Chapter 13
Institutional Considerations: A Vision for Distance Education

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Introduction

Every morning in Africa,
A gazelle wakes up;
It knows it must outrun the fastest lion,
Or it will be killed.
Every morning in Africa,
A lion wakes up;
It knows it must outrun the slowest gazelle,
Or it will starve.
It does not matter if you are a lion or a gazelle,
When the sun comes up,
We'd better be running.

This little scenario, uttered by Alfredo de los Santos, depicts our dilemma; to survive we must compete, we must run, and, in the process, we must change.

Human nature instinctively resists change. Whether it is a new idea, a new artifact, or a new procedure, the potential loss of familiarity, the loss of control and power, or different ways of doing

familiar things all contribute to resistance. For the most part, faculty are no exception and often remain entrenched in a culture utterly resistant to change (Boschmann, 2003a). In Chapter 3 we caught a glimpse of this entrenchment and the importance of strategies to effect and lead change within instructional design teams.

Most developments struggle for acceptance, as did electricity, the car, and radio in the late nineteenth century. More recently, the computer, gender equality, and teaching at a distance also struggle, not only having to answer critics, but having to convince the neutral masses as well. But when such developments are successfully accepted, they obviously have embraced change, widened their influence, and removed barriers. Thus, when students of the Greek philosophers began using papyrus to record the lectures, their teachers objected on the grounds that it would destroy the art of oratory. However, besides providing a means for later review, these notes also made lectures available to those who could not attend. They widened the circle of influence.

It is the premise of this essay that a revolution is at hand and that capitalizing on its promises can bring about sweeping changes not only to education, but by extension, to the world economy. In fact, if exploited properly, this revolution can affect more people world-wide than virtually any other transformation.

While the learner is always central to any discussion, this chapter will consider fundamental concerns that we share from the larger perspective of the academy, the institution, and even society itself. The previous chapters have dealt mostly with the "how" of DE in general and with respect to the sciences. This chapter now also touches on the "why." We will first look at the barriers to distance education, both formal and informal, and the vision necessary to overcome these barriers. Next we will look at various opportunities that distance education affords, especially with the enormous capabilities of information technology. Finally, we must consider the barriers yet to be overcome.

Barriers

As humans advance, develop, and call for change, barriers are always in place. Thousands of years ago the culture of India developed a unique educational technique. A guru hand-picked children to live with him, and he moulded them in totality; morals, ethics, values, reading, and writing. These were wonderful opportunities for the few chosen ones, but excluded most children. For millennia the tribal storyteller in the Americas provided the only means of education. The tradition of the apprentice in Europe who wandered the country stopping to learn his chosen trade from the masters he encountered has similar elements. While they provided the best education for the time, these examples are also rife with barriers of elitism, gender, time, and distance.

Similarly, prior to the invention of the printing press, the professor came into the classroom with 'the book,' read (lectured) from it to the class and held on to his privileged prerogative of control of knowledge. Aside from barriers such as time and place, that system also imposed the barrier of insisting on just one learning style: auditory. The availability of mass-produced books had the potential to influence many students, yet it took a century after the invention of the printing press for the book to have a significant influence on education — due to two barriers: most people could not read and there was no system of mass distribution of the book.

The creation of residential schools, primarily for the social edification of rich, elite, white, young gentlemen, was utterly exclusionary. What barriers! The subsequent emergence of public colleges and universities institutionalized higher learning, but still discriminated in favor of the elite upper classes. The democratization of higher education, especially in the United States through the development of the land grant institutions, the post-war enrolment surge, and the expansion of state universities and the community college system, broke down a number of barriers and opened the halls of learning to the masses. But with this rapid expansion new

barriers were created: the increased isolation of the student from the master, and the 'delivering' of knowledge, rather than engaging the student in the pursuit of knowledge. Yet not only was education made available to the masses, but many other existing barriers were removed or at least reduced: cost, gender, religion, and race. Similarly, the introduction of the blackboard in the 1850s, as with the emergence of any new technology, was hailed as the harbinger of an educational breakthrough: it introduced the promise of a new visual learning style. As time goes on, barriers are removed and often new ones appear. With the exception of a brief mention in Chapters 11 and 12, the topic of barriers to learning has not yet been explicitly articulated in this book. We look at it now, because it is at the heart of why we might choose alternative approaches to teaching and learning.

