

## Strand 4: Networked Learning in Community Development

Paper 9:

# Chalk To Cable (Conquering the Tyranny of Distance in Australian Higher Education)

Dave Oliver, Jo-Anne Luck and Errol Vieth

Dave Oliver, Jo-Anne Luck and Errol Vieth  
Faculty of Informatics and  
Communication,  
Central Queensland University

### Summary

- Technologically advanced western countries have experienced great social changes since the end of world war two and higher education has been transformed. Many factors have had an influence, but the growth in technology and its social effects, along with governmental influences, appear the strongest. Higher education has changed from a small, exclusive, traditional, independent, privileged and detached sector of society, to one that is large, inclusive, innovative, regulated, open and integral. This paper explores both the social and economic trends inherent in the emergence of life long learning, and government attitudes and policy affecting advances in knowledge through the higher education sector.

The paper explores the dynamics of the Australian higher education scene revolving around a case study of how a small regional higher education provider, Central Queensland University (CQU) has developed as a networked institution, becoming the first Australian University to establish campuses beyond state boundaries. The expansion of CQU from a single site serving a predominantly local population, first into distance education, to multi campus operation, to overseas and inter-state operation is traced along with the implications of this transition on networked learning. Teaching techniques available for use in these changing contexts are examined. The student profile and its reaction to networked learning environments are explored. Experiences with networked delivery of subjects using e-mail lists, web delivery and electronic assignment submission are discussed.

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## The Influence of Technology on Public Policy

- Economic growth has been perceived as essential to increased social benefit by increasing private and government wealth. Economic strength is determined by natural resources, population and technology. Governments have consequently encouraged advances in knowledge, particularly technology, to promote national economic growth.

The higher education sector has been viewed by government as one vehicle for accelerating the progress of technology, and therefore promoting economic growth and national prosperity. "All developed nations have greatly increased the size and capacity of their higher education systems, as have developing nations, essentially for the same reason: the comparative advantage that contrasts with the extreme and obvious disadvantage to a nation if all skills and knowledge have to be imported" (i). The famous "clever country" phrase introduced by Prime Minister Hawke in 1987 "accepts a number of tenets including the continuance of major change to all facets of society, the dominant role of science and technology in any future social or industrial scenario and the role of knowledge and skills which will create "flexible and adaptable" people and organisations" (ii).

## Funding Mechanisms

- Higher education providers in Australia are almost exclusively publicly funded institutions. As a consequence the higher education market is highly regulated, with a uniform fee structure across almost the entire higher education sector.

However in the 1990's it is apparent that in Australia's current mood of financial conservatism there are some misgivings in government circles about the overall size of the higher education budget. "The link between the public investment and return on this investment in terms of visible national revenue has not always been clear and obvious to the tax-payers, or for that matter to the Government" (iii). There is also in these times of economic rationalism, less inclination to pursue

public good that results in private benefit. Commenting on the current Higher Education Review, committee member and CQU Vice Chancellor and President Lauchlan Chipman comments. "One of the most difficult questions . . . . is whether the benefits of higher education are primarily private benefits - benefits to the individual graduate - or primarily public benefits - benefits to society at large. The case for public subsidy is based on the idea that there is a significant social benefit. The case for requiring the student to contribute is based on the idea that a degree brings significant personal advantages, especially in job opportunities, total lifetime earnings, geographical mobility, and social class ('status') mobility"(iv).

These attitudes have contributed to a decrease in the level of government support for publicly funded universities. "Where once the Government provided about 90% of university funding in 1983, it now (1997) provides about 57%" (v). In Australia we are seeing increasing levels of student fees to compensate for the declining government contribution. Partial student fees were introduced under the Higher Education surcharge scheme (HECS) (vi) the intent of which is to lessen the burden of higher education funding to the government. In 1997 a differential HECS rate was introduced varying from A\$3,356 to A\$5,593 per annum depending on the course.

Other initiatives designed to expand higher education at a reduced cost have come from allowing non traditional providers into the market, namely the private Bond University initiated by the [failed] entrepreneur Alan Bond and the Australian Catholic University, both of which offer relatively specialised courses. Another recent entrant to the market, floated under government support but outside the conventional funding framework, is the networked Open Learning Agency which offers subjects from provider universities on the basis of an up front fee (A\$425 in 1997). This returns a fee to the providing university which is considerably less than would be earned by the university offering the equivalent subject to directly enrolled government supported students. "Open Learning Australia (OLA) has no entry requirements and no limit on places. It offers students the flexibility of studying ... 52 weeks a year and ... to pick and choose units without any requirement that they complete a whole course or qualification" (vii). In

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future we may see more new entrants in the Australian market, quite possibly from the emergence of a global education market. "As a result of the changes wrought by technology and shifts to demand based funding, power will shift to the consumer ... whether through price competition between providers, a wider range of choice, or greater flexibility in delivery etc" (viii).

