

COMMENTS ON :

“Learning for Life : Review of Higher Education Financing and Policy - A Policy Discussion Paper”

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1. OVERVIEW

“ January 1889: Columbia College, New York, has decided to have a special course in electrical science, and not a moment too soon, for this has long been seen to be a department by itself, and, while allied to other



branches of natural philosophy, requires, at least from those who would adopt it as a profession, an undivided attention. In a practical age like this, the most valuable college instruction would seem to be the one that best resembles what its recipients are expected to accomplish outside of it.” (SCIA-89)

(Scientific American, January 1889 - Quoted in Scientific American, “50 and 100 Years Ago”, January 1989).

By the end of the 19th century, as can be clearly seen from the above quotation, the concept of a University in the USA was under discussion and the need to provide for professionally oriented education well understood. One hundred years later, and in Australia, the discussion paper asks us to look into the 21st century at the bases and forms of tertiary education that will be needed in the new millenium. The following comments take into account this broader “time-horizon” for the report.

2. OVERVIEW / GENERAL STATEMENTS BY THE CHAIR OF THE REVIEW COMMITTEE

INFORMATION TECHNOLOGY, INFORMATION SERVICES AND TERTIARY EDUCATION.

REVIEW CHAIR, INFORMATION TECHNOLOGY AND EDUCATION - THE SECOND OF "TWO PHENOMENA THAT DEMAND ATTENTION".

The discussion document identifies two "*phenomena that demand attention*", according to the Foreword by the Chair of the Committee. The second of these phenomena is clearly stated as "... *our eyes are being opened to extraordinary possibilities in the provision of education through ever expanding technological advance..*" These words are clear and decisive but in some ways seem to be ignorant of the more than 30 years of national and international work that has been done in the whole area of computer-based education and distance delivery via data network / telecommunications services. We are not speaking of new sources of data or information or technologies for the delivery of data or even information to assist in the education process. Rather Mr Roderick West makes the categorical statement that technology is to become basic to the "***provision of education***".

Understanding the Nature of the term "Education"

This submission challenges this assumption and submits that the policy discussion paper does not provide real evidence to support such a global and all encompassing statement. Indeed, while information technology (IT) can and does play a role, it may not be as central to the future as the Foreword makes out.

Indeed, it could be that the "*information glut*" that has become possible through such global technologies as the Internet, World Wide Web (WWW) and low cost personal computers, could have a detrimental effect on the bases of what is meant by education as a flood of information passes on to students worldwide. There is also a similar concern emerging that the use of Internet and computer based delivery systems are not suitable bases for the provision of a sound education. Simply, do they produce the "***education***" intended and desired ? How are "outputs" to be measured ?

The problem is summarised in the words of David Shenk from his new book "*Data Smog*" (SHEN-97) in the following way ;

"... The process of creating intelligence is not merely a question of access to information.."
Shenk, D. - "Data Smog"
Pg. 74-75, HarperCollins, 1997

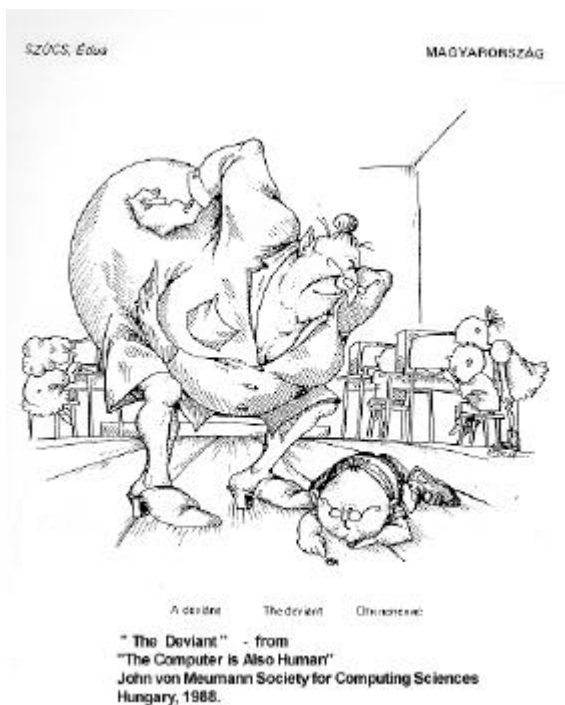
" .. to leap from the reasonable claim that computers can be a useful tool in education to an insistence that powerful high-speed computers are destined to revolutionize classroom education simply on the basis of their power and speed is to let the winds of technoutopianism sweep us away..."