What follows is a list of barriers which is not meant to be exhaustive or detailed in description.

Cost and access

The relative ease of economic accessibility to education in industrialized countries is not the norm throughout the rest of the world. On a global scale, tuition increases much faster than family income does. The same thing is true with physical access to a campus: global population increases at a much faster rate than does the increase of new campuses (see Daniel, 1997).

Gender

The bias against women in school is well on its way of being eliminated in the industrialized countries; however, it remains a reality in much of the world. While we think it illegal to engage in such discrimination, it is part of the culture and tradition in many countries. Perhaps it is not overt discrimination, but a rather informal way of discouraging women by not having many female faculty members and administrators, by counseling women into just a few areas of study, or by having few toilets for women.

Religion and race
Again, while the Western world has essentially eliminated such discrimination, there remain countries where a quota system is established to safeguard both a religious and racial imbalance.

While many of the barriers mentioned above have been eliminated in industrialized nations, some barriers remain in all societies.

Age
To be in a class as one whose age is far out of range from the average age of fellow students may be intimidating to some; others may sense a real bias against them.

Family and work
Seeking re-education while at the same time carrying the responsibility of a family and work becomes a barrier when institutions do not make allowances for such obstacles.

First generation student
Students who come from families without a higher education tradition can experience barriers in both the lack of understanding by family members for the need for higher education and the lack of moral and academic support from them.

Terms and length of study
Many institutions continue to place their own needs before those of the students. Thus, setting the beginning and ending of terms is a carry-over from the farm days when harvest demanded that students be at home during the summers. Then they accommodated students, today they do not. Similarly, students' varying abilities are ignored when the length of study is prescribed and their personal schedules are ignored when starting times are set by the institution.

Learning styles
Few professors are trained to teach according to the varying learning styles of students. Instead, professors generally teach as they were taught, expecting students to learn by the auditory, and/or visual method — and the faculty member decides which is used when.

The medium is the message
Marshall McLuhan (1964) in his book entitled *Understanding Media: The Extensions of Man*, discussed how technology affects human beings and their relations to one another. Any extension, be it a gun or e-mail, amputates other human abilities, such as archery and penmanship. With his phrase that "the medium is the message" he said we become what we behold. This can be a barrier unless we make sure that the medium *serves* the message.

Entrance requirements
It is a matter of discrimination when someone who wishes to enter an institution cannot due to prerequisites which the person chose not to or could not obtain earlier in life. Schools must consider accepting such students, although proper performance should be expected once in school.

Academic culture
Human interactions, especially in the business world, change frequently in response to changing environments. Half a century ago grocery stores were staffed by clerks who filled orders from behind a counter. As society became more demanding and insisted on self-selection, self-service stores arose. Most institutions are very slow in responding to changing times, even when their own research points toward new directions. For instance, why does so much teaching still 'deliver' knowledge when all research shows that the student needs to be 'engaged' for there to be a true and lasting positive impact on learning? (See Opportunities.)

Lack of vision

There are other barriers, not the least of which is lack of vision. The overhead projector was invented in 1876; by the 1930s it began to be used in bowling alleys, but it was not until the 1960s — 80+ years after its invention — that it began to appear in the classroom.

Not so long ago, when 80–90% of us worked on farms, we laboured with our hands and were assisted by our minds; today the reverse is true. It is a fact that as the industrial revolution gives way to the electronic revolution, education becomes a global necessity since the work of the mind becomes increasingly important. Those who accept and manage this change will not only be successful in helping fellow citizens, but will also help in overcoming barriers.

It is the vision of this chapter that these obstacles can be overcome.

