Pedagogy First: Developing Collaborative E-learning Environments

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Introduction

Universities were first established over a 1000 years ago and quickly assumed the role of developer, producer, transmitter and gatekeeper of higher order scientific and humanistic knowledge (Clark, 1998). Once the bastions of a traditional knowledge base, catering for a small number of elite school-leavers, they now cater for large numbers of students of all ages with increasingly diversified needs, interests and abilities (Guiton, 1999). A new knowledge economy and an expanding and changing labour market is demanding that universities provide appropriate education and training to suit the ever changing needs of society (Salmii, 2000).

The growth and change in economics and political and social transformation across the world has created opportunities to break the dominance of traditional norms, by masses claiming privileges previously reserved for the elite. Education is one of these privileges. An expansion in the provision of primary and secondary education and increased needs for a better-educated workforce, has produced a demand for more further and higher education places. According to Morrison, this demand has led to a 'massification of higher education' (1995, p.189). Coupled with the rapid changes in the workplace, re-training or ‘upskilling’ has become essential. In this setting, higher education has changed from a model solely based on a culmination of study leading to a degree, to increasingly an organisation that provides life-long learning opportunities (Guiton, 1999). The demand for more higher education places is linked to society needs to educate more people for less public money. Higher demand, coupled with lower public funding and fee-paying students, changes the relationships between institutions and students. Institutions are becoming ‘sellers’ of education and students the ‘buyers’. One result of this move towards a more market-driven higher education economy has led to institutions needing to become more student-centred (Cunningham & others, 2000).

In the last few decades, universities have undergone significant transformation and change. This has resulted in the emergence of new kinds of institutions, changes in patterns of governance and finance, the establishment of accreditation and evaluation mechanisms, curriculum reforms, and technological innovations (Salmi,
2000, p.7). For example, a UK report on higher education states:

UK higher education can take justifiable pride in what it has achieved over the last 30 years. It has expanded opportunities, changed and adapted as the needs of students and other clients have changed, maintained its international standing in research, introduced new approaches to learning and teaching and to quality assurance, and greatly improved its cost effectiveness (Dearing, 1997, para. 3.2).

Taylor (1999) points out that universities have always evolved and adapted to meet various demands and it is reasonable to speculate that university longevity, in part, has been achieved through this capacity for change. What particularly has changed, Taylor argues, is the speed in which change is now occurring (1999).

Barnett (2000) describes the changes within universities in an age of 'supercomplexity' as follows:

A new world order is upon us. Partly as a result of globalisation, partly as a result of the information technology revolution and partly as a result of other forms of change, we have to reckon with societal and global dislocations that challenge the progress towards modernity (p.3) ... the university is in some difficulty in all this, to put it mildly. Firstly, it sees itself as having something to do with knowledge. Secondly, it likes to believe that it is in the vanguard of progress. Clearly, in this new world order, both of these self-beliefs are problematic. Thirdly, ... the disturbance of our framework in the modern world is not just intellectual in character but also challenges our sense of ourselves and our sense of right action (Barnett, 2000, p.77).

There is a changed and increased role for universities to help meet the new challenges in society and the economy. However, the increase in demand to meet these challenges has come with no increase in funding. The growth of new knowledge, of new techniques requiring ever increasing specialties, stretches the range and scope of the disciplines and the staff that teach in them. Universities are pressured to change their curriculum, their discipline-based structures, to modernise their increasingly expensive physical facilities, to go out and find alternative sources of funding, and in general to do much more with much less (Fox & Radloff, 1999).

The use of ICT and the potential of e-learning is seen by many in higher education as providing an opportunity to overcome the crisis of increased demand, reduced resources and the need for a more client-centred approach (Farrell, 1999; Harry, 1999). It is believed that ICTs, coupled with distance learning and self-
directed strategies will enable institutions to expand their student base beyond the campus walls and beyond national boundaries (Daniel, 1996). Speaking as the Vice Chancellor of the Open University UK, Daniel (1996) argued that the ‘mega-universities’ - those which have the most numbers of student places - offer the most economic service. In 1998, the Open University in the United Kingdom enrolled 25,000 international students living in ninety-four different countries. Gafford (1995), quoted in Daniel (1996), notes that in the United States, fourteen million students were enrolled in 3,500 higher education institutions with an average cost of $12,500 per student, compared to 2.8 million students in the eleven mega-universities costing approximately $350 per student.

