EFFECTIVE CHANGE MANAGEMENT IN HIGHER EDUCATION

By Geoff Scott

"Good ideas with no ideas on how to implement them are wasted ideas."

—Michael Fullan

A powerful combination of change forces has been bearing down on higher education in recent years:

- *A rapid increase in competition.* This competition comes from colleges and universities within and beyond countries and from private providers.
- *A significant decrease in funding from government sources.* In a number of countries, this decrease is associated with two discernible and dramatic shifts in perception: (1) that education is not really a public good but a private benefit, and (2) that it is not really an investment but a cost.
- *Greater government scrutiny.* Australia, like many other countries, now has a national quality-assurance agency for higher education; trend data on performance is now in the public arena; and popular publications produce league tables on the performance of higher education institutions.
- *A growing consumer rights' movement.* As fees rise, students are increasingly prepared to complain about the quality of what is delivered and, in some countries, to engage in litigation.
- *The rapid spread of communications and information technology into every aspect of our lives, including education and training.* Whereas universities and colleges once held a monopoly on high-quality, up-to-date knowledge, this is now available (for a price) on the Internet from all manner of providers.

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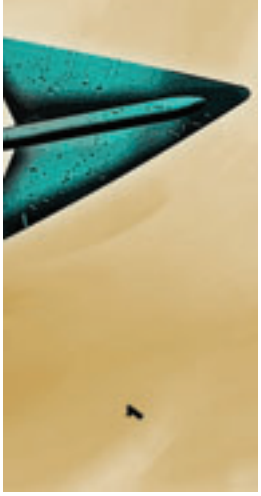

In combination, these change forces have brought many colleges and universities to a watershed. Some argue that if they don't respond appropriately, their very existence, at least in their present form, is threatened.

Yet such a situation is not necessarily a cause for despair—provided those of us in higher education get smarter about two things. These are identified in Michael Fullan's quote: "Good ideas with no ideas on how to implement them are wasted ideas."[1] What Fullan is saying is that if we are to successfully tackle the current situation, we have to get smarter at *both* the "what" of change (identifying change ideas that will really make a difference for students) and the "how" of change (making sure these ideas work in practice). In both cases, we now have many years of practical experience and research on which to draw.

> We have to get smarter at both the "what" of change and the "how" of change.

The "What" of Change: Identifying Good Ideas

Two developments have been put forward as the best way for higher education institutions to respond to the rapidly shifting context in which they find themselves:

1. Move into "flexible learning."
2. Use more "online learning."

But what do these concepts mean, and how do we know they are good ideas? I want to tackle these questions by looking at the available research on effective learning and teaching and at what the distinctive contribution of higher education in society should now be.

Australia's national Course Experience Questionnaire (CEQ) in higher education produces some 90,000 responses each year from graduates of Australia's thirty-eight universities.[2] Evidence from this detailed quantitative and qualitative analysis, along with twenty years of research in postsecondary education,[3] indicates that students respond best to learning programs that engage them in productive learning and that optimize their retention and outcomes. These high-quality learning programs share the following key characteristics:

- They are immediately *relevant* to the background, abilities, needs, and experiences of the students concerned and are delivered by staff who are accessible, responsive, up-to-date, and effective teachers.
- They provide more opportunities for *active* learning than they do for passive learning. In particular, they include frequent opportunities for students to work with each other and with people who are further down the same learning path and to actively search a range of relevant databases.
- They constantly link *theory with practice*, especially through the provision of guided practice-based learning opportunities, real-life learning, and work-placements.
- They effectively manage students' *expectations*, from the outset, about what level of service, support, and contact the students will be entitled to.
- They ensure that learning proceeds in *digestible* "chunks."
- They use a valid graduate *capability* profile to generate professionally and academically relevant assessment tasks. Learning designs specifically aimed at assisting students to successfully address these learning tasks are then developed. In this way relevant assessment, more than anything, drives learning.
- They provide students with opportunities to pursue flexible *learning pathways*. Although students are allowed greater flexibility and choice in the subjects undertaken, careful attention is given to ensuring that students still end up with the same spread and quality of capabilities at graduation.
- They ensure that feedback on *assessment* tasks is both timely and focused. Particular attention is given to identifying where students are performing well, where improvement is needed, and how such areas for enhancement might best be addressed.
- They not only include opportunities for *self-managed learning* but also actively coach students in how to undertake it.
- They provide *support and administrative services* that are responsive to students' needs and that specifically optimize a student's total college/university experience. This includes making access to learning times, locations, and resources as convenient as possible.
- They *acknowledge* prior learning and make provision for its recognition in both program delivery and program assessment.