In his book *An Agenda for the 21st Century*, Rushworth Kidder (1987) and a team of thinkers considered the challenges for the twenty-first century. After much discussion they listed overpopulation, the increasing gap between haves and have-nots, the arms race, nuclear annihilation, destruction of the environment, and decay of public morality as top challenges. However, these six challenges can all be overcome, according to Kidder, if the seventh one is addressed properly: namely, education.

If education is the key, then how can we approach the challenge of properly educating the masses? There are two very helpful phenomena that will be of paramount importance in the task: the existence of global unifying factors and the multipliers of human capabilities.

Centuries ago, when people lived in isolated communities with very little travel from place to place, when self-sufficiency was completely dependent on local resources, when local costumes and traditions defined and remained in the community, global unifying factors were both unheard of and unnecessary. However, since those days our global melting pot has brought about much unification. Developments such as a common system of weights and measures,

the metric system, common clothing styles, uniform musical notation, the use of electricity, radio, and television, a common computer language, and acceptance of English as an official language of communication all make it possible to go from country to country and fit right in. Such unifying factors have smoothed the path to addressing the need for mass education.

The second happening is the introduction of multipliers of human capabilities. Robert Dierker (1995) cites Vinod Chachra, who amplified an idea outlined by William McKeefrey that the impact of a given technology can be quantified by determining the extent to which that technology multiplies human capabilities of accomplishing a given task. Thus, compared to walking, the horse produced a 2-fold increase in capability, the car a 15-fold increase, and the jet airplane a 150-fold increase. The plow and fertilizer each produced a 10-fold increase, thus ushering in the agricultural revolution, just as the steam engine with its 1000-fold increase in human capability ushered in the industrial revolution. According to Chachra, the telegraph, radio, and computers each have achieved a million-fold increase in human capability and thus have ushered in the electronic revolution.

Therefore, with the advent of unifying factors and multipliers of human capabilities, there are now opportunities that provide a dramatic impact on education and learning.

Opportunities

Peter Drucker (1992) predicted that in the next 50 years, "schools and universities will change more drastically than they have since they assumed their present form 300 years ago when they organized themselves around the printed book." Much as the agricultural and industrial revolutions made quantum leaps of progress in their fields, so the electronic revolution can bring about a huge increase in human capabilities of educating the masses. We have the opportunity to create a student-centred environment where

the student picks the most appropriate learning style, chooses a convenient time frame, and has no worries about access. This revamped and scaled-up educational system can take a great lesson from the business world, where mass production no longer means low quality, but instead, produces consistently high-quality products — at very low cost.

Personal attention

The electronic revolution holds the promise of educating the masses while at the same time providing individualized attention" The late Ernest L. Boyer, former President of the Carnegie Foundation for the Advancement of Teaching, used to tell of an incident when he visited a school for handicapped children working with computers. When he noticed a boy sitting in front of his computer in tears he walked up to him to inquire. The boy just pointed to the computer screen and said, "It is the first time anybody ever told me I did something right." When Boyer looked at the screen it said: "Terrific job, Johnny, you got it right!"

Both reach and richness are possible because information technology allows learning for all to be highly interactive, individualized, and adaptable. It can foster peer communication and group learning, and provide a mechanism for increased student-teacher interaction and feedback. (More detailed discussion around student interactions can be found in Chapters 1 and 2.)

Access

For millennia students had to go to the source of knowledge, but now, information technology allows knowledge to come to the student. Correspondence courses, used since Biblical times, peaked during the century prior to the 1950s (Daniel, 2005). And many lives have been transformed, especially in South Africa, through the use of radio courses (Naidoo & Potter, 2007). However, the element of interactivity is lacking and can only be present for the masses with information technology. India is currently the world

leader in open and distance learning; with China certainly coming next. Today students are more in the presence of Bach and Mozart than anyone in the eighteenth century ever could have been. And students can use computers to study the details of gas laws by varying the parameters of volume, pressure, temperature, amount and kind of gas, and particle speed, without ever leaving their home — and they can do it at no cost. Information technology is quick, student-centred, completely safe, repeatable, and cost-free! It allows knowledge to come to the student!

