective activities (Palmer, Holt & Bray, 2008).

Laboratory work

Engineering, by its nature, contains a significant practical element. The provision of satisfactory laboratory/practical experiences for off-campus engineering students requires novel solutions (Abdel-Salam, Kauffman & Crossman, 2006; Hall, Jones & Palmer, 2006; Lang et al., 2007; Weller & Hopgood, 1997). The flexible approach to laboratory work requirements at Deakin encompasses: exemption if the student can provide satisfactory evidence of relevant prior experience; development of home experimental kits for appropriate units, such as electronics and basic materials experiments; use of computer-based simulations in appropriate discipline areas, such as digital electronics and control theory; remotely controlled/Internet-based practicals that allow students to interact with real experimental equipment in real-time, often at a time of their choosing; provision of intensive, on-campus practical sessions for

several units at a time, delivered by the same staff/demonstrators who present practical sessions for on-campus students, normally timetabled on weekends, so off-campus students may travel, attend the university, and complete their practical requirements; and individual arrangements where the student negotiates to conduct the required laboratory work using the facilities of their workplace or another educational institution closer to them.

Accreditation

As with many professions, the institutions (professional and educational) that control the education of engineers are inherently conservative. For public safety and international mobility, there is an essential need to maintain the standard, and ensure equivalence of educational outcomes. However, institutional conservatism can lead to inflexibility in the face of social and societal change. The face and background of the ‘typical’ engineering student has changed dramatically. In many countries, interest from traditional secondary school students in engineering as a study and career option has waned, while demand from mature-age lifelong learners seeking to upgrade their trade, technical, or other qualifications and enter the professional sphere of the engineering workforce has increased. The increased diversity of engineering undergraduates challenges accepted models of professional formation premised on a uniform and particular type of preparation of candidates for engineering undergraduate studies.

Toward new flexible education models and practices

There is now a need to recognize that Deakin is not just an educational provider for one age/generation of learner studying predominantly in one particular context, but for many ages/generations of students, each with their own particular learning requirements. We now educate not just for the off-campus, mature-age student or the on-campus, school leaver group, but for a broad base of students

representing the new ages of learning across the life-span. The strategic positioning of Deakin University's quality teaching and learning agenda requires the re-integration of traditional classroom teaching, distance education, and online education in ways most appropriate to the needs of these different student cohorts. This now requires a renewed conception and set of practices around educational choice: choices available for staff and choices available for our students. In the wake of the massification of education and in the context of increasing technology options, a new emphasis on integration and choice while maintaining diversity will be achieved through new teaching/learning models, strategies, and behaviours. We see these models, strategies, and behaviours as constituting an institution-wide Learner Experience Design Framework focusing on diverse learning experiences and shaped by strong academic teaching agency. Educational choice needs to be situated in the context of Deakin's commitment to open and productive engagements: within and across its campuses; with its local, rural, regional, and international communities; and with its professional, governmental, and industry partnerships. It needs to be informed by a renewed commitment to the investigation and development of valued graduate attributes to the rapidly changing world of workplace and professional practice, and informed citizenship.

There can be no single model of quality teaching and learning for all student cohorts, and a response of merely adding the online model to conservative models of traditional classroom and distance education forestalls genuine renewal. A new, coherent teaching and learning framework is needed to achieve a set of defined benefits for defined student cohorts, so that their course experience is one of learning environments and teaching strategies that are relevant, innovative, and responsive. The defined benefits lie in the areas of creating more open, enriched, and active customized and personalized learning environments. A strategic frame of reference for creating differentiated, rich learning environments should guide and empower academic staff at the local

level to deal with their realities — the disciplines, levels, ages, locations, etc. of their known target market segments. It is the responsibility of academic authority empowered ‘locally’ to select the appropriate teaching strategies for different student cohorts — different education strategies to meet the needs of the market segments. This can be at all levels — Programs, Courses, Units — when evaluated, reviewed, revised, and re-accredited. Using appropriate learning experience design, the aim is to achieve fitness of purpose so that students realize the benefits. Policy must impact on students’ learning experiences of quality teaching and learning environment design at the grassroots level (the unit level, peer level / students’ individual ‘felt’ career trajectory level). Massification of education need not lead to a ‘sameness’ of teaching strategies.

Conclusion

Like many universities, Deakin needs to define, develop, and brand a new strategic niche for itself, building on the many strands of its past accomplishments in ways which will allow productive alignments with a broader range of organizations in pursuit of its mission and goals. In the Australian context, flexible education is seen as a key institutional response to the many expectations placed on the modern higher educational institution. The contingency-based framework (Figure 1) visually illustrates these various spheres of influence on flexible teaching and learning designs. Flexible education simply offers the opportunity to give students an individually tailored quality learning environment, while still allowing the institution to scale up its delivery. How this is successfully realized in practice is very much dependent on an intimate understanding of the program and its students. The particulars considered in the case study of teaching engineering and technology at Deakin demonstrate such a grassroots approach to designing a flexible program.

