Tele-Teaching: Australia's Competitive Question

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As computers and telecommunications stretch across the globe and merge into compunications, new opportunities arise for activities that cross national boundaries and become transformed into something never before possible. This chapter provides an overview of one of these activities, which is poised to undergo a fundamental transformation within the next decade — information technology (IT) in education. This chapter first presents an overview of the literature on IT in education, distance education, and the potential convergence of on- and off-campus education. A characterisation of the higher education sectors in Australia and Asia is then presented, as well as the current trend of Australian universities to establish off-shore ties with organisations in Asia to deliver international, "information-age" education. The impacts and opportunities of IT for education in general, for Asia's emerging economies, and for Australia (as an education provider) will also be examined, along with some initial strategy recommendations.

> "Technology romances us, and people with visions of a greatly improved educational system are drawn to the possibilities. We are hopeful …." (LaFrenz, 1989: pp. 224)

Overview

IT in Education

"The Internet is a huge, amazing, world-wide system of voluntarily interconnected networks with literally millions of documents, resources, databases and a variety of methods for communicating - it has become the best opportunity for improving education since the printing press started putting books in the hands of millions." (Ellsworth, 1994: pp. xxii)

The promise of computers in education is substantial. Hence, it is surprising that remarkable little has been published about its impact in the leading, non-technology-specialist education journals over the past decade and a half. Odd though it may be, computers have found only a small place in classroom instruction (Kerr, 1991), even taking into account the extensive expenditures made on computing by schools and universities. The printed page and the humble overhead projector are still the most common teaching tools in universities.

Concerns about computers replacing the teacher have re-emerged and were furthered by the emergence of artificial intelligence (Chaiklin, 1988). In practice, self-paced learning computer systems have had some effect on the role of the teacher and on classroom structure, and there has been some success in individual tuition within the constraints of teacher-established curriculum structure and educational goals, along with some freeing of teacher time (Chaiklin, 1988). But questions about the neutrality or non-neutrality of technology and what the teacher can contribute to the educational process (beyond providing guidance in the use of the technology) remain open for continued debate (Bowers, 1988; Chaiklin, 1988).

Television's threat to replace teachers was real, but teachers were not replaced. However, one cannot deny the impact television has had on society. Perhaps "the greater

significance of the computer in education may be its influence outside the school" (Southwick, 1986: pp. 84). As Bowers wrote, "Briefly, all aspects of human experience are influenced and sustained by culture: technologies, customs and norms, political and economic institutions, and so forth." (Bowers, 1988: pp. 42)

Towards the end of the 1980's, interactive video, which added 'interactivity' to known movie and television images, presented possible opportunities for greater learning (Seal-Wanner, 1988), but far more research is needed for these technologies to serve their full educational potential. At about the same time, graphics and icons were making more of an impact on the computing environment as "front-ends" became more user-friendly and encouraging the proliferation of desktop computers.

In 1989, Harvard Educational Review ran a special edition "Visions for the use of Computers in Classroom Instruction" which was followed by an edition which presented responses to these "visions." Thus, as authors started to evaluate the impact of computers, it became an opportunity to ask fundamental questions about education (Southwick, 1986). They began using "computerisation as an occasion for rethinking education in a way that seriously attempts to enhance student … intellect" (Bredo, 1989: pp. 206).

To improve education is a desirable aim. To foster creativity, initiative, and adaptive intelligence among all students is desirable. To have educators work together is desirable. The papers originally presented in the special edition all turn to computers as a means of fostering these changes (Bredo, 1989; Winn, 1989). Kerr pushed this theme even further, suggesting that technology become a fulcrum for educational change. Teachers are cautiously adopting technology and change is being seen in the classroom. Kerr contends that (slowly or not) they are "crafting" their own way forward (Kerr, 1991). Unfortunately, technology changes fast, and people change slow.

Even as computers and telecommunications are becoming (however slowly) a universal fact of life, the instructional use of information technologies still remains the exception and not the rule (Cuban, 1993). Cuban noted that, "technology innovations have never been central to an national (i.e. American) movement to improve schooling since the origins of public schools a century and a half ago" (Cuban, 1993: pp. 206). It is a "dominant cultural belief about what teaching, learning and proper knowledge [is]" that marginalised the use of computers and telecommunications in schools and not the common excuse of a lack of funds and unprepared teachers.

Cuban believes it is desirable that technology be used to create "self-directed learners, independently thoughtful students, and learning communities" - a desirable goal for higher education - along with achieving the important goal of students' learning to work collaboratively. However, it must be noted that universities are traditionally very inflexible when it comes to changing the way they use their physical resources. For example, for a lecturer to change the size of the class they teach can become an logistical nightmare. Universities still predominately use the lecture as the central method of instruction, and they are constrained with inflexible administrative systems for registration, room reservations, teacher evaluations, etc.

Self-directed instructional design systems are used to supplement courses, but not to replace them. This overall lack of technology use and lack of educational reengineering may at least partially explain the lack of research on what changes should be made and how to manage the mess.

No matter how staunchly technological transformation of education is resisted or ignored, universities —like it or not — are in the information business. Computers and worldwide networks are (or should be) changing the way they work. As Brandt wrote, "Perhaps the most fundamental technology, and the most powerful, is digital technology, which is revolutionising the way people produce, store, retrieve, and use information." (Brandt, 1995: pp. 5)

Although one of the most important of the digital technologies, there is relatively little knowledge of how the advent of the Internet (which predominately started in most countries by establishing an inter-university network), has affected academic institutions. Until recently, research offered little practical guidance to assess the impact of networking on traditional areas of academic institutional performance such as teaching, research, and service (McClure, 1996).