Flexibility

Correspondence courses had wonderful flexibility never achieved by traditional institutions. While there were some guidelines for length of study and ending times, the student had considerable say-so in these decisions. But the student had no opportunity for flexible learning, such as a combination of face-to-face and information technology tools. What if the student does not have the required prerequisites? Can that student enrol?

Students today can choose the place, the length of study (to some extent), and the beginning and ending time of study, as well as the level of interactivity with other students and the faculty member. In fact, students can enrol even without the necessary prerequisites, as long as the course performance is acceptable. For science laboratories there are, however, serious challenges as to how and where practical work is performed. Pioneering work is being done with a blended approach using laboratory kits sent to the student (see, for example, Chapters 5 and 7), video/DVD prepared experiments, and very excellent Internet experiments, with the student being responsible for all data collection and reports (see Boschmann, 2003b).

Worldwide distribution

More than any other area of knowledge, appreciation and understanding of science lags far behind its development. Perhaps this is

due to its mathematical nature, perhaps because the advance of science depends on experimentation and laboratories are out of reach for many persons, perhaps it is lack of interest, or perhaps scientists are to blame for making the fields unnecessarily obscure.

Science literacy can be improved dramatically by taking a radically different approach. In addition to classes, lectures, textbooks, laboratories, conferences, and seminars, the reach can be increased manifold through films, museums, or the Web. Celia Henry Arnaud (2007) writes of hosting videos on *YouTube* that are audience-participatory and go a long way toward inquiry-based science education. Such videos must be short and to the point, they must be entertaining, and the audience must have the opportunity to choose from an array of options.

Science publications made available through open access for all and for free not only improve visibility, but also speed distribution of findings, and often lead to worldwide collaborations. Some disciplines are already making great strides with open access publications.

Drug companies faced with tough research problems post these on the Web with an invitation to submit proposed approaches to solving them. This open competition in resolving stubborn problems not only receives instant worldwide distribution, but gives clever researchers everywhere the chance to solve a given problem and earn some money.

The time-honoured procedure of faculty having their publications peer reviewed, and if approved, published, may now be reversed, in that the article is first published on the Web, and then peer reviewed. Publications receive a much higher readership, honest feedback from a much larger set of colleagues, and can always be revised based on that feedback.

Learning styles and engagement

Students learn differently. Some are visual, some auditory, some tactile, some prefer a blended approach, and some learn most when in

the laboratory. While it is difficult for faculty to adjust to all these styles in one class, research has shown that the vast majority of students, by far, learn most when they are engaged with the material instead of the material being delivered to them. The emphasis is on student involvement, active learning, and engagement. Some quotes from the foremost thinkers on learning will make the point:

"...the most apparent need is to change the emphasis of instruction away from transmitting fixed bodies of information toward preparing students to engage..."
- Derek Bok (1986)

"Simply put, the greater the student's involvement in academic work, the greater his or her level of knowledge acquisition..."
- Pascarella and Terenzini (1991)

"...good practice encourages active learning..."
- Chickering and Gamson (1987)

"Since the 1920s, hundreds of studies point to the advantages of active learning. These findings are deemed 'the most distinguished of all'."
- David and Roger Johnson (1992)

"...the greater the student's involvement, the greater the learning and personal development."
- Alexander Astin (1996)

In the electronic revolution, technology provides a great additional tool in fostering such student engagement.

As with other teaching tools, there are two kinds of technologies: delivery technologies are those that substitute for lectures, books, and notes, such as videos, TV, CD-ROMs, etc., where the student generally remains in the passive role. All studies indicate that, in general, there is no significant difference in student learning whether or not this technology is used (see, for instance, Schramm, 1977).