Overall, what this research repeatedly indicates is that the most-effective learning programs have successfully engaged in a process of "reading and matching."[4] This process entails

- identifying the particular backgrounds, abilities, needs, and experiences (BANE) of each group of students,
- making explicit the relevant capabilities to be developed,
- checking on available resources, and then
- matching the optimum combination of assessment tasks, content, staff,

resources, learning times, locations, tools, and support systems to this "reading" of what is likely to be most beneficial and feasible.

In addition to taking into account research on what students find most useful in their learning programs, colleges and universities also need to develop greater clarity about what the key role of higher education should be in the current context and about the equity and access issues associated with any innovations attempted. For example, in recent debates on the reform of Australian education, it has been argued that colleges and universities should be about far more than just skills-training or knowledge-transmission. It has been suggested that their distinctive contribution should be in developing the creative, social, critical, and intellectual capital of the nation and that they should not seek simply to replicate the work of vocational-training providers.

Quality checkpoints and issues like those identified above should be applied to every proposal for change in learning programs, including proposals to scale up activity in the areas of flexible learning and online learning.

The Case of Flexible Learning

The creation of a more flexible and responsive learning environment has been a key development priority at the University of Technology, Sydney (UTS). As chair of the UTS Flexible Learning Task Force in the late 1990s, I was eager to ensure that how we approached this development was consistent with the learning research and concepts noted above. What has emerged entails far more than a commitment to what is popularly called "flexible delivery" (which, for many, seems to be synonymous with online learning) or to the creation of a "virtual university" (which is hardly flexible, since it replaces one comparatively rigid learning model with another). In fact, the approach that has been most successful in gaining and retaining students puts as much emphasis on the idea of being responsive (i.e., "reading and matching") as it does on the idea of being flexible in terms of student access, subject choice, and assessment.

What distinguishes the approach is its focus on *combining* increased responsiveness and flexibility in five key aspects of the student learning experience: (1) pathways, (2) design, (3) access, (4) assessment, and (5) support.

The Case of Online Learning

IT and online learning have a wide variety of potentially relevant applications in education. Research recently undertaken externally with more than one thousand principals, teachers, and trainers, consultancies with a range of overseas higher education systems, and internal research at UTS indicates that there are both more-powerful and much-less-powerful ways of using IT to enhance learning.

More-powerful uses of IT (with specific examples) include the following:

1. *Simulations:* engaging students in realistic representations of key workplace problems and dilemmas; enabling students to undertake tasks that, in real life, would be life-threatening; giving students the experience of what it is like to be in a high-level negotiation; getting students to work through a real-life case study and then comparing their strategies for handling it with what the actual players did; enabling students to design, test, experiment with, and enhance a range of creative products on-screen
2. *Interactive learning:* providing, all on one platform, links to staff, students, and "fellow travelers" in other locations, links to other Web sites, online library access, class announcements and FAQs, and assignment submission;[5] using a range of interactive CDs to develop students' diagnostic and problem-solving skills and to enable students in a variety of locations to engage in online debates; creating electronic learning networks for teachers addressing common areas of improvement or innovation in different locations
3. *Online information search-and-retrieval:* using searchable databases to identify and download relevant information in a range of professional areas[6]
4. *Active learning, practice, assessment, and coaching:* developing generic skills such as typing, language acquisition, or job-specific skills and producing a wide range of creative works and ideas[7]
5. *Electronic surveys, feedback, and processing:* setting up a student feedback system as a part of a course Web site
6. *Animations of otherwise invisible or hard-to-see processes:* demonstrating a range of microbiological processes
7. *Online self-assessment and testing:* providing opportunities for students to access previous exam questions or self-testing systems and to read sample answers online
8. *Online video with discussion:* using Webcam, online, or satellite applications for conferencing between countries (which can include a visual demonstration of a key product or process and can allow online Q&A, thereby avoiding the high travel, accommodation, and absence-from-the-workplace costs associated with face-to-face meetings)

The most-effective learning programs have successfully engaged in a process of "reading and matching."