According to McClure and Lopata (1996), an adequate network infrastructure is essential to attack and retain high quality faculty and students, but without good measures of teaching, research, and learning prior to (and after) networking it will be difficult, indeed, to assess the impact of networking or evaluate the different strategies for employing its aid. So, they developed a variety of basic assessment techniques with which to begin an evaluation of networking on any given campus. Unfortunately, given the tough task of planning and managing an institution's network environment, and given the forces against change mentioned above, institutions are finding it difficult to manage this resource. Networks are becoming increasingly complex and distributed and, therefore, more difficult to support and maintain.

Distance Education

Many authors have proposed definitions of distance education (see, for example, Keegan, Perraton, Holmberg, Forsythe and Peters), and the core of all of them is the physical separation of teacher and learner (Sauve, 1993). While conventional distance education (or "correspondence" education) has been carried out by mailing printed materials to the student, there is a long history of using a variety of technologies — more so, it appears, than in conventional, on-campus teaching. An emerging trend appears to be the greater use of distance and "open learning" materials for on-campus teaching (Crock, 1994).

Technology's importance in distance education has grown over the years as more technologies have become available, their costs are dropping, they become easier to use, and many of the technologies, themselves, are integrating (Bates, 1993b). Garrsion (1989) proposed that there are three

generations of distance education communication technology: (a) mail, (b) telephone and fax, and (c) computer communications. Duning (1993), on the other hand, summarised the evolution of educational communications systems as follows:

Phase 1: Print (correspondence)
Phase 2: Print and audio (radio, audio-conference, cassette)
Phase 3: Print, audio, video (television, satellite, video-conference)
Phase 4: Print, audio, video, and computer (computer assisted instruction, electronic mail)
Phase 5: Blend of technologies (audio-video-graphics, compressed video)

Research has also determined a range of other issues relating to the learner in distance education: there is positive student attitude to immediate feedback via computer-assisted systems (Andrews, 1985); communication between learner and teacher is enhanced by computer assisted means (Andrews, 1985); students want a higher level of general support (Phillips, 1990); email reduces student isolation (though students here had face-to-face instruction) (Phillips, 1990); transfer of information from instruction to student is the primary determinant of learning and satisfaction in telecourses (Walker, 1992); certain students will sacrifice the norms of face-to-face communication present in the traditional classroom for the necessity and convenience of telecommunicated information (Walker, 1992); "systems which emulate the norms of face-to-face communication and which adequately convey verbal and non-verbal cues appear to be critical. The design of the telecommunication system must convey immediacy and enable immediate feedback and participant spontaneity" (Walker, 1992: pp. 90); and completion rates are higher using computer-assisted learning than traditional correspondence (Andrews, 1985; Scriven, 1991).

There appears to be quite a scarcity of research concerning the use of blended technologies (i.e. Duning's fifth phase). Considering the wide range of technologies available today, many of which are used in a variety of combinations, this paucity of research is disappointing. A potentially useful investigation (yet to be made) would be to measure the performance (learning) outcomes of "matches" and "mismatches" in type of student group and technology blend.

At this stage, it is important to clarify the relationship of educational technology and distance education. According to Keen (1992, in Sauve, 1993) and Peruniak (1983, in Sauve, 1993), distance education uses technology to reach geographically dispersed groups of students and deliver instruction where educational technology studies the efficient use of technology for all types of teaching.

Bates proposes four hypotheses about learning from technology (Bates, 1993b):

1. Multiple forms of experience are required before the learner internalises and comprehends,
2. Media are 'neutral' regarding content, but specific regarding skills. (There are suggestions that media differ in the learning skills that they best develop, but there is very little evidence, and after decades of intermittent debate on whether media is 'neutral,' some compelling arguments have recently emerged that suggest it is not (Burbules, forthcoming)),
3. Media can be matched to appropriate conceptual models of thinking, and
4. Learners need to interact with the material, tutors/instructors, *and* other students in order to learn effectively.

A number of variables are relevant when considering appropriate media for a specific teaching task. Firstly, there is the choice between ephemeral technologies (e.g., lectures, broadcast etc.) or permanent technologies (e.g,. books, cassettes, computer packages etc.). Research would suggest that learning from ephemeral media is much more difficult than learning from permanent material. It appears to now be a given that 'one-way' media (e.g., print, broadcast, cassette etc.) requires supplementing with 'two-way' media (e.g. telephone, email, correspondence etc.).

It is appropriate that these hypotheses be argued not only in the distance education context but that they be thought of also in the context of on-campus teaching. Distance education and classroom education utilise different procedures but "all teaching-learning situations contain the same essential elements" (Childs, as quoted in Andrews, 1985: pp. 145). Peters (1988) suggests that distance education is characterised by the division of labour necessary to manage distance education and its materials properly and the mass production of materials.

Institutions that provide distance education fall into two broad categories, the *autonomous distance education institution* and *distance subsections of conventional institutions* (or mixed institutions) (Keegan, 1993). Within the autonomous institution categories, there are two basic groupings, the private and public correspondence schools and colleges (Group 1) and distance teaching universities or open universities (Group 2). In Australia, Group 1 was the chosen model for government correspondence schools for over seventy years. Basically, the didactic structure of their operations consists of the school posting to the student learning materials that have either been developed or purchased by the school. The student studies the materials and posts assignments back to the school, which marks and comments the work and sends it back to the student. The process continues. Group 2 institutions attempt to enhance the link between the student learning and the learning materials. Often, there is greater use of non-print material. These universities are usually the university of a nation and the well known one is The Open University of the United Kingdom (OUUK) which commenced in 1969.