In line with increased globalisation, higher education institutions are not only crossing international borders, but are entering partnerships with the corporate sector and individual entrepreneurs in order to make up the shortfall needed to provide levels of education service to the increased number of students (Cunningham & others, 2000).

At the same time, Farrell (1999) points out that ICTs have been the catalyst for an ‘unbundling’ of functions related to the educational process, making possible new types of organisations, which specialize in different components of the educational process. For example, Queensland Open Learning Network, the Western Australian Telecentres and the European Study Centres are designed exclusively to provide support for learners and institutions. The Oxford, Stanford and Yale universities alliance AllLearn (http://www.alllearn.org/Oxford1/) offers ‘boutiqued’ continuing and general interest E-courses backed by outsourced support (Wyatt, 2002). In the United States, organisations such as McGraw-Hill Learning Infrastructure provide consultancy advice, project team managers and technical support to institutions. The ‘unbundling’ of functions has created another potential effect, that of reducing university autonomy. Universities are no longer the sole providers of all things associated with higher education. In this sense, universities have lost their way and are searching for new solutions (Vest, 1995).

**Technology solutions**

The pressures within and outside universities to digitise, to computerise, to go online and to join the new e-learning revolution continue to increase. Many universities have reviewed their information technology (IT) plans, IT infrastructure and IT support. Often based on external consultancy advice, millions of dollars are set aside to provide universities with the essential new ‘techno-environment’ that is considered so vital in the new millennium. Centralised service units to support teaching and learning are regularly re-structured, amalgamated, rationalised, (de)
centralised or partially outsourced to provide the local support demanded by teaching schools.

Within the university, teaching staff have been encouraged to use e-learning strategies as an alternative or as a supplement to face-to-face teaching. Some universities proudly count the number of e-learning courses they have available and the number of students who have Web accounts (Fox, 2000). In some universities, academic promotion and tenure itself is linked to evidence of 'high-tech' application in teaching and learning (Noble, 1998). Implicit in the moves towards breaking the grip of traditional face-to-face teaching is the presumption that the use of new technology equates to improved teaching and learning (Burbules & Callister, 1999). To support this perception, there is an ever-increasing number of papers and reports. Most are framed by a determinist paradigm which positions (new) technology as the benefactor and the agent of change. These papers and reports are predominantly descriptive: they herald the benefits of the changes and the transformation technology has brought to bear on the quality of teaching and learning. At the same time there is a growth of papers describing sobering, complex and contradictory tales of the use of new technology in higher education (for example, Taylor & others, 1996; Oppenheimer, 1997; Robertson, 1998; Noble, 1998; Kling, 1999; Herrmann, Fox & Boyd, 2000; Cuban, 2001; Werry, 2001; Warschauer, 2002).

The appeal of new technology

Noble (1998) points to relatively huge university investment in IT, with no clear or convincing case to show that digital pedagogy is superior to traditional forms of teaching and learning. If, for example, peer teaching was proven to be a better more effective form of pedagogy across many disciplines, would the kind of investment that is going into IT go into supporting peer teaching? Quite clearly, there is considerable appeal to invest in new technologies, whether in higher education or in society more generally. Of course, an obvious problem with investing in more conventional forms of education is that funding goes into an uncertain process, with little real control of learning outcomes. In general, and at one level, it is hard to commodify face-to-face teaching and the learning process. But within an e-learning environment, we can count the number of students who are engaged in e-learning courses; we can, more centrally, monitor course content and processes; we can develop standards in e-learning environments and require adherence, and we can audit interactions between teachers and students. But what does this mean? Does it mean we have become a more efficient and effective organisation? Does it mean we now teach better than before and that our students are learning more in less time?
Theoretical Underpinnings

Technology as practice

According to Pacey (1983, p.6), technology-practice is the 'application of scientific and other knowledge to practical tasks by ordered systems that involve people and organisations, living things and machines'. Franklin (1990, p.12) takes up Pacey's notion of technology as practice which 'shows us the deep cultural link of technology' to the organisation of work and of people. Franklin (1990) sees 'technology' including ideas and practices, ways of thinking and ways of doing things in addition to the tools that are used to do the work itself.