However, engagement technologies such as the Web, e-mail, interactive computer programs, chat rooms, etc., improve student learning dramatically, as many researchers have found (see Kulik & Kulik, 1991). These tools remain static until the student participates. On Bloom's taxonomy (1984), most lectures, TV, videos, and CD-ROMs emphasize the lower end of his scale: knowledge, comprehension, and application; whereas at the higher end of the scale, analysis, synthesis, and evaluation are fostered by problem-based learning, apprenticeships, collaborative learning, and interactive computer programs, chat rooms, the Web, e-mail, etc.

Thus, a student could take an entire course in a traditional class, watching television, a DVD, or a CD-ROM and remain totally passive, simply taking notes. However, in a chat room, using an interactive DVD where no action takes place unless the student first acts, or in deciding how to set up virtual laboratory equipment, the student has no choice but to be engaged. Assessing the online learner will become a major thrust (Palloff & Pratt, 2008).

Student-centredness

There is a major shift under way from the passive student to one who is actively engaged, controls the destiny of study and seeks out opportunities for advancement. The passive student will fade, as the apprenticeships and correspondence courses have, because something much better is on the horizon. Hierarchical control will give way to collaborative support, and authority will become a shared responsibility between the student and the master.

Affordability

Just as computer storage capability doubles every 18 months, so equipment prices are cut as time goes on. It is no longer surprising to find computers in the US$100 range or wireless capabilities in many environments. Tuition still rises from year to year; however, many open source course materials are now available. Herein resides the real opportunity for third world countries: the

digital divide can be narrowed quickly and considerably with lower cost equipment and open source course materials. It will take another generation or so for traditional institutions to make the radical change from gatekeepers of knowledge to open access educators.

Barriers yet to be overcome

The barriers and opportunities mentioned above, and the barriers yet to be overcome mentioned in this section pertain to traditional institutions; however, many barriers have been overcome by the creation of a few very special institutions. For example, the *Open University*, created in 1969, is today the UK's largest university. It provides distance education which is open to people, places, methods, and ideas and promotes educational opportunities and social justice for all. *Athabasca University*, Canada's leader in distance education, is committed to breaking down barriers of time, space, access, and success by acknowledging prior learning and providing opportunities for anyone over the age of 16. *Monash University* in Australia seeks to improve the human condition by advancing creativity in social justice, human rights, and a sustainable environment. These and other similar open institutions around the world have pioneered recognition for prior learning, and introduced tutorials, trainers, and assessors to overcome some of the barriers endemic in many traditional institutions of higher education. However, for many traditional institutions barriers do remain.

Academic culture

Like any other institution, after centuries of tradition, academia is entrenched in its ways and struggles with change. How shall it respond to the electronic revolution? If terms of study are no longer necessary, then what is expected? What about courses *vs.* modules, student-paced competencies, or collaborative learning?

Is assessment the right route? Should collaborative learning be encouraged? Are employers true partners in these decisions? What about tuition for foreign students? Should credit be given for life experiences? How does one overcome the not-so-occasional depiction of distance education (DE) as second-rate, as just extension centre courses, or, worse, as a "diploma mill?"

What does faculty/staff advancement mean in a world of DE? Does innovation in technology 'count' toward promotion and tenure? Does a scholar who thinks deeply (and publishes) about how technology affects learning deserve the same treatment as one who publishes a standard research paper? What new role must advancement/promotion and tenure committees undertake, when their membership is made up of traditional faculty, yet the dossier before them not only is claiming instructional technology scholarship, but its content is perhaps beyond the committee members' grasp? How do you retrain such committees? Do traditional publications and the peer review process supersede all others, or is it possible that in the age of technology it may be prudent to publish first and then be refereed? Is the institution willing to fundamentally rewrite its advancement guidelines to accommodate the new way of learning, conducting research, and publishing?

It will take visionary and skillful leadership with strong backbone and convincing willpower to speak to these issues. It will take leaders who constantly think outside the box and who are able to set policy even when the vision is somewhat blurred.