Indeed, a 1988 cartoon from Hungary (given below - JOHN-88) presents this debate in a succinct way.

IT and Lower Costs ?

At another level, the discussion document presents the assertion that in the long term such technologies will lower the cost of delivery of “education”. This must be challenged in the following ways :

1. The discussion document presents no evidence that information technology has, can or will lower the costs of delivery of education in the tertiary sector.
2. It is equally arguable, from the discussion document, that indeed the widespread use of information technology in the delivery side of tertiary education may markedly **INCREASE** the costs associated with the vital **ASSESSMENT** and other required functions in tertiary education.
3. While the use of information technology resources in tertiary education appears to possibly increase education “quality”, such quality improvement is obtained at a **marked increase in total cost of delivery** of that tertiary education in terms of both start-up and continuing costs.



The “PLATO” Experience.

Interestingly the discussion document makes no mention of one of the largest attempts to use information technology for education purposes which was started in the 1960s at the University of Illinois in the U.S.A. under Professor Don Bitzer.

(See URL <http://www.xxlink.nl/plato1.htm>)

The project was called “**PLATO**” and it became, along with its special educational materials preparation language “**TUTOR**” and the associated “**Group Notes**” and “**Personal Notes**” sub-systems, a highly celebrated system in the 1970s and early 1980s with large scale commitments to it, for example, in Canada. The

University of Illinois work was taken up by **Control Data Corporation**, a Minneapolis, Minnesota, USA based corporation and developed into a commercial product.

As an adjunct to the main themes of the PLATO work, one of the first efforts was to try to place a definite accounting base around delivery of “education” and through this it pioneered work on costing of “courseware development”, “courseware maintenance”, delivery, assessment technologies and processes, and the like. PLATO is not heard of at all today. The highly costly PLATO experiment failed. The report needs to look further at

actual experiences in the past and the present before any real assessment related to cost benefits can be clearly derived.

Essentially, the use of IT in education can offer great advances in quality of educational output but only if it is not seen as a cost reduction process. Indeed, the use of IT for remote delivery of course information content could lead to the “funnel” effect whereby students are limited in terms of assessment, tutorial experiences, simple question / answer sessions, etc. At the same time, increasing student enrollment makes the assumption that the totality of the educational experience can benefit from the IT systems in use. This whole problem of network based education “outcomes” is clearly canvassed in the discussion documents of the United States Federal Department of Education.

(See Internet URL - <http://www.ed.gov/Technology/Futures/>)

If staff numbers remain the same, and there are no breakthroughs in computer-assisted assessment of the educational process, then simply put there are no cost benefits in the use of IT since the “*funnel*” effect simply limits the availability of assessment and allied, person-to-person requirements. At the same time, the “*MacDonalds*” effect could also occur. In this scheme students grow to expect the same level of prompt response and service possible from a computer system, but from the human teacher.

3. COMMENTS ON THE DISCUSSION DOCUMENT ON A CHAPTER BY CHAPTER BASIS.

Chapter 1. “ A fresh vision”

There is no doubt that the policy framework that governs the tertiary education system in Australia is under stress, stress which is rapidly increasing. In a way, this can be seen as a natural state of affairs as transition occurs in the overall sector. But the problem is a simple one, the “destination” of that transition is not clearly seen as yet. The system suffers from a mix of centralised planning imperatives (negotiation of an annual “profile” in a Canberra context), partial autonomy (selling of overseas positions and now local positions), and centralised Federal Government funding based upon a largely historical base (Universities with almost the same student numbers with widely disparate Federal funding) while most Universities operate under State legislation.

The following points address specifics in this Chapter.

- PRIVATE AND INTERNATIONAL COMPETITION IS A THREAT.

The statement that private and international competition “...*should not be seen as a threat.*” is simply **WRONG!** The recognition that it is a threat should be seen as a healthy situation, a situation demanding urgent consideration and attention. This factor has been emphasized by Time Magazine’s “*Man of the Year*” for 1997, Mr Andrew Grove of the United States’ Intel Corporation (TIME-98).