'Technology' thus becomes intimately concerned with social values and, as it becomes seen as medium rather than tool, it takes on some of the characteristics of a language. Thus Medway (1993, p.7) talks of language as a 'technology of thinking'. Ihde extends this notion describing technology as 'texture' and as 'background' to the way we read the world. Ihde (1990) states that we live in a 'technological cocoon', where technology is transformative in its social and cultural effects and consequences, and where we come to know the world through technology.

Bigum (1997a) described, then analysed, how new technologies impact on and change teacher's work practices. Fox and Herrmann (1997, 2000) analysed various applications of technology in higher education settings and stated that the changed roles and work practices these technologies bring to teachers, students and support staff are very significant. Dawson, Taylor, Geelan and others (1999) with reference to feminist research and, in particular, the work of Belenky, Clinchy, Goldberger and others (1986) and Clinchy (1996), describe research which focuses on the Web-based component of a course. The tutors on the Web-based course explicitly valued and nurtured the 'connected knower' skills of empathy, learning from personal experience and a sensitive collaborative approach, attempting to move their students towards an epistemological pluralism of constructed knowing, an integration of separate and connected ways of knowing within the Web-based course. This research highlights some of the changed roles and practices offered by online learning environments.

Hodas (1996) argues that institutions are themselves technologies. They have certain cultural practices and particular purposes which all impact on and often dominate any technological adoption. Hodas continues:

The norms and procedures of entrenched bureaucratic organisations are strong and self-reinforcing. They attract people of like minds and repel or expel those who don’t share them. Schools are technologies, machines with a purpose. They embed the norms and processes in their outputs, which in the case of schools helps them to
further strengthen their cultural position and resist marginalization (p.217).

**Non-neutrality of technology**

Idhe (1982) and Bowers (1988) have emphasised the importance of recognising the 'non-neutrality' of technology. This position has been taken up by a number of scholars who argue that technology is not, and cannot be, neutral or value-free. They see that the ever increasing inclusion of (electronic) technology into the curriculum will impact and change the curriculum and will inevitably lead to a shift which now includes the technology as an entity in its own right in the curriculum (Green, 1993, p.148).

**First and Second level effects**

Sproull and Kiesler (1991) developed a two 'level' perspective on the introduction of communication technologies to organisations, which can readily be applied to educational settings. Although their work is based on ten year old research, their two level model is frequently cited as a base for more recent research (see for example, Lankshear & Snyder with Green, 2000). Sproull and Kiesler's 'first level' refers to the expected benefits from implementing new technologies. These benefits would include planned technical efficiency gains, measured by value-added analysis. For example, the ability to reduce certain costs by transferring print materials to the web; the inclusion of hypertext links to world wide resources; (multiple)media limitations of paper-based materials; and auditing mechanisms that can provide the all important performance indicator measurements with quick and easy sets of figures, ready-analysed.

The 'second level' effects relate to context in the sense of changes in the environments of practice and in the practices themselves. According to Sproull and Kiesler, 'second level' effects come about because:

... new communication technology leads people to pay attention to different things, have contact with different people and depend on one another differently. Change in attention means change in how people spend their time and in what they think is important. Change in social contact patterns means change in who people know and how they feel about them. Change in interdependence means change in what people do and for each other and how these coupled functions are organized into norms, roles, procedures, jobs and departments. Social roles, which codify patterns of attention and social interaction, change (Sproull & Kiesler, 1991, pp.4-5).