IT is best viewed as just one set of learning tools among many.

9. *Audio tapes and video recordings:* providing audio-taped lectures for students to play while they are driving or undertaking routine chores
10. *Teleconferences:* enabling students who are engaged in a distance-education program to check that they are on the right track in undertaking a specific set of learning tasks

Less-powerful uses of IT include the following:

1. The provision of large amounts of digital information for on-screen reading or downloading
2. Infotainment
3. Unmediated Web discussions
4. Online learning that is not embedded in a broader learning system

The findings from a nationwide study of IT in Australian higher education indicate that even the most-powerful applications of IT can only complement a more-comprehensive approach to learning design.[8] This research suggests that IT is best viewed as just one set of learning tools among many, each of which may or may not add value to learning in a particular course and context. The art is, as always, to "read and match." For example, in a 2003 analysis of some 45,000 comments made across eleven Australian universities on the national CEQ, more than fifty quite different types of learning strategies and resources were identified as being in current use.[9] Studying this full range of learning options clearly locates IT as being part—but never all—of what can make learning relevant and effective.

Furthermore, recent research on the capabilities that distinguish effective graduates across a range of professions indicates that being able to work productively with a diverse range of people is critical to effective early-career performance and that a wide range of interpersonal experiences while attending school actively contributes to the development of this capability.[10] In the CEQ comments, graduates repeatedly highlighted the importance of the social components of their college/university experience, suggesting that a totally virtual experience would be limiting in this regard.

Also, as higher education institutions scale up use of IT in their learning programs, various equity and access issues are emerging.[11] It is clear, for example, that increasing the use of IT may very well further disadvantage the disadvantaged, in particular students from low socioeconomic-status backgrounds. For institutions with a strong commitment to equity groups, this creates a critical dilemma: how to optimize access for the disadvantaged, cater to the growing student demand for an increased use of IT, and still balance the budget.

It is particularly important to note how closely the more-powerful uses of IT align with the key characteristics of high-quality learning noted above. This is seen, for example, when IT is used for interactive learning rather than for the online delivery of digital information—or when it is used for active learning about real-life problems in simulations, for the production of creative works, in online debates, or for active experimentation and problem-solving with interactive CDs. Wasted time and disappointment can be avoided if all proposed applications of IT (or any other new learning strategy) are checked against an evidence-based set of quality learning checkpoints. In other words, it is important to sift out what is substantial about a claimed use from what is hype.

Let's assume for the moment that we have identified a good idea for learning enhancement in our college or university—specifically that, as UTS did five years ago, the institution has decided to develop a university-wide approach to interactive Web-based learning as part of a broader learning experience. What should be done to make sure that a good idea works in practice? This requires attention to the second part of Fullan's quote—to the lessons from research on effective change management in higher education.

The "How" of Change: Implementing Good Ideas

Taking what looks like a potentially relevant, desirable, and feasible change idea and making it work in practice is by far the hardest part of the quality-improvement and innovation process. The evidence and many practical tips on how to make a good idea actually work in ways that demonstrably benefit students are outlined and illustrated in detail in my book *Change Matters: Making a Difference in Education and Training*.[12]

It is this body of research that was consciously applied and refined as UTS sought to implement a more flexible and responsive learning environment and to scale up the use of the more-powerful IT applications identified above. Thus the themes and lessons below are generated as much from that practical experience with this specific innovation as they are from wider research, theory, and experience.

Recurring Change Themes

Three key insights underpin effective change management in the areas of flexible and online learning.