In his book, “*Only the Paranoid Survive*” (GROV-97) he clearly identifies the concerns that management must have when large scale changes occur in an environment where management in the past has expected slow and constant change. This is notably true in tertiary education where centralised planning and allied processes cannot handle massive swings in “customer” demand that are likely in the 21st century.



The ability of the USA’s Universities and other private organisations and companies to provide information services, presented as education, is massive. At the same time the lure of a USA or European qualification from a reputable source offers major competition to the majority of the newer Australian Universities, the “post-Dawkins” Universities. It can,

and will, “swamp” any Australian “industry” as has already happened in relation to film and TV production.

The report gives no evidence to suggest that in an English speaking environment, Australia’s universities can compete on a global basis for students against the capital resources of the USA and Europe. Moreover, at least in the USA the availability of venture capital for the information industry, including computer based education, has been proven. This is not the case in Australia at all.

Already, some German States have seen global engineering education as a major opportunity. Indeed, offering courses into Australia has been seen by Germany as a “stepping-stone” into the Asian and South-East Asian market. For example, the Malaysian Government’s choice of the German Fraunhofer Institute to investigate an “**Internet-based Lifelong Learning**” university for Malaysia is a case in point. (See Internet URL http://www.igd.fhg.de/www/pr/pi_1996/presseinfo_e3496.html)

As Australia’s film industry learned in the 1930s, the challenge must be seen as a major threat that may eventually limit Australian Universities to “niche” areas, as has already happened in the Information Technology and electronics industries. There is no evidence in the report that “education” is or will be any different to those industries and not suffer their experience of the last 50 years or more. The change is a “Grove inflection point” in an educational sense.

- “.. *inflexible framework...*”. The problem is basic. Perhaps it would be better if tertiary education funding once again was returned to the States, as is the case with TAFE. After all, the State Universities operate under State Acts with Federal funding. The tertiary education section of DEETYA and related Federal departments could be disbanded (cost savings) and the closer integration with TAFE, that appears to be essential for Australia’s future could be more efficiently handled. This may also be the only way to enable the administration of the Universities to take over full control of their operations in a business-like manner. The current situation is a “multiple-masters” situation that leads to incoherent policy formation on an institution by institution basis. The report **correctly identifies** and supports this view as an “... *inconsistent mix of institutional freedom and central control...*” That “central control” includes both State and Federal Government at present.

Chapter 2. “ The future operating environment”

Digital revolution...

The problem with this section is that communications and information delivery via information systems are being equated with education. Distance education has been a major factor in Australia for almost 100 years while the “school of the air” extended this whole concept to the radio age for school children. While IT systems may allow for the presentation of data and information materials to the student, along with provision of electronic “chat groups”, bulletin boards and the like, this, as has happened in the past, will be at a major cost penalty to the institutions.

The Internet.

This section makes a vital but possibly unintentional point. It refers to the removal of a major distance education problem by use of the Internet, i.e. the problem of interaction of a student with University staff and other students. This assumes that the staff member will have the time in the future to reply to, audit, control, monitor, lead and generally supervise such interaction.

These IT based schemes can be equivalent to ONE-ON-ONE TUTORING.

It is extremely costly and is not the norm for on-campus study where larger tutorial groups and lectures are becoming standard. The management problem on the Internet is enormous. Whereas a tutorial session, for example, may bring together a staff member and a group of say 25 students into a single session at one time and location, the Internet means that a staff member may be required to respond in an individual manner. Quality of service may go up but the tertiary budget is nowhere near being able to afford such luxury.

Responding to the challenge

This section gives a “feel” for the size of the problem to be faced. The report envisages almost universal access to tertiary education as a norm in the 21st century but is unclear on just how a country such as Australia will be able to afford this. The use of IT and telecommunications seems to be an almost “*clutching at straws*” approach and, as indicated later, there appears to be little evidence to support that this technology should or is capable of providing the answer, at least in economic terms.

Chapter 3. “The current policy and financing framework...”

Equity

The problem here is a common one. A Government must consider the problem of access and fairness while previously Government owned and operated activities are privatised, e.g. Telecom/Telstra.

Where does business activity stop and social considerations and responsibilities start ?

In the past, for example, cross subsidisation of country phone calls from profits of city / business activity was a major part of the telecommunications philosophy of many countries, including the USA, Australia, New Zealand, UK and elsewhere. If this report is to be consistent, then the only way to approach “equity” would be to separately cost it out as a social benefit and allow for places in Universities to be “bought” for nominated groups, once the tertiary sector is seen, as in Chapter 1, as an “industry”.