Groupings within the mixed institutions category differ both administratively and didactically but normally teach at higher education level. The first group of this category, Group 3, independent study divisions of a conventional college or university, have been in existence in many countries of the world for almost a century. They also form part of Australia's long history in distance education. These conventional insti-

tutions usually have an extension college or continuing education unit and it is from this unit that courses are offered in various delivery modes. Course development is usually done by academic staff paid extra above their salary to produce and sometimes deliver. In some cases, a student can get university credits, but often is the case, there are limitations to their ability to complete a full degree from this sort of unit.

Another mixed institution group is that of the consultation model (Group 4). This has its roots in Eastern Europe and traditional correspondence plays a diminished role. The student's workplace plays a significant role in the study programme and usually the students are sponsored by their firm and in turn, their thesis work is general on some aspect of the firm. Their study is supplemented by regular seminars or consultations. This approach is unique as it attempts to provide an interaction of work and study that is not paralleled in conventional education.

The last group is that of the Australian integrated or dual mode model (Group 5). This is often referred to as the "new england model". Born out of Australia's history in distance education, in 1955, the University of New England began teaching both on campus and externally with lecturers being given a mandate to teach internal and external students in equal numbers. Lecture notes, video tapes and/or audio tapes are sent to external students. Students are enrolled in the same courses, take the same exams and qualify for the same degrees. There is usually a requirement that external students spend a compulsory period of time on-campus. The external studies unit is simply an administrative structure to manage the external students and has no teaching function. Many other countries has since adopted this model of distance education.

Convergence of On- and Off-Campus Education

We tend to think of face-to-face education as the norm. This would make distance education not normal, or less privileged or ideal, by implication. Bigum defines face-to-face teaching as "proximity education" and suggests that to deconstruct proximity/distance education is to identify what is privileged about proximity education (Bigum, 1990). Why does it seem desirable to recreate this teaching situation rather than allowing the new mediums to alter the way we communicate, teach and learn (Duning, 1990) is a valid question.

Many institutions are seeing the newer technologies as a way to extend the classroom. This drive, perhaps, is to reach more students for less dollar per student, or it may simply be part of the quest find new market niches. All the same, the main concerns seem to centre around the appropriateness of using certain technology to reach target groups and the associated costs. Major criticisms of this move is that many institutions are failing to "exploit the unique pedagogic characteristics of each medium" and are ignoring "advances in curriculum design associated with the development of integrated, multimedia distance teaching materials" (Bates, 1993b: pp. 217).

While new technologies are enabling cross-national delivery of courses. (Duning, 1990), it is worth noting that no global theory of distance education exists yet (Sauve, 1993).

It appears that the dichotomy between distance education and 'proximity' or on-campus education is disappearing and that there is a convergence occurring in higher education. Further, studies show that students who study via telecommunicated (live) distance education approaches perform as well as their counterparts in traditional classroom settings (Barker, 1993; Dillon, 1992). Others talk about the eroding at the tertiary levels of the distinctions between "conventional" and "distance" education. The drivers seem to be both technological and economic factors (rising students and declining resources), rather than any educational analysis of the teaching/learning problems or needs (Kirkwood, 1996). Comments like "bandwagon of distance education", "hottest growth area is online education" and "cost saving by using telecommunications" are seen through the literature.

One way to effect this convergence is to add 'distance' to conventional classroom, on-campus education (Hall, 1996: pp. 76):

> One way that the use of networks in distance education could be approached is to take a conventional campus-based model of higher education, with lectures and tutorials, and overlay these with telecommunications to make them 'distant'."

Another way to effect this convergence is to add electronic/computer networks to traditional distance education. Such activities can include using computer mediated conferencing (CMC), a step on from email and bulletin boards, and provide access to electronic libraries and resource-based learning materials. The Open University of UK have been employing ways to establish collaborative learning activities, like group projects (Hall, 1996).

Is extending the classroom in this way the best way to proceed? It appears that there is still much uncertainty around as academics make the following types of comments; "design must be carefully chosen to ensure the best delivery", and "there is no consensus on the precise combination of technologies that will eventually support the evolving global information network."

Availability of equipment in the home (most importantly) and at work is an issue (Bates, 1993a). Statistics abound these days about the penetration of various technologies in our society and that of many countries around the world.

However, choice should be not "what technology" but what kind of teaching do we want to provide (Bates, 1993a). This is complexed by the "new generation of student" coming through the education system while at the same time, there is a reluctance for faculty members to change and introduce technology in their teaching (Carpenter, 1995).

Boyd (1993) talks about "learning networks." Computer communications is a way of "building pluralistic, geographically extensive networked learning communities of complementary human capabilities which can work together in mutual appreciation …" (Boyd, 1993: pp. 235). This moves away

from traditional distance education and starts to raise issues relating to evolving communities in "cyberspace".

Amongst information system (IS) academics (via ISWORLD), there is much discussion about the following sorts of issues: the "virtual" academic world; use of WWW sites to augment classroom teaching; mounting on-line courses; and the establishment of Global Network Academy (GNA), an accredited on-line university. Many IS and technology conferences reflect the need to discuss issues relating to education, however, there still appears to be very little work produced in this area except for "show and tell" type articles.