1. *Change is learning, and learning is change.* When a decision is made to change all or part of an educational program, those who are to deliver these changes will be faced with having to do something new. Each of these new

practices identifies a capability gap that the practitioners must learn. For example, to ensure that the rapid scale up in the use of the UTS online-learning platform was effective, lecturers had to learn not only how to set up their site but also how to use its interactive potential appropriately and efficiently. We know also that people will not engage in or stick with a change effort (i.e., a personal learning project) unless they see it as being relevant, desirable, and feasible for them to do so. It is motivation, therefore, that fuels both individual and organizational change (learning). Understanding how motivation operates is fundamental.

2. *There is a profound difference between "change" and "progress."* Whereas "change" involves something being made different or becoming different, "progress" involves a judgment that this change is moving in a desirable direction. Notions of what constitutes "progress" in education are, therefore, eminently value-laden and subjective. They are neither objective nor universal.
3. *Individual learning and organizational learning are inextricably linked.* The strategic development priorities of organizations can be achieved in practice only if the individuals responsible for their implementation are willing and enabled to learn how to do them. Conversely, as people adapt to day-to-day changes in their operating environment, they help create the material for organizational learning. This process is as true for an educational organization as it is for any other.

Key Change Lessons

Below are eight key change lessons identified from twenty years of research and experience in educational improvement and innovation. These lessons have been explicitly used to guide the strategic development of a more flexible and responsive learning environment at UTS.

Lesson One: There are far more options for improvement or innovation than there is time or resources to address them.

Therefore, it is essential that evidence-based priorities for improvement and innovation in teaching and learning are set. The task here is to identify only those changes that are most relevant, desirable, and feasible. This process is assisted by using well-developed professional networks strategically and by having in place a system that tracks the quality of implementation and the impact of specific courses, improvements, and innovations over time.

Lesson Two: Change is not an event but is a complex and subjective learning/unlearning process for all concerned.

Therefore, whenever a change priority is set, it is important to identify what staff see as being distinctive (different) for them in their daily practice. These capability "gaps" should form the basis for a needs-based, change-specific staff learning strategy. The responsive and flexible approach, identified earlier, for the design and delivery of student learning should be applied as well to the design and delivery of change-specific staff learning programs. A clear understanding of what motivates staff to engage in learning (change) is essential if they are to be adequately supported through the process.

Lesson Three: Enhancements in learning programs generate a need for improvements in the systems and infrastructure that underpin them.

Therefore, include in the action team for each change those administrative and support staff whose cooperation will be essential as implementation proceeds. For example, the scale-up of interactive Web-based learning at UTS required a wide range of parallel enhancements in IT systems, infrastructure, support, and monitoring. Opening up access to intensive winter and summer schools has implications for how quickly the results are processed for those subjects that are a prerequisite for the following semester.

Lesson Four: The most-successful changes are the result of a team effort in which the most-appropriate and best-positioned people are involved in a process of action learning.

Therefore, develop a positive and collaborative workplace and system culture; specifically, seek to identify the most-appropriate players for each change priority and explicitly support them to learn how to function effectively as a team. Recognize that collaborative cultures will not emerge spontaneously but must be coached and modeled. Recognize also that the extent to which a change effort succeeds and is sustained is always directly linked to the ongoing quality of relationships between those who have the job of putting the change into practice. Successful workplace cultures talk more about "why don't we?" and less about "why don't they?" The use of cross-functional Flexible Learning Action Groups (FLAGs) to drive the UTS change process in this area is an example of how this approach can be made to work in the context of a university-wide innovation.

Lesson Five: The change process is cyclical, not linear.

Therefore, accept the fact—as Francis Bacon said in the 1500s—that "we rise to great heights by a winding staircase." This means that effective change management not only should be team-based but also should follow good practice in workplace-action research. This entails the engagement of the team in an ongoing and rising spiral of design, implementation, tracking, and redesign of the desired improvement or innovation. It is a process in which the team concentrates on learning how best to make the desired change by working under controlled conditions, monitoring outcomes, enhancing the change, and then using what has been learned to coach others on how the change might be adapted for use in additional locations. This process has been applied successfully at UTS in the use of a FLAG on interactive Web-based learning.