## Lifelong Learning

- Populations have responded enthusiastically to the availability of higher education. Many occupations now require the possession of a higher education degree as a consequence of the complexity of technological society. This technological influence is pervasive, extending even to courses like Business and Journalism, which usually have information technology based subjects.

Society is experiencing increasing rates of technological change. This means that knowledge and skills learnt early in life are not always adequate for transformations in work practices caused by subsequent changes in technology. "Several factors have combined to change significantly what society needs from its tertiary education system. Foremost among these are the rate of technological change and the changing nature of work. The content of many degree programs is now becoming obsolete in two to three years. Most graduates can look forward to a number of major career changes. At the heart of the changes required is the mainstreaming of lifelong learning" (ix). When career interruptions occur as a result of retrenchment or other reasons, it is likely that re-entry to employment will require updated skills and knowledge. Life long learning is a response to this phenomenon.

As evidence of this trend in Australia the proportion of students enrolled in higher education aged 30 and over has remained steady at around 27% during the period 1983 to 1997.

## Institutional profile

- In the 1970s Colleges of Advanced Education (CAE) emerged as an alternative to universities, offering a set of courses in education, nursing, arts and business that were not generally offered by universities, or that were parallel to university curricula but with a more practical emphasis. The professional education market, the requirements of credentialling in fields like education, as well as the upsurge of interest in continuing education made CAE's a popular alternative to universities.

CQU entered the higher education sector as Queensland Institute of Technology (QIT) Capricornia in 1967 and student catchment was primarily confined to the local area of about 60,000 people. The campus was located at Rockhampton, situated between the university cities of Brisbane 650 klm to the south and Townsville a similar distance to the north. Many students could not afford the cost of residing away from home in Brisbane or Townsville, while the emerging student group of life long learners (such as workers, parents with childcare responsibilities, older people) could not afford to live outside Central Queensland either (x). In addition there was a perceived need to provide an educational service to the rich mining area of Central Queensland, specifically to provide technical training in the engineering and science disciplines that were core to the development of the mining industry.

QIT at Rockhampton became Capricornia Institute of Advanced Education in June 1971, initially offering degrees in Applied Science, Business, Engineering and Education, and later in Arts and Health Science. The geographical context of regional Queensland with its massive size and small population made distance education an appropriate response to community needs for higher education. Also, the credentialling taking place in many professions, the growth in the general education market, the interest in education for women, and the lack of external courses equivalent to internal courses in Australian universities, influenced the move to offer awards by distance education. CIAE was the first Australian provider of an external Bachelor of Applied Science in Physics and Chemistry in 1974 (xi). In the following year

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Biology and Mathematics were offered externally, as was the Graduate Diploma of Management. By 1983 external enrolments exceeded internal full-time and part-time enrolments, becoming a major source of revenue (xii). Most external students at this time were between the ages of 30 and 39.

Whilst the nature of distance education does not inhibit enrolment from interstate, the bulk of the students enrolled in distance education reside in Queensland. Experience has shown that whilst distance education is the only option for part time students living in regional Queensland, in practice many students actually live in Brisbane, the state capital, which is well served by higher education institutions offering part time courses. It seems that because distance education offers increased flexibility in time and place compared to on site education, it becomes a viable alternative.

To increase student enrolment in the mid 1980's and in recognition of changing demands, CQU decided to provide on site education in the main population centres of the region (initially Mackay and Gladstone). To some extent this decision was based on demonstrated interest from the towns themselves. They pushed for the establishment of campuses based on study centres for distance education students. Initially branch campuses were set up at Mackay and Gladstone where students could study the first year of a degree, and then move to the Rockhampton campus to finish the course. In practice some students transferred to other universities after their first year.

In part to arrest this process of attrition, in part to exploit the tertiary market that was being inflated by rising unemployment, in part to mark the university as a truly regional institution, the second and third years of some degrees were introduced on the other campuses. Also more campuses at Bundaberg and Emerald (350km to the south and west respectively) were opened. This resulted in a network of campuses serving a large geographical area of some 616,121 square kilometres. These new campuses were strongly supported by the local communities who contributed funds and/or land that could be developed. Hence the new Central Queensland University no longer has a main campus with four branch campuses, but rather has five campuses of approaching equality, where students can now study a complete degree, from a

growing choice of courses. In time it is likely, given the new communication technologies, that the importance of the Rockhampton campus will decline relative to the other campuses.