What is the future direction for flexible education? Deakin's distinctive profile and achievements relating to progressive forms of distance, open, online, and face-to-face education will need to merge with its myriad external relationships as supported by new technologies. The renewed commitment to educational choice, and the response to the diversity of learning needs and circumstances of its students, along with the university's various communities of engagement, will represent a new nexus between teaching and research within the university for the benefit of new age learning for all stakeholders. It will reflect a development path in common with other similar universities in Australian higher education. The full potentials and limits of flexibility in educational provision will be explored in the next stage of its historical evolution.

REFERENCES

- Abdel-Salam, T., Kauffman, P.J., & Crossman, G. (2006). Does the lack of hands-on experience in a remotely delivered laboratory course affect student learning? *European Journal of Engineering Education*, 31, 747–756.
- Briggs, H. (1995). Towards student-centred engineering education at Deakin University. Paper presented at the 12th Biennial Forum of the Open and Distance Learning Association of Australia, Vanuatu.
- Calvert, J. (2001). Deakin University: Going online at a dual mode university. *International Review of Research in Open and Distance Learning*, 1(2). Retrieved February 25, 2009 from: <http://www.irrodl.org/index.php/irrodl/article/view/20/52>.
- Calvert, J. (2005). Distance education at the crossroads. *Distance Education*, 26, 227–238.
- Corbitt, B., Holt, D., & Segrave, S. (2006). Strategic design for web-based teaching and learning: Making corporate technology systems work for the learning organisation. *International Journal of Web-Based Learning and Teaching Technologies*, 1(4), 15–35.
- Davies, J., & Graff, M. (2005). Performance in e-learning: Online participation and student grades. *British Journal of Educational Technology*, 36, 657–663.

- Graduate Careers Australia. (2007). Graduate course experience 2006 – The report of the course experience questionnaire. Melbourne: Graduate Careers Australia and Australian Council for Academic Research. Retrieved February 25, 2009 from: http://www.educ.utas.edu.au/TandL/TaskGroups/files/CEQ_2006Final272007.pdf
- Graham, C.R. (2006). Blended learning systems: Definition, current trends, and future directions. In C.J. Bonk & C.R. Graham (Eds.), *The handbook of blended learning global perspectives, local designs* (pp. 3–21). San Francisco: John Wiley & Sons.
- Hall, W., Jones, J.T., & Palmer, S. (2006). Providing a practical education for off-campus engineering students. *British Journal of Engineering Education*, 5, 49–57.
- Jevons, F.R. (1982). How different is the distance student? In J.S. Daniel & M.A. Stroud (Eds.), *Learning at a distance: A world perspective* (pp. 126–128). Edmonton: Athabasca University.
- Juran, J.M. (1988). The quality function. In J.M. Juran & F.M. Gryna (Eds.), *Juran's quality control handbook* (4th ed., pp. 2.1–2.13). New York: McGraw-Hill.
- Lang, D., Mengelkamp, C., Jäger, R.S., Geoffroy, D., Billaud, M., & Zimmer, T. (2007). Pedagogical evaluation of remote laboratories in eMerge project. *European Journal of Engineering Education*, 32, 57–72.
- Ling, P., Arger, G., Smallwood, H., Toomey, R., Kirkpatrick, D., & Barnard, I. (2001). The effectiveness of models of flexible provision of higher education – 01/9. Canberra: Department of Education, Training and Youth Affairs. Retrieved February 25, 2009 from: http://www.dest.gov.au/archive/highered/eippubs/eip01_9/eip01_9.pdf
- Lloyd, B., Baker, L., & Briggs, H. (1996). Off-campus articulated education in engineering at Deakin University for mature students. Paper presented at the 8th Annual Convention and Conference of the Australasian Association for Engineering Education, Sydney.
- Palmer, S. (2005). An evaluation of the use of on-line submission and return of assignments. *Journal of Educational Technology Systems*, 34, 57–67.
- Palmer, S., Holt, D., & Bray, S. (2008). The learning outcomes of an online reflective journal in engineering. Paper presented at the 25th Annual Conference of the Australasian Society for

- Computers in Learning in Tertiary Education, Melbourne.
Retrieved February 25, 2009 from: <http://www.ascilite.org.au/conferences/melbourne08/procs/palmer.pdf>
- Rovai, A. (2002). Building Sense of Community at a Distance. *International Review of Research in Open and Distance Learning*, 3(1). Retrieved February 25, 2009 from: <http://www.irrodl.org/index.php/irrodl/article/view/79/153>.
- Scott, G. (2006). Accessing the student voice — Using CEQuery to identify what retains students and promotes engagement in productive learning in Australian higher education. Barton, Australian Capital Territory: Department of Education, Science and Training. Retrieved February 2009 <http://www.dest.gov.au/NR/rdonlyres/9196224F-FEEA-4CF8-AEC7-4DB4AFFD41E5/10605/HEIPCEQueryFinalv21stFeb06.pdf>
- Weller, M.J., & Hopgood, A.A. (1997). Implementing a learning model for a practical subject in distance education. *European Journal of Engineering Education*, 22, 377–387.
- Wilson, K.L., Lissio, A., & Ramsden, P. (1997). The development, validation and application of the Course Experience Questionnaire. *Studies in Higher Education*, 22, 33–53.