Lesson Six: Change does not just happen—it must be led.

It is important to keep in mind, however, that managers are not the only important change leaders. In fact, everyone can be a leader of change in his or her own area of expertise. For example, in education, the most-crucial leaders of change are the teachers, because they are the final arbiters of whether or not a great-sounding change idea (such as the use of IT for interactive Web-based learning) is actually put into practice in a way that works for students. It is now clear that Emotional Intelligence (E.I.) and a "contingent" way of thinking are critical factors in change leadership, in addition to up-to-date skills and knowledge.[13]

Therefore, everyone needs to pay attention to research on effective change leadership. This now-robust research base should be used more explicitly to guide both recruitment processes and in-service leadership-development programs. Interestingly, the profile of the effective change leader is identical to that of the effective adult educator.

Lesson Seven: Change is a mix of external forces and individual action.

Therefore, accept that not all change is voluntary and that, as the Chinese proverb says, "the river we put our foot into today is not the river we put our foot into tomorrow." Because of this, it is important to work collaboratively in choosing which waves of change to take up and which to let pass through. It is equally important to keep an eye on the future (on the waves of change that are approaching from over the horizon), as well as on the present. In an attempt to do this, for example, in 1996 the chair of the UTS Flexible Learning Task Force visited twenty-six overseas institutions known to be successfully addressing flexible and online learning aspects that were expected to become more prevalent over the subsequent decade.

Lesson Eight: We must look outside as well as inside for viable change ideas and solutions.

Therefore, actively develop key, strategic networks; listen also to what staff from within the organization say, but avoid the temptation to "group-think." Develop "benchmarking for improvement" projects with like organizations that have the same change priorities, and develop mutually beneficial and complementary educational partnerships with relevant public and private instrumentalities

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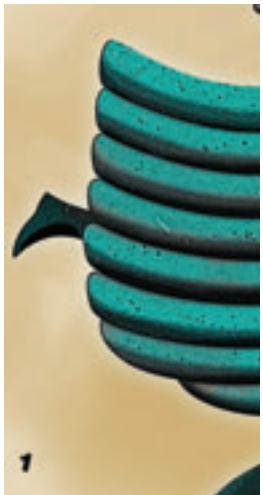

in order to engage in joint-action research and learning in these priority improvement areas. For example, a number of highly successful flexible learning programs at UTS also work in partnership with key organizations on jointly managed work-based learning programs in which IT assists ongoing contacts between staff, students, and workplace supervisors across a range of sites.

In general terms, therefore, it is important to recognize that simply having a good idea for an educational improvement (e.g., an idea on how to use one of the more-powerful applications of IT for learning, or a commitment to create a more flexible and responsive learning environment) will not, of itself, make the change happen. Putting a good idea into practice requires that those responsible for its successful implementation learn how to apply the eight change lessons above in unique ways that suit each specific change and context. This in turn entails learning how to balance the use of apparently paradoxical approaches: looking both inside and outside for change solutions; using both top-down and bottom-up strategies; ensuring there is both stability and change; allowing for both pan-institutional and local changes; combining both clear direction and flexibility; and listening to both resistors and enthusiasts.

Finally, it is important to avoid getting caught up in the following change-management myths:

- *The consensual myth.* "Look, we've all agreed that putting our lecture notes up on the Web is a good idea, so that's what we're going to do!" (See change lesson one.)
- *The change-event myth.* "Well, the hard work is done, we've got the new flexible learning course approved, now all you have to do is implement it." (See change lesson two.)
- *The silver-bullet myth.* "Just follow this five-step method to successful change, and all will be well." (See change lesson two.)
- *The brute-logic myth.* "I've told them three times now, and they still can't see that using these interactive CDs in their course will make it much more exciting." Or, as George Bernard Shaw put it: "Reformers have the misplaced notion that change is achieved by brute logic." (See change lesson two.)
- *The linear myth.* "It's easy: we'll get the online course approved, get the infrastructure in place, train the staff, and it'll be working by next semester." (See change lesson five.)
- *The knight-on-the-white-charger myth.* "Now that we've got a better dean, this faculty will really take off in the area of online learning." (See change lesson six.)
- *The either/or myth.* "There's nothing I can do—I'm a victim of forces beyond my control." (See change lessons seven and eight.)