In most educational settings, new technologies are adopted on the basis of their first level effects - the benefits that accrue from their use as a resource. The
productivity gains - for example, increased efficiency in the dissemination of information online - is seen as increasing communication efficiency by using email, etc.

The 'second level' effects of new technologies are harder to understand and harder to anticipate, if not impossible to predict (Bigum & Green, 1995, p.14). Contextual changes using the new technology and the resultant changes in work practices provide for changes in the way the technology is used as a resource.

In this sense, using ICTs creates new ways of thinking:

new ways of working, changes in attention, interdependence and changes in social contact patterns ... all of which contribute to a changed and changing context, which in turn, support new practices, further changing the context, and so on (Bigum & Green, 1995, pp.14-15).

It is important to note the implication of this ever evolving and changing state: that predictive claims given to support the implementation of a technology are difficult if not impossible to substantiate. However, as Cuban (1986, p.14) points out, the novelty of new technology along with the powerful rhetoric surrounding it may well guide 'researchers, policy makers, and informed practitioners' to believe that the new technology demonstrates 'its superiority as a teaching tool'. As Bigum and Green argue:

This means that what becomes crucial in determining what happens in ... (universities) ... is not so much driven by what is known, as by rhetorics which draw upon a context that has arisen from past practices of and attitudes towards other technologies (1995, p.15, my emphasis).

The positives associated with ICTs therefore must be taken into account along with their potential negatives. In considering technology in teaching and learning, therefore, it is important to position the various complex issues and current work practices within education along with an understanding of social-cultural imperatives. Iacono and Kling (1996) argue that promoting computerisation in education is better understood as a kind of social movement:

a rhetorical form which we call technological utopianism ... [This] is a key framing device for portraying societal renewal through technology and allowing people, many of whom know little about computing, to identify with the goals of the movement (Iacono & Kling, 1996, p.101).
However, countering the promotion of technological utopianism are discourses of anti-utopianism which, like utopian discourses, ‘paint with monochromatic brushes: white or black’ (Kling, 1996b, p.51) on a complex issue. In a different critical review of technology practices, Tenner (1996) developed a simple rule of thumb that the more sophisticated the technology, then more complex the issues become.

**Media shifts and new university cultures**

The notion of the media shift as an alternative perspective for looking at IT and educational change reflects an examination of complex and heterogeneous changed practices and pressures, as Luke describes:

> the acts and artifacts used to reproduce collective understandings among specific social groups are changing profoundly: print discourses, face-to-face classes, paper documents are being displaced by digital discourses, on-line classes, electronic documents. The former will not entirely disappear, but so too can they not be counted upon to reign hegemonic (Luke, 1998, p.2).

Luke describes collective understandings that reinforce entrenched ways of operating within universities: universities have a physical environment, halls, lecture theatres, a presence that reinforces certain routinised pedagogical practices, for example, face-to-face classes, the lecture, the tutorial and the seminar. In this environment, print technologies have influenced and organised subjects and disciplines and have produced a culture of ‘book’ based education (Green, 1997a). The book has been the central medium of knowledge production and contains and constrains pedagogy in various ways, standing between the learner and the ‘real world.’ Books are bound, having a certain physical shape, printed text on paper, pages with edges, borders, margins, encouraging a particular form of interaction and rationality (Tuman, 1992; Schr iver, 1997; Green, 1997b). The learner’s experiences of the educational world out there has been dominated by reading printed text. Books encapsulate meanings, and the task of the learner is to extract this meaning. The role of the teacher, as a presumed authority in the classroom, stands in for the author and for the (experiential) world (Idhe, 1982). Students complete assignments and exams in print, while the university degree itself is based on assessing students’ writing. Luke argues that these conventional practices, ‘tied to mechanism, print and corporal embodiment’, is now challenged by a newer and wired electronic, coded and hypertextual telepresence’ (1998, p.2) where the digital environment is a new technology - requiring a new social imperative and form of life (Bolter, 1991, 1995; Bigum, 1997a).

