

Time and tide: Teaching and learning online

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Abstract

As 'flexible delivery' becomes a synonym for Web-based delivery, the West Report exhorts government to increase productivity and decrease costs through greater use of communication and information technologies. Many Australian vice-chancellors are diverting more of their shrinking budgets to computer infrastructure and redevelopment of curricula to an online environment. The university sector seems set to follow the banking industry into the digital 'distanced' future, distanced, that is, from its 'clients'. This paper traverses the pedagogy of online education, its costs, and the philosophical aspects which West has not addressed.

Turning the tide?

In the popular version of the story, King Canute tried to halt the incoming tide. The more informed — or the better taught — know that Canute in fact was demonstrating to his fawning courtiers in the early 11th century that neither his royal authority nor his ferocious fighting skills could control the power and laws of nature. Time and tide are inexorable forces. Teaching and learning online is equally unstoppable, and it is not the purpose of this paper to attempt to turn back the digital tide which has breached the walls of academe. Like Canute, I recognise power when I see it. I welcome the harnessing of the power of communications and information technologies (CITs) to enhance teaching and learning, and to enhance the efficiency of the many non-teaching and learning activities in our universities. However, the simplistic assertions of those driving online education, including the West Committee, in relation to technology and its revolutionary impact on universities demand correction, like the popular version of the Canute myth.

There are legions of enthusiasts in the business sector, and some within universities, who exhort higher education administrators and teachers to convert to 'e-education' urgently lest they lose their 'competitive advantage'. The 1998 Evaluations and Investigations Report commissioned by DEETYA, *New media and borderless education* (Cunningham *et. al*, 1998) quotes Robert Threlkeld, Dean of Learning and Technology at California State University, warning that universities which ignore technology 'will begin to be seen like a rock in the

river... campuses will become smaller, poorer, and more marginal to the social mainstream' (p. 195). Dennis Jones, National Centre for Higher Education Management in the US, stated 'Technology is the silver bullet — the solution to all possible problems. There are very large student numbers expected, and not enough money to support them. The solution that's easy... is technology' (p.153). And in Australia, an investment banker based in Tokyo, *aka* Global Alliance Limited (West, 1997, Appendix 11), appears to have persuaded the West Committee of the urgency of a wholesale shift to online education as a solution to the funding question West was asked to address.

The West Report has been criticised for the narrowness of its focus and its limited analysis of higher education. However, it should not be forgotten that its brief was circumscribed: it lacked the luxury of time that the Dearing Committee was given in the UK, and its primary function was always to find ways of reducing the public funding of an expanding higher education sector. Although its broad Terms of Reference place funding last among its tasks, five of the ten reporting requirements are funding-related (West 1998, p.177-9). In the current government climate, it is therefore unsurprising that West's core recommendations are 'the silver bullet', and shifting costs to the 'users', identified by West as students, not business or the community as a whole through taxes. However, the Report exhibits a naive faith in technology as the simple solution to a complex social and cognitive activity — education — which is not amenable to easy 'solutions'. It takes a technological determinist position, couched within a market-oriented ideology, which demands scrutiny and rebuttal.

In *New media and borderless education*, we identified five core issues which would determine the possible entry of telecommunications companies into a globalised higher education 'market': pedagogical issues such as the nature of learning and higher education; practical issues such as costs, 'branding' and profits; philosophical issues such as access and equity; policy issues (dealt with by Tapsall (1998) and Flew (1998) in this issue) and personal matters such as the desire to learn from technologically-mediated resources.

Many of these issues also relate to the more general matter of online education, but I intend to examine in this paper only a few: the cost-effectiveness of computer-assisted learning; the pedagogical issues of 'distancing' students through online education; and the question of access and equity attendant on any move to large-scale online education.