Distinguishing between on- and off-site learning may no longer be helpful to higher education, if it ever was.

Some Emerging Issues

Distinguishing between on- and off-site learning may no longer be helpful to higher education, if it ever was. Instead, as the notion of "reading and matching" suggests, the important issue is to identify what mix of learning times, locations, modes, and content best matches students' BANE, the capabilities required, and the available resources. For example, we now know that many on-site students find the self-managed learning materials and techniques that are traditionally associated with distance-education programs just as useful as do those students learning off-campus.

Quality is not just about giving students what they want (a sort of "TV ratings" approach to higher education). Responsiveness to students must be balanced against the capabilities they will need to be successful in their chosen profession or discipline. These capabilities can be determined only by working with experienced professionals, successful graduates, employers, professional bodies, and clients. And there are some courses that are so contrary to the fundamental values of the institution that they should not be offered even if they can turn a handsome profit. For example, some institutions would be troubled by accepting a lucrative contract to train staff in the use of pesticides known to cause fetal abnormalities. Similarly, there are some learning tools (e.g., particular applications of IT) that should not be used if they will further disadvantage the disadvantaged.

Flexible learning is about far more than flexible delivery. It is as much about what has always been necessary for good teaching and learning—being responsive and contingent—as it is about anything else. Therefore, truly flexible learning requires attention to far more than online learning, which is just one option among dozens of learning approaches that may or may not add value in the unique context of a particular course.

Online learning is best used for interactivity and active learning—not simply for the passive reception of large amounts of digital information. Receiving information is not learning. Furthermore, the research discussed above indicates that

online learning cannot replace a more complex and responsive approach to learning design and delivery. As a consequence, it may be that the productive use of IT will not save money, despite some higher education administrators' hopes, in the late 1990s, that it would. In fact, where IT is being used in ways that actively assist learners, there are indications that this use might actually be adding to the costs of learning.[14] To put this issue to rest, however, comprehensive studies of the full cost-benefit of using various modes of IT as part of a range of broader learning designs are necessary—a task that is exceptionally complex.[15]

Lastly, the question remains: If private online providers are just as capable of delivering high-quality online information as colleges and universities, and if public and private training providers are better suited to the development of practical vocational skills and knowledge than colleges and universities, what exactly is the distinctive role of higher education in the current environment?

Conclusion

There is little doubt that higher education—in every sector—is currently facing a powerful combination of pressures for change. The call for colleges and universities to increase their use of IT for learning and to become "more flexible" is part of this context, even though what these ideas might mean in operational terms still remains hazy for many.

I have argued that higher education has little choice but to face the powerful pressures for educational reform head-on but that it should do so in an informed and strategic fashion. The best way to do this is to get a much sharper picture of both the "what" of change (identifying good ideas) and the "how" of change (implementing those ideas). I believe that our skill in successfully combining the "what" and the "how" of change will be most telling in the coming five years, especially in public education. This will be particularly true for the way in which we respond to the call for a rapid scale-up in the use of online learning and other applications of IT and to the call for greater flexibility and responsiveness in the design and delivery of our programs in an increasingly accountable, competitive, and scrutinized environment. *e*

Notes

1. M. Fullan, *The Meaning of Educational Change* (Toronto: Ontario Institute for Studies in Education, 1982). For details of Fullan's work, see <http://www.michaelfullan.ca/>.
2. See G. Scott and A. Richardson, *IT-Supported Analysis of Qualitative Data from the Course Experience*

Questionnaire (Canberra: Department of Education, Science, and Training, Australian Government Publishing Service, forthcoming).