What is enormously perplexing is the experience of the Open University of UK. Their programs are still predominately correspondence, printed text based. Some audio and video material may be included with the teaching material where it is appropriate. Most tuition is undertaken in writing. Tutors are assigned to all students and feedback and interaction occurs via marking and annotating assignments and by using telephone calls. Where possible, they plan residential schools and they play an important role (Hall, 1995).

The level of investment required to produce quality distance education materials is very significant. For each half credit course involving 240 hours of student learning (as opposed to student contact hours) "the OU Open University invests around 1400 days of academic time, plus a lot of support time of management, administration, TV production and publishing. This makes the total cost for a 240 hour course well over a million pounds sterling" (Hall, 1996).

It is not clear that this level of investment is in the minds of university academics and administrators who wish to add 'distance' to their conventional classroom teaching programmes. Most universities seem more focused on the opportunities that telecommunications systems can provide. The question remains, what are universities doing about this?

Ives and Jarvarpaa (1996) issue a strong warning. Business schools are vulnerable. "Surviving institutions will likely have the strongest brand names, be able to provide both scale and scope and have the most flexible faculty" (Ives, 1996).

State of the Art in Asia and Australia

Higher Education in Australia

Government and education leaders in Australia are trying to come to terms with what these sorts of changes really mean for them, and in turn, what they should be doing about it. In the Australian 1996 Higher Education Budget Statement, the Minister for Education announced a Review of Higher Education Financing and Policy. It cites a number of new forces shaping the future environment for higher education on a global scale, among the top two issues were the impact of advanced information and communications technology and the globalisation of higher education (DEET, 1996). The Australian government is not alone in their quest to find answers to the above mentioned issues. It is understood that they present both challenges and opportunities.

While the "computer revolution" has moved through higher education over the last decade, it is a sector that has been affected by other influences. After a decade and a half of reforms, an expanded higher education sector in Australia is facing tightening government budgets (like the United States, United Kingdom and many OECD countries before it) and increased competition for student and research funding from industry and various research councils (Winship, 1996). Doing less with less is not an acceptable response to government just as it will be unacceptable to increase class sizes and expect academics to increase their teaching duties. The alternative is "doing more with less" by restructuring (or reengineering) the universities. "This means rethinking our assumptions about delivery systems, curriculum, organisational structures, and the mix of technology and personnel." (Mingle, 1993)

The expectation that the sector continue to deliver quality and effective higher education is being held high as governments introduce audit and review processes to assess and ensure that institutions are indeed delivering good education, and where possible, improving the quality of processes within the institution.

Thus, there has been enormous pressure to explore ways to find considerable efficiency gains within the system. In many situations, this has involved institutions merging or establishing collaborative and co-operative ventures or arrangements. In an attempt to reduce the teaching cost per student is flagged as a great opportunity to find further efficiencies by using alternative modes of delivery of education, the pressure to compete for new student markets also increases. As existing students are expected to contribute towards a larger percentage of their education costs and as new and existing markets produce fee paying students, institutions are finding themselves having to become more customer-oriented. This, in itself, is not an insignificant change in culture for universities.

Knee jerk reactions to budget cutbacks seem to bring about a two-edged response to IT budgets, particularly as universities count how many dollars they have spent on IT/computing over the last decade, building networks and buying computers. Many universities are pulling back on their IT spending while evangelists and visionaries call for long term planning with statements such as, "Universities cannot stand apart from currents of change if they are to be nerve centres of the Information Age." (Winship, 1996)

"My own view is that those universities that succeed in integrating their strategic and information planning will define a new model in tertiary education." (Reinecke, 1996) In this article, Dr. Reinecke goes on to imply that universities that do address their information and information technology issues will, in turn, place themselves well in the educational market.

These markets will not only include school leavers, but will include overseas students, professional and continuing education. Commentators would say that services will become based on the convenience of the "customer" rather than that of the institution. The expectation, or ideal, is that truly learner-centred education, individualised, will be delivered directly to the individual at a time and in a place determined by

the learner. It is suggested that this move will require a different kind of capital investment and areas like governance structures, assessment tools and the nature of relationship with the "clients" will not remain untouched.

Higher Education in Asia

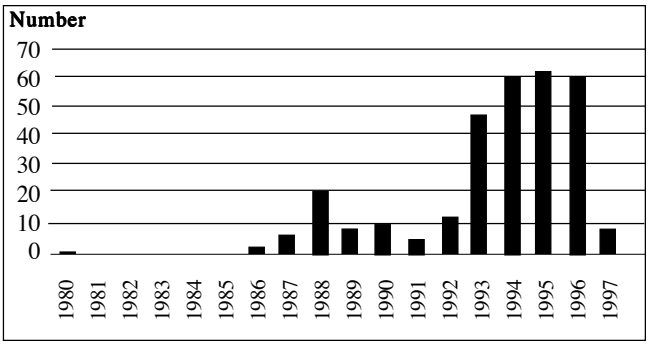
"For the past quarter century, higher education has been high on the agenda of governments and central to the fortune of nations." (Neave, 1995a: pp. v)