Costing technology

West uncritically accepts Global Alliance's dubious estimation of \$500 million for development of online materials for half of the first and second year subjects in a 'typical' Australian university (West 1998, p. 22, 103). This putative figure is presumably based (from figures given elsewhere in the Global Alliance Ltd paper) on US\$10 million per subject and 100 first and second year subjects. Leaving aside the question of whether a typical Australian university exists, the GAL/West estimate is patently absurd: at QUT, a largely undergraduate university, there are approximately 2000 first and second year subjects. (Perhaps one should not reveal such numbers, lest it lead to claims of 'too much choice' and further rationalisation of subject offerings!) Divide \$500 million by 1000 (half the subjects on offer) and we're down to \$500,000 per subject for development and/or purchase and adaptation. Contrast this with the 1994 study of Richardson, Pemberton and Duncan (quoted in Boddy 1997, p. 344), which gave an indicative cost of \$10 million for development, but excluded 1428 hours of authoring, and infrastructure development, as well as fine-tuning and testing after the implementation phase. Clearly we are dealing with the perennial question of the length of a piece of string.

The GAL paper itself notes (GAL 1997, p. 47) that even a subject with only 'passable commercial values' will cost about US\$6 million to develop (based on ten modules at US\$600,000 per module) and half that per annum to maintain. Yet there is no acknowledgment in West of the maintenance costs (in terms of regular updating of hardware, software and maintenance of the materials themselves e.g. checking that hypertext links are current, incorporating new interpretations and recent events) of online materials. Notwithstanding the ease of many authoring programs today, incorporating new materials is not as simple as slipping a few new sentences into an oral lecture. In one of the 'mega-universities' West quotes with approval (West 1998, p. 63) - UK Open University - learning materials must remain basically unchanged (except for date changes etc.) for 8-10 offerings, i.e. two 'runs' per year, for four to five years, to be cost-effective, even where the basic form of delivery is print. Are we to leave online materials for four to five years before updating them?

At the 'consumer' end, GAL posits a possible fee of US\$1,000 per student for a 'standard' subject like Economics I 'delivered' by a 'low-cost on-campus computer-

mediated producer in Australia', US\$4,000 if there is a 'world class professor' at a 'Harvard franchise in Australia', and US\$100 for a fully online subject delivered to India with limited local support. Ignore the morality, and the pragmatics of the cheap Indian course and the Harvard franchisee — the GAL argument is that our cost-conscious Australian student of Economics I, with some access to an on-campus tutor, can have a cut-price subject fee of A\$1,800 (at current exchange rates). Yet the HECS rate for both on- and off-campus Economics I study at present is A\$420. Some cost-cutting — unless we presume that individual subject fees are to escalate dramatically as government funding further declines! All estimates seem to be predicated on a minimum enrolment of 1000 students (West 1998, p.144), which is far from 'typical' of first and second year enrolments except in subjects like Economics I. We might fear more for the future of our small enrolment subjects, and indeed West foreshadows a scenario in which small-enrolment subjects might be entitled to apply for competitive funding if it could be demonstrated that their retention was in the national interest (West 1998, p. 146). Who will decide, if not the experts in the discipline, whether Latin, Sanskrit or Astronomy are in the national interest?

Both commercial operators and institutional fees appear to cast doubt on GAL's figures. For example, *New media and borderless education* discovered this advertisement for Real Education, a US-based firm:

Here is our new pricing that only requires \$10,000 down for a campus, all hardware, software, Internet connectivity, technical support for all students, faculty and staff and we do the conversion of 20 courses from on campus to online. Using this pricing you can show a surplus in year one or two.

Our current price is \$100,000 for all features (28 in total) of a full online university and twenty courses (with 22 instructional strategies) translated from on campus to online. We then charge \$120 per student per three credit hour course for delivery, tech support, Internet bandwidth for the delivery and all hardware and software upgrades.