Green (1997c) has argued that we are seeing a profound shift from, and a decisive movement of a very complex kind: a transition between the Age of Print and the Age
of Digital-Electronics. He argues that we are in the midst of a shift from print to digital-electronics - 'from the print apparatus as the organising context and resource for educational and social practice to the digital-electronic apparatus' (Green, 1997c, p.2). This shift in the 'apparatus of culture is changing ... not only in technology but in institutional practices and the ideology of the subject as well' (Ulmer, 1989, p.xii).

Elson-Green in an interview, quotes an argument forwarded by Spender (1995) that digital technology and especially online technology is changing cultures in education and placing new pressures on learning outside the control of teachers. She adds that twenty-first century education will centre on the business of learning, and questions what role universities and teachers will play in the future: 'unless academics acquire the mind set and the competencies to be leaders in the learning business, the prospects could be all gloom and doom'. Spender suggests a likely scenario in the future for academics is as 'learning managers' that aim not to be the best in the world but who know how and where to go in the world to access the best through online technologies (Elson-Green, 1999).

A glimpse to future possibilities for online learning in higher education can be explored, Luke (1998) suggests, by examining the consortium of seventeen western states, the Western Governors Association creation of a 'virtual university.' In February, 1996 the Western Governors University (WGU) was formed to offer degree programs to 'enhance the marketplace for demonstrated competence through certification that is widely accepted by employers and traditional institutions of higher learning' (Western Governors Association, 1997). The WGU was established as a broker of knowledge between outsourced content providers and individual learners. WGU courses are accompanied by 'an explicit statement of the competencies that should be achieved upon completion, as well as an indication of the assessment methods that will be employed to certify these competencies' (Western Governors Association, 1997). The WGU offices are small and relatively inexpensive to run, providing administrative support, which sets quality control standards, develops rules and policies, and organises 'franchises' of instructional inputs:

By undercutting the average annual student costs of US$9,000 at a typical state university, the WGU aims to serve non-traditional older students, traditional college students needing extra courses, employees seeking various sorts of training, and lifelong learners in the personal enrichment market. Competency-assessment, and not degrees, is to be the main measure of student success, but the WGU now offers a multi-track Associate of Arts degree (Luke, 1998, p.8).

WGU uses 'technologically-delivered educational programming' to offer degree and non-degree programs awarding competency-based courses which are
competitive, cost-effective, flexible, client-centred and market-oriented, in a non-traditional university form (Western Governors University, 1997). WGU breaks ‘down the barriers of regulations, bureaucracies, tradition and turf’ (Western Governors University), which, as Luke points out, is the main innovation of WGU: not WGU’s use of online technologies but the institutional changes embedded ‘behind its operations and structures’ (Luke, 1998, p.9). As Governor Leavitt points out, WGU operates as:

a kind of New York Stock Exchange of technology-delivered courses.’ He envisions a catalogue with listings from hundreds of institutions, corporations, and publishers, giving students ready access to thousands of educational opportunities’ (Blumenstyk, 1998).

Online technology makes the operation and structure of WGU possible, providing a very different model of higher education to the traditional universities, which Utah Governor Michael Leavitt, a founding member of WGU, describes as bastions of a ‘feudal system’ designed to award outmoded guild privileges (Blumenstyk, 1998). One outcome predicted is a financial shift from state university systems:

to systems of individual choice, giving students vouchers to spend where the marketplace and competency regime show the best education can be had. ... The real innovation of the WGU is this new symbolic economy of academic achievement, moral economy of personal choice, and public economy of lower costs (Luke, 1998, p.10).

The use of new digital-electronic technologies are seen as bringing education to the students rather than forcing students to subsidize so-called, ‘fancy’ campuses and ‘feather bedding’ faculties (Gubernick & Ebeling, 1997, p.3). This image of higher education has gained a degree of favour in Australia, as exemplified in the recommendations of the West Report (1998).

**Technology online**

K.C. Green (2001) and Geoghegan (1996) identify online technology and e-learning as a major area of growth in technology application in higher education over the last five years, and note that this trend is likely to continue. DeLong (1997) argues that the growth of Web in education fundamentally challenges and ultimately changes the way students are taught and the way students learn.