3. See, for example, G. Foley, ed., *Understanding Adult Education and Training,* 2d ed. (St. Leonards, NSW: Allen & Unwin, 2000); the National Education Association's (March 2000) benchmarks on quality approaches to distance education; and guidelines produced by the Joint Task Force on Student Learning, *Powerful Partnerships: A Shared Responsibility for Learning* (1998), <http://www.aahe.org/assessment/joint.htm>.
4. This concept is not new. The notion was first put forward by the U.S. educational psychologist David Hunt in the 1950s after extensive study of the most successful learning programs in schools.
5. As at many other institutions, the number of students registered on the UTS online learning platform—*UTS Online* (http://online.uts.edu.au/?bbatt=Y)—grew rapidly in the late 1990s and into the early years of the twenty-first century. At present the system caters to more than 500 subjects and 22,000 student registrations with less than 1 percent downtime. The application has recently been extensively evaluated by the university's Institute for Interactive Multimedia & Learning, under the directorship of Professor Shirley Alexander.
6. A good example is the Australasian Legal Information Institute (AustLII) Web site (http://www.austlii.edu.au/). This site is fully searchable and provides access to commonwealth, state, and territory legislation, court decisions, and other legal materials, as well as links to quality sites overseas.
7. Interesting examples of how active learning and interactive learning online are being combined can be seen in the production of an online student newspaper (http://ink.news.com.au/) and in the Tumblong Web site, an international online art creation and discussion project (http://www.tumblong.uts.edu.au/).
8. S. Alexander and J. McKenzie, with H. Geissinger, *An Evaluation of Information Technology Projects for University Learning* (Canberra: Committee for University Teaching and Staff Development, 1998).
9. These strategies and resources included the following: traditional higher education methods (e.g., lectures, tutorials); dozens of other face-to-face methods (e.g., debates, panels, workshops, buzz groups, team projects); a wide range of independent, guided-study techniques; extensive work and real-world practice as a site and source for learning; a variety of active experiment and simulation strategies (e.g., lab work and mock trials); and IT-enabled learning strategies like those outlined above. For further details, see Scott and Richardson, *IT-Supported Analysis of Qualitative Data.*
10. This research has been undertaken in many professions. For an example of the findings in relation to engineering, see G. Scott and W. Yates, "Using Successful Graduates to Improve Undergraduate Education," *European Journal of Engineering Education* 27, no. 4 (December 2002): 363–78.
11. See L. E. Gladieux and W. S. Swail, *The Virtual University and Educational Opportunity: Issues of Equity and Access for the Next Generation* (Washington, D.C.: The College Board, 1999); J. Barraket, G. Scott, and A. Payne, *Equity and the Effective Use of CIT in Higher Education* (Canberra: DETYA, Australian Government Printing Service, 2000); J. Barraket and G. Scott, "Virtual Equality? Equity and the Use of IT in Higher Education," *Australian Academic and Research Libraries* 32, no. 3 (September 2001).
12. G. Scott, *Change Matters: Making a Difference in Education and Training* (St. Leonards, NSW: Allen & Unwin, 1999).
13. See, for example, G. Scott, "Learning Principals: Leadership Capability and Learning Research in New South Wales Department of Education and Training" (March 2003), <http://www.curriculumsupport.nsw.edu.au/leadership/docs/Learning_principalsnewb.pdf>.
14. Costing issues like those above were explored by C. Frances, R. Pumerantz, and J. Caplan in "Planning for Instructional Technology," *Change* (July 1999), 25–33. The authors reported finding real limitations to the cost savings anticipated through economies of scale. For example, they found that students still wanted the same levels of staff interaction—whether it be by phone, online, or e-mail—as they have in more traditional, face-to-face learning modes.
15. Some of the costing areas include the following: initial hardware, infrastructure, and software; recurrent maintenance and upgrading of hardware, infrastructure, and software; development of the learning system and content to be used online; opportunity costs for staff involved in content development; payment for and training of technical-support and educational-support staff; opportunity costs for staff participating in staff-development programs; costs to keep sites up-to-date; costs to students having to buy equipment and online access in order to use the system; comparative loss of income due to higher dropout rates from purely distance-learning modes; and costs associated with access to digital libraries.