Example 1: 20 courses plus the full campus for \$100,000 if agreed to by Sept 1 1997. You put only \$10,000 down. The delivery fee is \$175 for the first 1800 students and then \$125 for all additional students. We use the first \$50 per student for the first 1800 students to pay off the \$90,000 not paid up front. We will not charge you any interest on the \$90 000. (quoted in Cunningham et. al. 1998, p.136)

At local level, the 1996 full fee per subject at the University of Southern Queensland's Graduate Certificate in Open and Distance Learning (set after development costs of over \$1 million were provided by the giant US telecommunications company AT&T) was set at \$825;

delivery costs were established at \$800 per unit, predicated on 100 students. It is a small profit margin, off a low volume base, one-tenth the size GAL posits as economically feasible. Either USQ has not properly costed their delivery, which West often enough suggests is typical of universities (West 1998, p. 53), or education is not necessarily a volume industry. GAL's own cost comparisons (GAL 1997, p. 55) reveal that online tuition fees at Washington State University and Phoenix University are higher than on-campus fees. And *Learning for Life* appears not to have done its own homework on costs: it refers to the Open Learning Agency of Australia as a low cost alternative to universities (West 1998, p. 88). Yet OLA's fees are currently higher than HECS, partly as a response to government insistence that it be self-supporting; further, OLA used the 'purchase in and adapt' option for many of its subjects, a course of action promoted by West as economically sound, and its costs are predicated on print as a primary delivery vehicle.

It should be clear that costing online teaching and learning is no simple matter, notwithstanding the GAL paper's 'demonstration' of the cost efficiencies of computer-based courses. Cost/effectiveness arguments such as GAL's obscure two core issues:

- the absence of valid analyses of costs *vs* effectiveness of learning programs, surely the *sine qua non* of university learning
- the contradictory premises on which models of education derived from neo-classical theory are based (cf. Flew 1998 in this volume).

In *New media and borderless education*, we considered in some detail Cukier's (1997) pertinent article on cost-benefit analysis in relation to online education. We point out that:

- There is no agreement on the definition of 'benefits'. For example, at the pedagogical level, there is no rigorous, long-term whole-of-course evaluation of learning outcomes (even rendered in the crudest terms) of online education; the research to date consists of small scale, subject level evaluations which demonstrate 'no significant difference' in outcomes (see Cunningham *et al* 1998, p. 133, cf. summary of 218 reports at <http://tenb.mta.ca.phenom/phenom.html>). However, as Wills and McNaught (1994) point out, it is impossible to alter the learning environment without also altering the objectives and therefore the assessment, which renders questionable any direct comparison of 'conventional' (face-to-face lecture/tutorial) and online teaching and learning. Other commentators argue that cultural and social 'by-products' of any educational process must be included among the benefits. Mason suggests that 'institutional renewal' in the form of a re-invigorated staff and culture must be taken as a

beneficial 'unintended consequence' of a move to online delivery (Mason 1998). A California State University project includes a drop in pollution as a 'social saving', a major factor in Los Angeles, but perhaps not so compelling a benefit in Rockhampton!

- There is no consistency in cost assessments in the literature. The figures outlined above give some indication of the wildly disparate costs being quoted. Certainly in our experience, staff development time is only ever notionally accounted for, and since all studies (e.g. Hesketh *et al* 1996, Boddy 1997) indicate that staff report significantly higher levels of preparation time for online materials development, that is a not-inconsiderable hidden cost. Training costs for staff and students are rarely included in calculations. And ongoing maintenance costs of infrastructure and programs are equally ignored.