With Asia on the rise and technology enabling students to assess education across national borders, it is easy for Australia, being close geographically, to view these potential markets with optimism. Student admissions in East Asia have increased phenomenally since World War II (Yee, 1995). In the last decade, Australia, along with other countries like United Kingdom, United States, New Zealand and Canada, has seen an increasing flow of overseas students from Asia enter its higher education sector and this export market has become very lucrative. In fact, "… the comparative analysis of higher education policy … has acquired a new significance as the pace of 'internationalization' itself quickens." (Neave, 1995a: pp.v) Unfortunately, this comes at a time when governments in this region grapple with the issues relating to higher education in their own countries. "During the last four decades the enrollments in the higher education systems of the developing nations have increased dramatically…. However, the increase in public resources for higher education has not followed the expansion of the higher education systems. The share of the public budget devoted to education in general has remained constant, if not declined, during the period 1965-1980" (Neave, 1995b)

In 1969, the British Open University (or The Open University of the United Kingdom, as it is now known) was established as an independent academic institution with its own formal structures (i.e, Keegan's typology model Group 2). Since then, we have seen many open universities established, many of which are in developing countries. These universities have very large enrolled student numbers. The Universitas Terbuka (UT) in Indonesia had more than 150,000 students in 1988/89. The Sukhothai Thammathirat Open University (STOU) in Thailand has an enrollment of 150,000 students with an annual intake of 80,000 (Seet, 1992). The Open University of UK has had over 2,000,000 students over its history.

In the light of these enrollment figures, the number of overseas students studying in Australia is still on the rise along with the number of students studying at Australia off-shore locations.

There are many world organisations working hard to encourage co-operation between developed and developing countries particularly to promote the use of communications and information technology for the purpose of distance learning. These organisations include the Commonwealth of Learning, the World Bank, APEC through its Telecommunications Working Group, the International Telecommunications Union (ITU) with its Virtual Training Centre (VTC),



Number of "Links" Per Year (1996 AVCC Audit)

Global Telecommunication University (GTU) and Global Telecommunication Training Institute (GTTI), the United Nations Educational, Scientific and Cultural Organization (UNESCO), whose brief is to contribute to peace and security in the world by promoting collaboration among nations through education, science, culture and communication, works with organisations like the Australian Vice-Chancellors' Committee (AVCC) to establish and support initiatives like the UNESCO UNITWIN Asia-Pacific Higher Education Network (APHEN). Such activities play an important role in assisting universities to internationalise their functions and form co-operative links with higher education institutions in other countries.

Austral-Asian Distance and Off-Shore Education

Australia has an opportunity to provide quality education for all of Asia and, indeed, for emerging economies world-wide if it adopts a global, information-age approach. It already has a long history in distance education. Its "school of the air" is well known and external studies have been part of university activities for a long time. Many of the early Australian universities, like The University of Queensland and The University of Western Australia, were involved in external studies in the early 1900s. It is claimed that The University of Queensland probably was one of the first institution's in the world to offer a full degree by correspondence (Chick, 1992).

Later, as more universities opened their doors in Australia, many of them did so with specific Charters (or Acts) to provide education on- and off- campus. This fell in line with the Australian ideal of "parity of esteem" which stresses equivalent provision, standards and recognition of awards obtained through on- and off- campus study. So, "dual-mode" universities started to appear in Australia and the University of New England (Armidale, New south Wales) provided its model of operation as the "standard" or "new england model" as it has become known (i.e., Keegan's typology model Group 5). In brief, academic staff are required to teach on- and off-campus students.

By the 1960s and 1970s, over 30 Australian institutions were offering external courses, and in 1989, the Common-

wealth Government attempted to cut this number down by establishing 8 universities as Distance Education Centres (DEC). These Centres were given financial benefits over any other institution in the country who wished to teach in external mode.

Open Learning Australia (established 1993) was set up to offer all Australians regardless of age, location or educational qualifications, the opportunity to study university and TAFE units leading to diplomas, degrees and other qualifications. It was established as a national brokerage agency and collaborates with 29 Australian universities and TAFE colleges.

In recent times, Australian universities have began to establish off-shore "links" with institutions and organisations overseas. An early such arrangement was made between Curtin University of Technology (then known as the Western Australian Institute of Technology) and the University of Hong Kong and it was to provide the Bachelor or Commerce (Accounting) on site in Hong Kong. The 1996 audit by the Australian Vice-Chancellor's Committee (AVCC) indicates that there are now 303 such arrangements (i.e., one arrangement or "link" per degree type), offered by 33 Australian institutions in 21 countries (14 being in Asia) using at least 100 institutions/organisations in these countries. Offerings include Bachelor degrees, Graduate Certificates, through to PhDs in areas covering management, accountancy, computer science, education, nursing/health, engineering and law, just to name a few. As shown below, there has been a sharp increase of activity in the last five years.

This trend indicates a possible divergence from Keegan's autonomous/mixed mode typology of distance education institutions. Collaborative arrangements are made with off-shore organisations, who in turn may have entered into a number of such arrangements with other universities around the world. It is unclear what the "model" would be for this off-shore education.

The Australian universities in question may not have an external studies or distance education unit. The off-shore arrangement may be formulated between a particular faculty unit and the off-shore organisation. The other divergence from Keegan's typologies is the fact that education is delivered with a mixture of distance education and on-campus styles. It is very easy to fly lecturers between Asia and Australia, allowing them to delivery lectures on location. The combination of face-to-face, local tutors and use of distance education materials differs greatly from university to university.