In this scenario, Vice-Chancellors and Councils of Universities act in a businesslike manner with the “social policy” created, as it should be, by representative Government. This also applies to “cross-subsidisation” between courses within Universities where individual Faculties may easily fill positions while others may have difficulty in existing. Once a “business-like” approach is adopted then that approach has to be **consistent** across institutions and within institutions alike. At the same time, the ability of University

management to fill positions in “in-demand” areas, such as Information Technology, Business, Telecommunications and Networks, Healthcare, etc. will be under severe strain.

For example, in the information technology area today most lecturer and above positions are offered with salary packages not only well below (half or less ?) of equivalent private sector positions but even less than equivalent positions in the usual public sector ! This has been clearly exemplified by the reported inability (or difficulty) at the University of Sydney to fill a Chair in Data Networks, even given private sector support. The remuneration package was seen in the industry as being at least half what an equivalent private enterprise position would offer !

The devaluation of the Australian dollar against the US dollar and major European currencies also means that academic positions in Australia, for the foreseeable future, will be markedly less attractive to top overseas people. In reverse, overseas positions will appear better to top Australian academics.

Thus, the education of our nation depends upon the good will of members of academic staff to a level not seen before.

A focus on institutions, not students.

There is no doubt that the system cannot cope with massive and sudden change in market demand, e.g. in demand for courses in data communications, telecommunications technologies and engineering, electronic commerce, and the like. Expansion of demand of 100% per year has been seen at the Queensland University of Technology in this area.

Chapter 4. “The way forward...”

Research policy

Setting national policies. YES !

There is a requirement to “pick winners” but these winners may not be, and usually are not, based on “our strengths”. This “strengths” concept is based upon the perception that strengths equate to markets. This may not be true at all ! Australia may possess some particular research strengths, e.g. nuclear physics, surface physics, etc. that are totally disconnected to long term industry development or even to perceived international markets. For example, computer software is a major international market, but it has only been in the last few months that the need for national software engineering research infrastructure has been acknowledged.

Block Grants.

In many sectors, the infrastructure costs of participation in leading research are large and getting larger. There is no other way to go than to identify winners and to move to the “**high impact**” model. Anything else means that scarce capital resources will be too finely divided to have any real research impact in a global environment.

Re-emphasizing the ANU as a Premier research centre.

This means that an emphasis should be given to the re-establishment of the original philosophy of the Australian National University / Institute for Advanced Studies. As a small country we need a research “icon”, a place of learning and research that can be seen clearly by Australian and international academics and researchers as “*the top place*” to be.

The provision of a flexible research fellowship scheme for University researchers at other universities, e.g. 3-5 year secondments to ANU, is the way to go for the 21st century.

While research and scholarship are to be encouraged there is no way that Australia can afford 37 or more full research Universities with international reputations in even a few, specialised, concentrated areas. Under current arrangements the situation with the ARC will get more and more untenable. Success in applications for grants is now seen, anecdotally, as being essentially a “*random event*”. The above ANU concept presents a different approach to the research equation.

Chapter 5. “Making the transition”

Capitalising the industry.

“... advances in information technology and telecommunications should enable the higher education industry to achieve declining costs in the longer term...”

NOT PROVEN.

THERE IS NO EVIDENCE TO SUPPORT THIS ASSERTION.

Once again, this statement mixes up the concept of education, life-long education, and information / data presentation and access, as illustrated in that late-1980s cartoon from Hungary (JOHN-88) above. While the costs of running a traditional 250-student lecture in a lecture theatre may be calculated, even given capital amortization of the theatre itself, and still be low on a per student-hour basis, this is not the area of major cost. Examination, assessment, small tutorial group operation, student consultation with tutor/staff member, etc. are all high cost areas since they are by their inherent nature, inter-personal and people intensive.

Once again, Shenk (SHEN-97) is worth quoting as follows :

“... The process of creating intelligence is not merely a question of access to information... Education is about enlightenment, not just access....”

With student-to-staff ratios in some universities, such as the Queensland University of Technology, equivalent to those for high-schools at 25 students or more to one academic staff member, any cost savings in the long term from the introduction of IT could only be minimal anyway, while immediate one-time and continuous enhancement costs may be high. (These numbers simply mean that any IT savings are minimised by the sheer ratio that already exists. You simply are at the acknowledged limit now !)