However, I would like to suggest another 'cost' which has not been considered in any of the literature thus far, except tangentially, and that is the cost to the institution as well as to students of the inevitable band of 'cheap, part-time gypsy and online teachers' (DeBats and Ward *The Australian Higher Education Supplement*, March 18 1998, p. 38; cf. Schrecker 1997). Of course, as West argues, the universities will have more 'flexibility' in their staffing and this will reduce labour costs (West 1998, p. 19). But what effect will the 'hot desks' now fleetingly occupied at outlying campuses have on staff morale? Will it lead to a greater staff turnover and therefore more hiring costs? Will students who are restricted to an hour or two of a visiting tutor's time at a revolving chair be inclined to seek out that tutor for any face-to-face communication? And if most Australian universities teach the same Economics I unit, how do alumni associations convince graduates to donate to a 'home' alma mater? Already La Trobe and Flinders universities have joined forces with universities in eleven countries to pool their Internet courses and curricula (*The Australian Higher Education Supplement*, June 3 1998, p. 40). The University of Sydney and University of NSW have joined their graduate management programs. As an alumnus, which institution do I endow in gratitude? Further, how does a regional community quantify the social and cultural benefits of a 'physical' university in its midst? It may keep its young people at home via distance education, but it is questionable whether towns such as Wagga Wagga and Rockhampton would happily sacrifice their universities to electronic access.

West does not consider those questions. Nor are they often asked in the academies, at least out aloud. For example, the 14th Annual Conference on Distance Teaching and Learning, held at the University of Wisconsin at Madison in early 1998 had no keynote speakers who dealt with the issue of costs, whether financial or

social. Of its 25 workshops, one was dedicated to analysis of cost benefits and one was a company presentation on how low costs could become with Web-based courses. Our assessment in *New media and borderless education* was that, almost inevitably, the costs of online education will be shifted to students. The 1998 decisions of many Australian universities to charge for off-campus online access is a pointer to further 'user pays' decisions.

The second core issue is the contradiction inherent in arguments about economies of scale in relation to educational provision in a 21st century environment. It cannot have escaped the notice of the West Committee members that the Information Age they herald is a Post-Industrial Age. Certainly, ardent promoters of electronic technologies emphasise the potential for meeting the needs of highly segmented, 'custom' or niche interest groups. Yet the net result of the West recommendations and scenarios is unquestionably to *reduce* choice, to return to the Industrial model of supply, already too evident in 600+ lecture halls and minimal tutorials. West dismisses the argument for different courses glibly: 'this argument is difficult to sustain where subject matter is largely standardised across institutions and no longer subject to academic debate' (West 1998, p. 61). Many disciplines are hotbeds of academic debate, especially where discipline edges are blurring — and perhaps nowhere more so than Economics 1. This is not to endorse the infamous 'not invented here' syndrome, which has, in truth, stymied efficient use of valuable resources for teaching and learning. But a more important reason for the failure to share resources across the system is 'I didn't know it *was* invented!'.

The potential of the technology is to offer greater customisation to accommodate different learning styles, to promote decentralised, open and interactive communication. But such individualisation of materials comes at a cost. The basic argument of *Learning for Life* is therefore flawed: on the one hand, standardised online courses can accommodate a digitised world's educational needs through economies of scale; on the other hand, the core premise of the Post-Industrial Age, the Information Age, is choice, multiple perspectives, individualisation and customisation of goods and services. (For further analysis of the contradictions and ethical dilemmas raised by globalised, technologically-mediated technologies, see Evans 1995, Campion 1992 and Renner 1995.)

In summary, unless the entirety of benefits as well as costs can be factored into online education, there can be no valid analysis of the cost-effectiveness of computer-assisted teaching and learning.

Pedagogy and online learning and teaching

Learning for Life avers that its core rationale is 'student-centredness' and that its recommendations derive from concerns that the student 'client' has been neglected in

university education. However, linking student centredness to a move to online education produces some spurious or at the least contestable assertions.

1. Students are demanding more technology in higher education so their courses are relevant to 21st century careers.

True. But they are **not** demanding that technology as a substitute for face-to-face teaching. Nor are they demanding off-campus education: the proportion of off-campus enrolments, traditionally defined, has scarcely increased over the last decade, at 10-13 percent, despite the greater number of external courses on offer, and the advent of the Open Learning Agency of Australia. The exponential growth has been in part-time study, which at least until recently, remained class-based. Distance education research (e.g. Dodds, Lawrence and Guiton, 1984; Ryan and Scriven, 1993) consistently reveals that most externals would prefer to study on-campus. External students value the opportunity to undertake study despite their geographical and lifestyle circumstances, but they express the desire for more opportunities for face-to-face contact with teaching staff and other students. What students appear to want is the choice of location independent resources and face-to-face classes (Jones and Jones, 1996).