New leaders must confront issues that go to the core of what an institution is and has been. They must tackle transformational changes that often go against the very grain of faculty fabric. There will be faculty who see DE as a time-consuming, money-draining fad that is intent on removing their cherished faculty-student eye contact of the classroom setting. On the other hand, there are many potential students who can only become students if DE is made available. Equally, there are many traditional students who look forward to the added dimension DE brings to their learning.

Experience shows that transformational changes will be most successful when

- there is administrative support of, and administrative practice in, the use of DE.
- advancement/promotion and tenure guidelines are rewritten.
- a new DE office stands on its own, and is not affixed to an existing office (such as an extension centre). Fundamental questions regarding the soundness of extension centres will invariably carry over to DE.
- early DE successes are assured with grants, publications, notoriety, etc.
- it is recognized that faculty training in DE is generally not successful. Faculty often feel, in the words of Winston Churchill, that "I am always ready to learn, although I do not always like being taught." Instead, highlight good examples, promote those with DE scholarship, and give salary increases to deserving faculty. Examples will change the culture.
- it is realized that transformational change will take a generation and its leadership will likely become a victim even of its own success.

Funding

Money for DE can be a double-edged sword. On the one hand, since money brings power, it is important to make sure early attempts are properly funded so they can develop and, perhaps even more important, can be noticed. On the other hand, is it time to re-examine funding structures tied to political and educational jurisdictions? Essentially administrators must rethink "in-state *vs.* out of state" (U.S. terminology) tuition. Does it still make sense in a world of DE to insist on such division? Will the regulatory power of funders (donors and legislators) continue to steer or will they leave these judgments to institutions? Is it wise to pour a lot of money

into equipment and support needs without having absolute assurance of DE's ultimate success? What about faculty who insist on start-up money or ask for released time from teaching to devote their energies to DE?

Again, educators should take a lesson from the retail world, which has found a system that is both ubiquitous and of high quality, rather than exclusionary and rare. The latter serves the elite few, the former the masses.

Accreditation

Will DE teaching of an existing course be submitted to the curriculum committee as though it were a new course, or will it be accepted as a new teaching method for an existing course? Not only is accreditation of new departments and divisions with a DE emphasis an issue for the administration, but global accreditation between institutions and countries becomes of monumental significance. How can accrediting bodies be sure the courses are not watered-down versions of a rigorous on-campus course?

Testing

This remains a major issue for many DE courses. How can security be assured? Should testing be conducted on campus only, or can an off-campus arrangement be secured that will maintain integrity? Some institutions use a local person in a supervisory relationship to the student to monitor tasks such as quizzes and tests.

Laboratories

Most current DE courses are non-science in order to avoid the difficult issue of laboratories. No other aspect has caused a greater challenge than the delivery of laboratory experiments via DE. Most vexing has been the dilemma of access *vs.* safety; it appears that as one improves the other degenerates. Couple safety issues with legal concerns, and in some countries a stifling situation is created.

Do students come to campus for laboratories at periodic times, do they go to local institutions, do they do the experiments at home, do they use animations on the Web, or do they use videos? What are the advantages of virtual *vs.* actual experiments? Are the principles being illustrated of primary concern, or are issues such as set-up, socialization with fellow students, the touch and feel of the laboratory environment, breakage, failed experiments, exposure to potential dangers, just as important as scientific principles?

Some institutions use a blended approach of actual experiments either at home or at some institution, DVD/videos, and the Web for virtual experiments. Virtual animal dissection, chemical experiments, the observation of physical phenomena, even the control of a telescope can all be done at a distance. (See Chapters 5–9 for more examples around laboratory delivery.)

Conclusion

The electronic revolution is here, and it is ubiquitous (Fischman, 2008), forcing education to redefine its mission from teaching students to engaging every person who wants to learn. The barriers academia has set up over time, whether involvingthe use of papyrus by the students of Plato, or gender, religious, and racial quotas set up in some countries, are being eliminated in sweeping proportions.