A more recent expansion has established sites in Sydney (1994) and Melbourne (1996) through a commercial association with Campus Management Services (CMS). These campuses represent an extension of the institutional network, as do a number of overseas centres, mainly in South East Asia. These overseas centres are essentially partnership arrangements with other educational providers, but extend the networked university concept both interstate and overseas.

## Student Profile

- From 1967 to the late '70s most students were full time, of local (ie Rockhampton) origin and were school leavers. The diversification into distance education at the end of the '70s saw a broadening of enrolment mainly in regional Queensland.

	On Campus%	Off Campus%
Outside CQ	18.3	61.1
Within CQ	81.7	38.9

Figure 1. CQU enrolment 1996

At the CMS campuses students are almost exclusively of international origin and also the Rockhampton campus has seen the emergence of a small but significant population of overseas students consistent with general trends in Australia. The economic effect of these students is significant. "The tuition fee income derived by universities from international activities is estimated to have exceeded A\$600m in 1996. While this is not net income, students generate additional income in the course of living in Australia. Total income received in 1996 (tuition, accommodation, food expenses) from overseas students across all education sectors was about \$2.6b. This places education services as Australia's fifth largest export"(iv).

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## Delivery Issues

- When CQU was founded, the notion of delivery systems was unknown. Lecturers expertise was delivered to students in a lecture room, using chalk boards, whiteboards, overhead projectors and other technologies appropriate to a student teacher situation centred on time and place.

Diversifying into distance education in the late '70s lecturers were required to present a study program using print media. This necessitated preparing the entire subject in advance, a significant paradigm shift for the educator. Internal students at branch campuses generally used distance education material, coupled with videotapes of lectures delivered in Rockhampton a day or two before.

The recently introduced [1997] Interactive Videoconferencing technology, used by CQU to network the Queensland campuses using interactive multi point video, has tended to reduce the remoteness of the lecturer, who, whilst predominantly based in Rockhampton, can be based elsewhere.

Use of advanced technologies such as audio tapes and videotapes have increasingly been used to supplement print, to cater for differences in student learning style, and to exploit particular media characteristics in particular contexts.

## The World Wide Web(WWW)

- "One of the advantages of the WWW over traditional print based distance education material is its ability to handle full colour photos, audio clips, and movies. This can add considerably to the value of learning material" (xiii). This has the potential to effect a profound improvement in the presentation of content.

The WWW is particularly significant as it provides multimedia delivery and students can now learn:

- "when they want - computer servers do not care when they are accessed;

- at their own pace - adjusted for learning style, ability, available time etc;
- whenever they want - next door or across the world from the server or university" (xiv).

Some commentators perceive "a move from classroom learning to network learning as education becomes a life long activity" (xv). The World Lecture Hall (xvi) is a compendium of higher education courses, across a wide range of disciplines, available on the www. Many universities are positioning themselves for www delivery, though in the case of CQU moves in this direction so far have been individual initiatives rather than a concerted plan. For many subjects the www can provide advantages compared to other methods. Apart from the issue of presentation and convenience, additional features of networked multimedia delivery that enable a more effective study experience for the networked learner are:

- access to Web based resources;
- increased contact with peers and tutors;
- faster turnaround of assessment.

Access to resource materials is particularly difficult for students located in Queensland. Libraries are difficult to visit because the population is widely dispersed. Although the WWW does not have a catalogued collection of materials, it is extensive and up to date, and has assets beyond that of most libraries. Research skills are cultivated through using the www to find information. For example at CQU the first year unit, Introductory and Contract Law (25142) (xvii) has links to sites in Australia which give access to the legislative acts of the Commonwealth and State parliaments and case histories of court decisions. Web access to these databases is available to all students both on and off campus.

Where subjects have been extensively designed to exploit web technology, it can become the dominant delivery paradigm. This tends to diminish the importance of lectures. For example the CQU unit Screen Studies (51215) (xviii) states in its preamble "Traditional weekly lectures will be replaced by a number of modules that will be located on the

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WWW and accessed via that medium. It's an exciting innovation and one that harnesses the power of the www to provide students with resources that would not otherwise be available to them. At the same time it redefines the notion of flexibility in learning." For subjects that are Web based the distinction between the different delivery modes becomes blurred. A world wide trend is apparent towards "a point at which there is no longer any significant division between distance and conventional education, when university education - as indeed at all other levels too - will be conducted by different means at different times according to the requirements of different groups of students and the resources available to different institutions" (xix).