2. Students are complaining about the quality of their teaching.

Partly true. Course Experience Questionnaire (CEQ) data for the last few years reveal a disturbing level of dissatisfaction **in some discipline areas**, and **in some universities**. However, the McInnes, James and McNaught (1995) study of the first year experience at Australian universities, like the more comprehensive Pascarella and Terenzini (1991) US study, demonstrates conclusively that students value the lecture and the tutorial highly as learning experiences.

3. School leavers are adept with the technology and contemptuous of teaching which does not utilise it.

Partly true. However, many public schools and large numbers of private parochial schools have extremely limited computer facilities. Formal computer education is still often limited to a semester length course in first year high school, and although students are encouraged to use the Internet for research, they are often unskilled in assessing the worth of their searches and in any but the simplest computer functions. Universities face a huge challenge in accommodating the range of preparatory learning skills their students bring to higher education studies; they face curriculum decisions on how best to teach the technology and computer-literacy skills needed for successful learning in the Information Age.

4. Online teaching and learning would ensure that students had access to the world's best teacher in every subject.

Huh? Who's going to identify this guru? Then who's going to pay her? And how will she respond to 1,000,

10,000, 100,000, 1,000 000 students? After all, it is now acknowledged that interaction between teacher and student, and feedback from the teacher, is a core element of learning (Laurillard 1993). And that good teachers are those who respond to their individual student needs, based on a close knowledge of the student. Harvard's best teachers may not be the best for Chinese students in Beijing. Indeed there is a growing body of evidence of the rejection of generic distance education courses even within supposedly united 'economic regions', such as the European Union, because of resistance to this form of cultural imperialism (Field 1995). The Keepes *et al* (1993) evaluation of the TV Open Learning Project also reported greater student satisfaction with local programs rather than imported materials. As Evans (1995, p. 260) points out, 'the lure of the new computer, communications and transport facilities is that they entice...educators to...in effect, globalise their practices'. But *teaching* Physics 1, as opposed to the 'subject matter' of Physics 1, is a social and cultural activity, and as such may not be capable of global 'delivery'. There are also linguistic and political dimensions to teaching which mass online education cannot hope to address.

5. "In the Information Age, universities are not the only source of knowledge (of course they never were); the Web offers far more information than any lecturer could possibly cover. There is no longer any 'canon', and universities should therefore concentrate on simply teaching students how to learn, and how to access this information-rich environment rather than focussing on content (West 1998, p. 46)."

Oh dear. Regrettable as it may be, for the moment universities retain a 'gate-keeping' function: one of their purposes is to attest to a 'common' level of knowledge relevant to a particular society. This gives Australian residents an assurance that their doctors and engineers for example have a 'common', minimum level of knowledge (including 'content') and expertise. There are indeed many ways of getting to that common knowledge, and as educators we should acknowledge and accommodate those ways more than we have done in the past. But that is not to deny the core knowledge in any discipline area. Moreover, there is a tension, as yet only tentatively explored in the literature (e.g. Swann 1995), between constructivism (the belief that learners construct their own meaning from data) and the notion of assessable 'common knowledge' in a discipline.

6. Learning is enhanced by the interactive nature of online materials.

A moot point. Clicking icons no more *of itself* stimulates learning than entering a library. Learning depends on the motivation of students and the nature of the materials they engage with. Many current online materials are simply static pages with a few hypertext links and a constrained pathway through the text. Even in those

materials which allow interactive manipulation, e.g. dry lab programs, student 'choices' are often severely constrained by technical imperatives. We are as yet in the early stages of harnessing the real power of computers for simulation, multiple pathways and learning links. *Improving* the quality of learning via technology rather than merely replicating what we already do is both expensive and time-consuming.