Wonderful new opportunities suddenly spring to the forefront, such as mass distribution of science literacy in an engaging way and open access to education for all and for free. There is wide flexibility as to when and how to attend classes, using learning styles from engaged studies to chat room discussions, and giving the student control of her destiny.

It is New Year's Day, 1895. My name is Hans. For seven generations my family has made the finest buttons in the region, using good local horn. Today I learned that the railroad is coming to our village. My friend Olaf says that cheap factory buttons will come on the trains, but that they will

never compete with my craftsmanship. I think he is part right and part wrong. They will come, but they will compete with my buttons. I must make some choices: I can become a distributor for the new buttons, or I can invest in the machinery to make buttons and export them. Or, closest to my heart, I can refine my craft and sell exceptional buttons ... I cannot stop the train; I must change.

• Adapted from a fable told by William A. Wulf in *"University Alert: The Information Railroad is Coming."* Published on the Web. (http://net.educause.edu/ir/library/pdf/erm0310.pdf)

Hans, in the fable above, is an exception; he realizes that change is coming and is unusually clever in seeing what that change means, and envisioning several scenarios for himself. But most of all, he is doing something about his situation.

The opportunities are here. Will we be clever enough to seize them?

REFERENCES

Arnaud, C.H. (2007). A new science channel. *Chemical and Engineering News, 85* (26), 44–46.

Astin, A.W. (1996). Involvement in learning revisited: Lessons we have learned. *Journal of College Student Development, 37*, 123–134.

Bloom, B.S. (1984). *Taxonomy of educational objectives.* Boston: Allyn and Bacon.

Bok, D. (1986). *Higher learning*, (p. 165). Cambridge, Massaschusetts: Harvard University Press.

Boschmann, E. (2003a). The IUPUI story of change. In J. Bourne & J.C. Moore (Eds.), *Elements of quality online education: Practice and direction, 4,* (pp. 213–228), The Sloan Consortium.

Boschmann, E. (2003b). Teaching chemistry via distance education. *Journal of Chemical Education, 80*, 704–708.

Chickering, A.W. & Gamson, Z.F. (1987). Seven principles for good practice in undergraduate education. *Wingspread Journal, 9*(2), 1–4.

Daniel, Sir J.S. (1997). Why universities need technology strategies. *Change: The Magazine for Higher Learning, 29*(4), 10–17.

Daniel, Sir J. (2005). International perspectives on open learning and distance education. Presented before the National Forum on Open Learning and Distance Education The Gambia. Commonwealth of Learning 12–14 April, 2005.

Dierker, R.A. (1995). The future of electronic education. In Erwin Boschmann (Ed.), *The electronic classroom: A handbook for education in the electronic environment,* (pp. 228–235). Medford, NJ: Learned Information, Inc.

Drucker, P.F. (1992). *Managing for the future: The 1990s and beyond.* New York: Penguin Press.

Fischman, J. (2008). Distance education becomes a major part of course catalogues. *The Chronicle of Higher Education*, December 30.

Johnson D.W. & Johnson R.T. (1992). Implementing cooperative learning. *Contemporary Education, 63,* 173–180.

Kidder, R.M. (1987). *An agenda for the 21st century.* Cambridge: MIT Press.

Kulik, C-L.C. & Kulik, J.A. (1991). Effectiveness of computer-based instruction: An updated analysis. *Computers in Human Behavior, 7,* 75–95.

McLuhan, H.M. (1964). *Understanding media: The extensions of man.* New York: New American Library.

Naidoo, G. & Potter, C. (2007). Ethical issues in using interactive radio in South Africa. *Open Learning*, *22*, 159–165.

Palloff, R.M. & Pratt, K. (2008). *Assessing the online learner: Resources and strategies for faculty.* San Francisco: Jossey-Bass.

Pascarella, E.T. & Terenzini, P.T. (1991). *How college affects students: Findings and insights from twenty years of research.* San Francisco: Jossey-Bass.

Schramm, W. (1977). *Big media, little media: Tools and technologies for instruction.* California: Sage Publications.