However at CQU it has been observed that first year students who attend campuses expect to be taught by a real person. These students can become seriously disaffected by the learning process when exposed, early in the course, to very high requirements for independent activity, such as an exclusively web presentation, even when the material is not difficult. More advanced students appreciate the increased flexibility and independence available in a networked environment.

## Networked Interaction

- e-mail lists for class discussion have been used for some years in Information Technology units (xx). These students are naturally at ease with information technologies. e-mail lists are intended for students to raise questions relating to their study. Anybody can respond to the question, and just as might happen in a seminar, conflicting responses occur. A lecturer needs to monitor these lists regularly to make sure questions are resolved correctly. In the multi campus network at CQU, generally one lecturer or tutor is given the primary responsibility for monitoring the e-mail list. e-mail lists provide an unprecedented degree of interactivity for off campus students, enabling discourse in place of a vacuum.

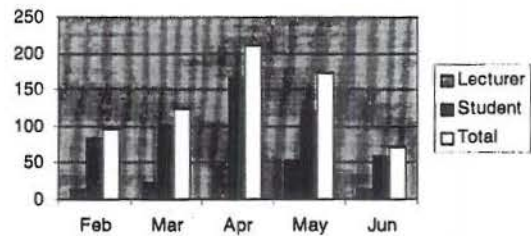


Figure II. e-mail list traffic 85101 Programming A 1997 semester 1 (First year subject, 220 on campus, 344 off campus students)

The capacity to both submit and return assignments over the network has been experimented with in three units in CQU, Software Engineering (85208) (xxi), Systems Administration (85321) and Operating Systems (85349). These provide an immediacy of turnaround unattainable using conventional mechanisms (xxii). At CQU, postal and bureaucratic activity will incur at least a one week overhead on top of marking time. Timely feedback on assignments is one of the most important aspects of the learning process. The networked classroom permits very rapid response. However the multiplicity of word processing systems, computers and encoding formats pose a variety of technical challenges, so apart from some exceptions, networked assignment submission is in its infancy at CQU.

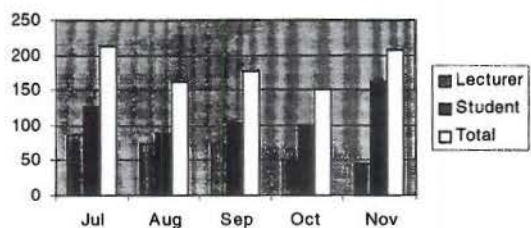


Figure III. e-mail list traffic 85349 Operating Systems 1997 semester 2 (Third year subject, 92 on campus, 152 off campus students)

## Institutional Structure

- At CQU Faculties bear overall responsibility for academic programs. This includes course and subject content, assessments, grading and subject materials. The Division of Distance and

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Continuing Education (DDCE) has responsibility for producing subject materials under the direction of academics in faculties, despatching materials to off campus students and the receipt and return of assignments. DDCE also has instructional design experts to assist in the creation of subject materials. Educational Media experts, particularly sound and video, are in another division and Information Technology with its responsibility for computing infrastructure including modems, e-mail and computer accounts in yet another division. Of course it is common for large organisations to be structured hierarchically and CQU is no exception. All these sections participate in providing networked learning facilities. It is clear that new approaches are required in order to provide effective networked lifelong learning and "Academic staff will have to acquire new skills in order to meet the requirements of providing open and flexible learning using the new communications technology" (xxiii).

## Conclusions

- Compared to Universities in Great Britain and Europe, CQU has had a very brief life, only 31 years young. In that time it has grown from a small regional offshoot of the Queensland Institute of Technology to a University in its own right, with a unique network of campuses and centres in Eastern Australia and South East Asia. It has been able, as a young and dynamic institution, to adapt to the new technologies for networked lifelong learning, such as the WWW, e-mail and interactive video-conferencing.

As we move into the 21st Century CQU and Australian Universities face many challenges:

- competition from both within and outside Australia;
- changes to Government policy as a result of the West committee review;
- efficient and effective utilisation of new technologies for networked lifelong learning;
- staff development issues to enable staff to acquire the new skills necessary to take advantage of the new communications technologies, and
- \* enabling students to exploit the opportunities for flexible learning made possible by the new communications technologies.

Flexibility and adaptability are the keys to answering these challenges. CQU has a history of using both these skills to its advantage.

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