7. Learning will be revolutionised by the new technology.

Leaving aside the question of whether evolution is preferable to revolution, the question of how we use the technology is of more concern to me as a teacher. I fear that we have given insufficient thought to the second-order consequences of technology in all its forms, and that our planning has failed to examine what it is that we value about 'traditional education'. As social commentators such as Birkerts (1994) note, technology of itself creates systems which effectively close off other options and generate often unpredictable results. Birkerts summarises the gains and losses of what he calls the electronic age as he sees them in his students:

Among the gains are 'a) an increased awareness of the "big picture", a global perspective that admits the extraordinary complexity of interrelations; b) an expanded neural capacity, an ability to accommodate a broad range of stimuli simultaneously'. These are powerful capacities for meeting the needs of a complex multi-relational world. But what are the losses? Birkerts says his students have:

a) a fragmented sense of time and a loss of the so-called duration experience...; b) a reduced attention span and a general impatience with sustained inquiry; c) a shattered faith in institutions and in the explanatory narratives that formerly gave shape to subjective experience; d) a divorce from the past...; e) an estrangement from geographic place and community... (Birkerts 1994, p. 27).

As educators, I believe we owe students and society a greater duty to consider how we might minimise the losses and maximise the gains attendant on technology within the university system. We need more public debate within our institutions about the 'deep content' of our courses, the very meaning of education itself.

Access and equity

I will not rehearse the standard arguments about equity in relation to computer accessibility for low socio-economic students, women and Aboriginal students. Recent ABS statistics (1998) on home access to the Internet demonstrate that point well enough. Some individuals within those groups will manage to access online educational services. My concern is that the 'no frills' online 'low cost option' of higher education will be an impoverished, 'distanced' experience of learning, in which the subtext of the technology is that the disadvan-

tagged are to be confined to a 'virtual' community, working through a 'dumbed down' curriculum which almost invariably will focus on content. In this 'option', learning support services such as libraries and tutors attract a surcharge, much as OLA charged additional fees for tutorial contact. This it seems to me, is the real danger of the 'no frills' education which Kemp (1998) argues will increase access. Access to a low quality degree is no bargain, either for the student, society, or the next generation: it is not 'equitable'. The putative cost savings of online teaching and learning can only be achieved if quality is compromised.

Conclusion

Online teaching and learning as conceived in the GAL paper and *Learning for Life* is not a pedagogical imperative, notwithstanding the minimal rationale mounted in the respective documents in relation to efficiency and effectiveness of learning outcomes. Indeed there is little consideration of pedagogy in either document. Nor does either demonstrate conclusively the cost benefits that might accrue if education were to be enhanced, rather than replaced, by online teaching and learning. There is no evidence that online education would be equal in quality to current educational experiences. As Renner argues:

a careful educational response (to technology) should emphasise local participation in the design and implementation of flexible educational technologies. Imposition of programmed curricula on staff and students will do little to inculcate higher levels of educational quality or democracy either for academic or student (Renner 1995, p. 299).

Kemp has criticised Australian universities for the sameness of their missions (Kemp 1998). Whatever missionary position they adopt, it seems that our universities will be driven to sameness in the takeup of technology by central policy and funding decisions, through the inevitability of collaborative development and sharing of learning materials, unless we find ways of differentiating our mix of learning experiences for our students.

To return to our Canute myth. Education, unlike gravity, is not a physical phenomenon, to be manipulated for mere economic gain. Nor is it a product which can be easily subjected to the efficiencies of production and distribution via the 'silver bullet' of technology. And a 'one size fits all' approach is an Industrial Age anachronism when the real power of online technologies is to provide more, not less choice. Those of us engaged in developing online materials must ensure that we do not demean the quality of a university education. We must 'use' the tide, like Canute, for a greater good: in this case, to harness the teaching and learning power of computers to *improve* the quality of education.

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