The Web challenges the authority of the professor in the classroom by democratizing information. It shifts the focus from production and delivery to customer and content - from professor and lecture to student and information. The most skillful instructor is therefore the one who can best teach discernment among
myriad competing sources of information. The culture of higher education is likely to be profoundly changed as a result (DeLong, 1997, p.1).

Burbules and Callister (1999, p.797) state that the challenge for education is:

helping students learn to operate in an environment that is inherently dangerous, to deal with what may be unexpected or unpleasant, to make critical judgements about what they find. Such a task cannot be framed as simply sorting out the 'good' from the 'bad', and excluding all that is 'bad'. **Educationally, we need some of the 'bad' in order to create some of the 'good'.** How else does someone develop the skills and dispositions of critical discernment?

In response to concern regarding the complexities and relative (de)merits of introducing new technologies into mainstream teaching and learning, the University of Illinois set up a 'year-long faculty seminar ... [which] sought to identify what made teaching to be good teaching, whether in the classroom or online' (University of Illinois, 1999, p.1). The seminar concluded that 'online teaching and learning can be done with high quality if new approaches are employed which compensate for the limitations of technology, and if the professors make the effort to create, and maintain the human touch of attentiveness to their students' (p.1). The report includes practical considerations for teachers and administrators concerned with the expansion of online course offerings.

Bringing together a broad range of ideas from the educational literature and research on technology and technological practice in higher education helps to identify a range of complex, interrelated and competing factors likely to impact on the professional practices of staff as new technologies are adopted within educational settings. It also helps to conceptualise a generic framework through which to view various kinds of technology practices, which are triggered by the introduction of new technologies.

**Change**

All staff at universities are facing ongoing changes to their roles and responsibilities and acceptance of these changes is varied (Taylor, 1999). Kellner (1998, p.75) describes the 'loss of certainty ... anxiety and loss of direction' felt by many academic staff. Along with uncertainties is a demand for action. Management is keen to be seen to be effecting change, identifying change as a sign of strong leadership and making change itself an indicator of improvement. Central administration, management and central academic service units can see themselves as **agents of change** and use the occurrence of change as an indicator of success (Taylor, 1999).
The adoption of new technologies brings with it considerable change, though often in different ways to those originally conceived. As Brown and Duguid (1996) point out: 'it’s ... less helpful ... to say simply that higher education will change because of changing technologies than to say the emerging computational infrastructure will be crucially important in shaping an already changing system' (p.11). Those who saw the new technologies as providing efficiencies in the existing teaching and learning practices are finding that much of the current practices are problematised by new technology adoption. Work patterns and work roles change and the ways of doing things change. Different technologies privilege certain practices and exclude other practices (Idhe, 1982). The divide between work and home changes, sometimes blurring previous distinctions. The end result is not the same environment plus the new technologies, but that things change to accommodate the new technologies (Arnold, 1999). Within work environments in higher education, the introduction of new technologies was primarily to facilitate teaching and learning and improve management and administration. But the manner in which new technologies problematises aspects of the how and why of teaching and learning has effected greater (and different) kinds of change (Arnold, 1999).