Australian universities differ in the following aspects: their culture background and organisational focus on distance education; range of international activities (which may have a predominate research based); central or devolved management structures; the importance the institutions places on IT, IT strategic plans, the presence of senior IT executives; and the provision of support for teaching and use of IT - to name only a few. There is diversity in the Higher Education sector in Australia despite government policy back in the 1980s, which attempted to standardise these things.

Apart from the obvious globalisation influences, the change in funding of universities (the need to do more with less), and the presence of literature where authors talk about the "convergence" of education due to the availability of technology, we must raise the question - what is really happening in the off-shore education scenario?

Impacts and Opportunities

Globewide Education

Globalisation harbours a number of influences that will affect the manner (and timing) of Australia's foray into globewide education. First and foremost, the many "world" organisations are having a major impact on a number of countries and their national agendas, including issues like trade, economics, international collaboration and infrastructure provision for many industries. It is particularly predominate in the last five years, that these organisations are also focusing on education and the use of telecommunications and information technology. It is not surprising that this move is having an effect on the minds of leaders (government and university) and ensuring that the issue of globalisation is upper-most in their minds and agendas.

As large distance education institutions like the Open University of United Kingdom start providing their courses in regions like Asia and as many other universities from countries like the United States, New Zealand, Canada and Australia "export" education, as well, the influence is strong. Apart from most of this education being delivered in English, and by teaching staff predominately trained in western universities, it could be viewed as another wave of colonialism (Hall, 1994). Asia is not being alone in this phenomena.

At the other end of the scale, there is a more subtle form of globalisation occurring. The influence of the Internet to encourage further globalisation is not yet fully known (Burbules, 1995; Burbules, forthcoming; Burbules, 1996).

Access to technologically based education in developing countries would be limited to an elite group (Hall, 1996; Hall, 1994). The ITU Internet Society report that there are only a few more Internet users (i.e. 2,300,000 in 1995/6) in the Middle and Far East Asia as there are in Australia. When the population figures are compared, it highlights a gross imbalance.

Asia's (And All) Emerging Economies

"Distance education initiatives have been happily introduced in emerging economies, in the belief that major social and educational problems such as illiteracy, a largely untrained work force, and economic development will be solved through inexpensive, systematic, mass produced, distance education programs " (Gana, 1984; Guy, 1990, 49) The third world countries have accepted claims about distance education such as cost advantages, its ability to satisfy the demands of large numbers of students who can't be catered for in traditional settings and its better use of scare resources (which, in reality, is not always the case) (Guy, 1990).

In examining this phenomenon, Guy debated the appro-

priateness of distance education's assumptions and practices, as they are presently conceived and applied in the third world (Guy, 1990). He argued (Guy, 1990: pp. 48):

> … that the ideological foundations of western conceptions of distance education dominate and that insufficient recognition has been given to the cultural contexts in which distance education is situated in the third world…. Distance educators are unclear about the impact of distance education on the social, cultural, political and economic contexts of the third world; the role of text, so central to the conceptualisation of distance education has been left largely unconsidered; and the relationships between teachers, students and distance education institutions in terms of power, control, alienation, ownership and independence generally remain unexplored….Distance education has tended to be adopted as yet another means to reduce the gap between the so-called developed and less developed countries of the world [and]…. tensions are apparent….The ideology and the consequences of present distance education practices in the third world require reflection, critique and understanding, in order that distance education may contribute to appropriate forms of development in the third world.

Much of the distance education that occurs in developing countries is based on the models of distance education which emphasises independence and autonomy. Developed-world value assumptions in distance education include (Guy, 1990):

- individual learning, personal work and independence of tutors (Holmberg)
- a plurality of scholarly positions (Holmberg)
- individualisation, self-pacing, evaluation, apartness and autonomy (Moore)
- division of labour, industrialisation and rationalisation (Peters)

Unfortunately, research on distance education in the developing world context is insufficient and inconclusive, and there are a number of issues that need further critiquing. Are the above mentioned value assumptions of education appropriate? What is the role of indigenous knowledge and how is it maintained? There is certainly a need to investigate the cultural contexts in which distance education is situated and develop sensitivity to the initiatives. Guy suggests that theories of distance education should perhaps be in the context of collectivism, group learning, dialogues, co-operation and agreed forms of knowledge (Guy, 1990).

Beyond the philosophical issues of education, extending the reach of universities into developing countries relies on a very practical, physical issue — the presence of technology infrastructures (unless print material is the only medium of choice). Many technologies are fast making there way into developing countries (telephones, radios, cassette players, televisions, videos, computers etc.), and the Internet is slowing extending into many countries, too. As governments of developing countries ponder the way forward to find the best way to provide wider access to education, they have an opportunity to "mix and match" provision. This mix can come from: the growing open universities in the region, established institutions in the region, universities providing distance education from other countries, and collaborative arrangements between local and overseas universities. As it appears to be accepted that face-to-face education is the most expensive, there is an increased role for distance education. However, in recent years, there has been some evidence that local organisations and businesses in developing countries are wanting some degree of face-to-face education, and this has lead to various arrangements with overseas universities. Whether it is distance education or limited face-to-face education being delivered, the role of technology and telecommunications is important.

Besides telecommunications, there is a need for computing facilities. There is debate about what hampers the utilisation of computers in developing countries (Lind, 1991), but it generally centres around the lack of expensive "up-to-date" technology in emerging economies and the fact that computer programs for most applications are based on and developed in accordance with models that originate from a Western view of problems and solutions, and which are not always synonymous with developing countries' practices and information needs.