This matter of access to initial capital has been correctly identified by the committee BUT NO SOLUTION TO THE PROBLEM IS PRESENTED. Such capital is essentially identifiable as being in the “*venture capital*” arena, an area where Australia has an extremely poor record as clearly identified in the 1997 Goldsworthy Report. It would be far easier to let the private sector provide the buildings and land for Universities of the future on a commercial lease basis than to try to persuade Australian financial institutions to provide capital for IT infrastructure and associated software / courseware. One only needs to look at the problems of the Australian software industry to understand the problem !

Bandwidth and Costs.

The overall costs involved can be readily assessed from just one paper delivered to the “International Conference on Computers in Education”, 2-6 December 1997 held in Kuching, Sarawak, Malaysia. In a keynote paper by Z Ismail (ISMA-97). This paper, on multimedia in education, states :

“... If a fast response time is required say less than 100ms, then a bandwidth of easily more than 15 Mbps will be required. When shared data paths and multimedia signals are considered, then the information highway needed has to be a real super one...”

Indeed, this conference, ICCE97, identified the use of traditional postage of CD-ROMs to students as a major activity for the foreseeable future. Nowhere in the Proceedings of this most recent international conference could any reference be found to actual costs savings to be made by the use of IT in Universities! Indeed, it would appear that cost saving is NOT SEEN as relevant in this environment. Rather it is quality of participation that is emphasized.

A 1994 ASTEC report (ASTE-94) entitled “The Networked Nation” clearly identified this bandwidth problem. It stated (Section 4.2.3 under “Demand for Network Capacity”); *“For services to be supplied at acceptable performance levels, adequate network capacity is required (at the local, metropolitan and wide area levels). Insufficient capacity will lead to congestion, which can cause delays in transmission and dropped packets, which have to be re-transmitted, leading to further congestion.”*

While posting a CD-ROM to students with course related information materials may assist, the main problem is the requirement for bandwidth to provide for Internet based (for example) tutorial group formation, “chat” groups, voice and image transmission, and the like. These need to be provided to the desktop of the student participating in the course, in the ultimate case. However, use of “tutorial centres”, such as high schools during the “afternoon shift”, could help in this regard but, in principle, this does reduce the ultimate “distance education” philosophy and disadvantages those who do not have access to such tutorial / examination centres. Low cost access a high bandwidth to the home has not yet happened in Australia. Cable TV systems are not suitable for this purpose since interconnection is required. The question is whether or not such services will become widely available, at reasonable cost, over the next 20 years or so, the duration of this report. The questions are largely not technical but rather economic !

Venture Capital and the Education Market.

There is no reason for the committee to believe that the private sector, with no internationally recognised record at all in the venture capital area (as readily identified by the “Goldsworthy” Report to the Australia Federal Government) will play any role in the provision of the necessary capital to enable Universities to create and then maintain, the systems and content needed for distance delivery of the information and data parts of the education process. This will of necessity be a major capital requirement to be met by Government. There is NO OTHER IDENTIFIABLE CHOICE at present or in the foreseeable future.

4. Some Overall Comments and Possibilities.

Regional Centres at the Discipline Level.

The study of information and telecommunications technologies and engineering presents a good case for radical analysis of demand and cost containment through integration. There is emerging a need for a broad spread of competence in this arena, ranging from advanced high-school courses (Grades 11-12) to TAFE education and specialised, short term training courses to full graduate and post-graduate education.

The time is right to consider, as outlined in an ASTEC report of 1996 entitled “Australia’s Science and Engineering Base for Information and Communications Services and Technologies” (ASTE-95) the concept of regional discipline based centres. Under this concept, individual information technology disciplines at Universities in major centres would cease to compete and rather merge into a single education and research entity with associated benefits of scale. For example, given that major funding for the period under consideration by the review, still remains with the public purse, the minimisation of administrative overheads and re-invention of courses could be a major result. At the same time, the efficient re-use of courseware and like laboratory equipment and space could be optimised across a broader range of educational activities.

The coupling of such a regional centre complex in a specific discipline with Internet based courseware delivery could be a start towards achievement of new goals in education in Australia. The use of district schools, e.g. after normal school hours, could also handle the vital human contact sections of the educational experience through small tutorial groups, examination and assessment centres, etc.

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