Unfortunately, establishing appropriate infrastructures in developing countries is not a straightforward issue. In Thailand, there is poverty in rural areas; increase in physical infrastructure invested in the villages such as roads and electricity (including irrigated water) has brought about economic wealth to some but more poverty to others. Infrastructure investments made in the fast-growing cities can be cheaper and can temporarily sate a more powerful demand, but at the risk of alienating the rural population.

Not only is "where" to invest a problem, but "what" to invest in is never fully clear. According to the International Telecommunications Union (ITU), the countries of the Asia-Pacific region constitute the world's largest market for telecommunication's products and services. With the rapid growth and transformation by the convergence of telecommunications and computing services, there is tremendous pressure for countries to make extremely expensive and fairly long-lasting technological decisions in a constantly-shifting technology horizon. The planning and selecting of the "right" strategies are formidable tasks (Salinger, 1991).

As it turns out, when technology is used for delivering education in developing countries, it is currently done so, mostly, to provide training for teachers, medical staff and telecommunications professionals. Further, the vast majority of open and distance learning opportunities in developing countries still do not deliver their education through effective use of educational technology and telecommunications (Seet, 1992). It is suggested that countries with more advanced telecommunications systems have a greater opportunity for experimentation in this area (Seet, 1992).

It must be acknowledged that there will be major change in the use of telecommunications to provide education that no-one can predict, including its rate of change. In fact, while many groups see the Internet as providing the vehicle for extending the reach of education, "There is a growing perception that the schools and conventional universities cannot be the sole purveyors of knowledge and shapers of social attitudes and that mass communications media such as radio and TV can play major roles in transmission of knowledge to large numbers of people." (Seet, 1992: pp. 1) There is a need to be prepared for some sort of change and have the flexibility to adopt (Salinger, 1991). Some two thirds of the people on our planet have no access to a telephone. They are totally disconnected from the communications and information revolution that is the present vehicle for human progress and possibility. Something needs to change.

Australia's Opportunities

Regardless of the distance-less nature of technology, Australia does have a distinct advantage by being geographically close to Asia. Large numbers of Asian students come to study in Australia, mixing with local students and academics. The value of face-to-face teaching and meetings can be more easily addressed, especially with the many flight routes in this region. Video-conferencing of classes in Australia occur in near the same time zone as most of Asia. Collaboration in trade and industry is another growing, particularly with the advent of APEC.

Australia's other competitive advantages include its extensive and diverse background in distance education, coupled with its innovative approach to developing and using technology. Australia's Telstra (i.e. its national telecommunication's carrier) is often under-cited for its provision of advanced technologies throughout an immense country landmass.

While pressure in itself may not be viewed as an advantage, the current Higher Education reviews and changes in government policy presents an opportunity for this sector to address some wide ranging issues that will possibly affect its university campuses and in turn, the Asia-Pacific region. This opportunity to "rethink" its goals and objectives, coupled with the diversity in the sector can be turned into a major advantage.

Australia's Higher Education sector is not without its many challenges. Managing multi-campus universities is not new in Australia. Distances between campuses are often larger than are possible in many Asian countries. However, managing across national boundaries does present new challenges to universities executives. Managing their IT infrastructure across national boundaries compounds this difficulty especially when Higher Education does not have a good record in IT management.

Knowing what characteristics are desirable for their institutions to possess to place themselves in a strategic position in the overseas teaching market is unknown and unexplored. Do the universities with a strong research infrastructure have an advantage to better explore an IT infrastructure with better global reach, or does the university with a strong distance education culture have advantage with their ability in their development of course materials?

What is clear is that Australian universities need the ability to attract and maintain good quality "flexible" academics. Reward and incentive programs for teaching overseas students and using technology in their teaching should be well integrated into the university system.

The quality of service delivered, of course, needs to be managed and maintained. Progress is being made towards articulating good practice approaches to establishing and maintaining overseas collaborative arrangements, but this will need to be developed further.

Australia's Difficulties

The impact of IT on academics has been significant. Not only is their workplace changing due to IT, but the whole sector in which they work has undergone massive change. Many would argue that they are loosing a sense of control over their work; they are becoming increasingly dependent on other people, networks and equipment. Some academics are threatened by IT. They are not convinced it will enhance their teaching, and they especially don't want to take on the role of front-line technical advisory and trouble-shooter. Hence, there is no overwhelming reason why they need to invest in getting IT skills. Frustration is exasperated when they are forced to work in either an IT environment which is not managed well or that lacks support for their work.

Unfortunately, institutions seem reluctant to introduce incentives and reward systems for using technology in teaching, which is a building pressure point with academics. Almost by definition these days, the use of technology in teaching demands that one works in a team, and hence there is a loss of control in the teaching process. They find themselves not alone in classroom, and there is a loss of academic freedom that used to come with classroom privacy.

Another loss of privacy comes with creating distance education materials. Writing course material for lectures, seminars and tutorials is different from writing for distance education. Making your course material available via World-Wide-Web (WWW) or bundled for open or distance education opens the academic up for unsolicited peer review. Adding to this pressure is the need for them to account for their potential student audience. Accounting for culture differences and learning needs in foreign students needs careful consideration.

Teams are needed when developing and using educational technologies. Not all faculty will be the best lecturers and designers of courses. Some might be better involved in navigating, mentoring and certifying. The academic job may get unbundled and academics may have to develop new skills as they have to adopt to working in teams. Further, the issue of support in both the areas of teaching and technology needs close examination by their institutions, and it may be necessary to readjust the notion of infrastructure given these many changes and pressures.

Beyond supporting the academic staff, these institutions

also need to think very carefully about their role in local, national and global communities. Universities have not, by history, been very good at managing their infrastructure. There is little evidence that they assess it regularly, or even put processes in place to balance funding and expectation. Managing a solid IT infrastructure that is flexible and enables the institution to expand its global reach is not trivial. There are many issues that need to be considered once an institution ventures over national boundaries. A good technical skill base needs to be fostered and maintained.

Gaining skill in collaboration and co-operation is vital. Unfortunately, the different players that would need to be collected together – academics, university administration and IT support staff, their overseas counterparts, and local and overseas governments – are not accustomed to working together. Everyone in the process must have at least a rudimentary understanding of the end product ("Teleducation"), the technologies involved, and management processes and collaboration skills necessary to make the joint effort work.

Finally, there needs to be some re-thinking about university-level and national-level strategy. For universities to gain from their overseas teaching, they need to ask themselves what they want to achieve. Is it just new markets? Or is it an opportunity to rethink the way they deliver education, whether on location overseas or on-campus. Making some productivity gains in the contact hour model for staff teaching is a must in the face of reduced budgets. This necessitates a move towards an industrialised notion of education (Peters, 1988). From the national perspective, as Australia becomes a global education centre, what impact will this have on the business community and its economy? Should such an expected impact become the excuse to funnel resources towards education and its requisite infrastructures and establishment of educational and technological standards? What should those educational and technological standards be?

Australia faces some fairly daunting challenges. But it has already started down the path of opportunity. Will it abandon its potential first-mover advantage?

Conclusions

While technology presents the opportunity to provide students with multiple forms of experience, new ways of representing knowledge, and enhanced ways to interact both with learning materials, their teachers and fellow students, the real "impact" remains subject to much debate. The impact of IT in our society, undeniably, presents us with significant pressure to re-evaluate and rethink education. Chris Dede, futurist and technology expert, warns that, "if technology is used simply to automate traditional models of teaching and learning, then it'll have very little impact." (O'Neil, 1995: pp. 6). There is no reason to believe that education should be exempt from the business battle cry "don't automate – obliterate" (Hammer, 1990).

It can be argued that extending the "reach" and modes of delivery of education by using technology does bring value to our community and other nations. But how should Higher Education respond to these issues?

As Ives and Jarvenpaa (1996) pointed out, "Of the sixty-six institutions from the fifteenth century that still exist, sixty-two are universities. But that durability may provide false security" (p. 40). Universities are under threat of being circumvented by private research centres and corporate research as well as private institutions that currently operate in the lucrative graduate and executive education markets. However, they need not always restrict themselves to that scope of activity, and in the coming era of specialised, as-you-need-it education (Toffler, 1980), they may leave universities behind, sitting in the dust, providing little more than advanced secondary education, if that.

What should the scope of the university be? Universities have always, and will likely continue to be, the premier mass-producers of education and certification. In all honesty, a bachelor's degree is really nothing more than a certificate that conveys an assurance of some skill, thinking capability, and exposure to a generally agreed-on set of materials for a given discipline. If universities can get their management systems right (an idea which will bring a woeful grin to the face of anyone who has worked in one), they could create branches of the organisation that provide leading-edge mass- (or non-mass-) customised education. But given the glue-consistency, millipede-with-octopus-tendrils form of bureaucracy which plagues some universities and which has incited business schools *en masse* to attempt a desperate squeezing-out of the university cocoon, universities are not likely to develop lean-and-lithe education programs which would be able to compete with the cheetahs already emerging in the marketplace. Or can they?

How should universities operate in the future? All schools — primary, secondary, university, et al. — should be accessing the finest minds in the world and the best information in the world via the World Wide Web and other electronic means. Registration, course offerings, syllabi, and other materials should all be on the Web, an open and globewide system appropriate for a globewide student body using a cacophony of technologies chosen to suit individual needs. The beginning courses of well-established fields of study (e.g. accounting, engineering, chemistry, etc.) should be taught by computer-based training. An expert should be available for questions not covered by the computer-based teaching (CBT) or to provide alternate explanation, but no more. The lecture method, useful before the time of the printing press, has already been superseded (for the most part) by textbooks, and tiny tutorial groups should in many cases be replaced by a far more cost- and time-efficient method — discussion method teaching in a class (face-to-face or other) of no more than 90 or 100 students each (see Christensen, et al., 1991, for a good introduction to discussion-method teaching).

Unfortunately, not only do administrative and incentive systems mire education professionals in the past, but so do the physical facilities. As discussed above, IT infrastructures at the university- and national-levels need to be built and maintained, including adequate support for non-IT (academic and

staff) personnel. Lecture halls should be converted to public speaking halls, and small tutorial rooms should be converted into meeting spaces and offices. Leggo-block career tracks need to be created for people to mass-produce teaching materials, do the human part of teaching, do research, and/or do administration. And the list of possibilities and necessary changes goes on….

What is Australia's advantage? Technology lead times are generally not that important, since the life span of any given technology is so brief. What is difficult to catch up on (once the first mover gains an advantage) is relationships (with the "clients" of education and with partner institutions), as well as the "product" (course offerings) and administrative machinery. To gain the first-mover advantage in relationships, "products" and administration requires that an adequate infrastructure be in place. Whosoever shall lead in the new information age needs to create vision, gather the relevant players, and start now.

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