There is a growing body of literature on the impact of technology and changing university roles. An overview of key texts include the following: Hargreaves (1994) and Martin (1999) explore the competing tensions in contemporary academic life and argue for the need for staff to adapt to changes confronting higher education; Steele (1995) proposes that the increasing use of the Internet in teaching brings a shift from teacher to learner-centred models of e-learning; Nunan (1996) argues that the changes occurring change the balance of power between teacher and learner; Fullan (1993) argues that change is too important to leave to the experts and that all stakeholders must see themselves as ‘change agents’; DeLong (1997) argues that there is a major change in the teachers’ role and an increased power for the student; Tinkler, Lepani and Mitchell (1996) suggest removing barriers between academics and general staff and the emergence of a new group of ‘co-professionals’, leading to a future emergence of the ‘higher education worker’ replacing the present academic/non-academic divide; Bigum and Green (1995) and Bigum (1997b) see the redefining of teachers’ work, blurring roles and distinctions between teachers, support staff and administrators; the Hoare report on higher education management (1996) stressed the need to shift from academic teaching in transmission of knowledge towards an involvement in market research, curriculum redesign and evaluation; Fowell and Levy (1995) envisage an increased role for academic service staff, the ‘para-pedagogues’ (Green, B. 1994, pers. comm. 19 November). Fowell and Levy (1995) see the need for these para-teaching staff groups to acquire more generic knowledge and skills in educational development, instructional design, librarianship, information technology, performing troubleshooting tasks, using online resources, etc.; Dolence
and Norris (1995) believe that universities must move from an emphasis from teaching to learning with the 'network' rather than the campus as the fundamental organisational unit and the need for staff to 're-engineer' their roles. Clark (1998) urges universities to provide more strategic, co-ordinated efforts to become more innovative and entrepreneurial; Taylor (1999) examines changes for academics and offers strategies to assist staff to adapt to the changing university environment; and Evans and Nation (2000) stress the importance of educators being aware of and critically engaged in debates concerning technology itself as well as the use of these new technologies.

**Changing staff roles**

Within the changing university environment, roles and responsibilities of staff are changing. The increased pressure on academic staff to do more with less resources in an increasingly sophisticated higher education environment has also impacted on the work practices of the 'para-pedagogues' - the instructional designers, professional developers and technicians. The nature of the work of these para-pedagogues continues to revolve around working closely with academic staff (re)designing and (re)developing teaching and learning materials and environments and in using new technologies particularly for e-learning. The work of the para-pedagogues has changed, in part, due to the new practices required in working with the new technologies.

McNeil (1990) sees any adoption of technology in higher education has three primary obstacles: attitude, technical and structural. He sees attitudinal issues 'are far more important than structural and technological obstacles in influencing the use of technology in higher education' (p.2). The relationship of staff attitudes and beliefs to change is therefore crucial to this study. Beliefs are seen as fundamental to practices:

The last few years have witnessed a realisation that research on teacher thinking will not provide us with adequate understandings of teacher behaviours, and that the study of beliefs might provide a more promising approach to understand teacher behaviours (Hashweh, 1996, p.47).

Within this context, the importance of designing an e-learning environment, based on user needs, values, attitudes and experiences of new technologies was therefore considered essential to the MSc[ITE] program.

**Objectives of the study**

With reference to the literature above, the objectives of this study are to
investigate changing staff roles and responsibilities brought about by new technology applications; to raise key issues that need to be addressed in institutional moves towards mainstreaming e-learning environments; to discuss the rationale in the development of a ‘democratic’ e-learning environment and to reflect on how this environment is used to meet specific pedagogic goals.

**Design and Procedure**

This study examines the more complex issues, challenges and opportunities that new E-learning technologies provide through exploring staff experiences, beliefs and understandings in higher education institutions. In this study, technology is viewed not simply for what can be done through it: it is viewed as acting ‘to reorder and restructure social relations’ and practices in society and the workplace (Franklin, 1990, p.13). ‘Technology’, then is seen as *privileging* certain ways of doing things and excluding other ways. Central to this study is an investigation of my own workplace, where I am a ‘practitioner-in-the-field’, researching and participating in the study. One challenge I set myself was to step back, so as to be able to examine and analyse the social experiences of my colleagues, in an attempt to identify what impact any change in technological practice was having on their professional lives. In this study, I wanted to come to terms with the meanings and understandings of staff in the context of their workplace, in ‘naturalistic’ settings. Naturalistic inquiry is a form of qualitative research where the researcher enters the natural environment to observe and to understand social experiences of the selected participants. This study uses a naturalistic inquiry framework to examine the question of what it is like to live through a certain experience and attempts to identify what impact the experience has on the life of people.

As a researcher, adopting a naturalistic inquiry method, a number of assumptions were held, namely that:

- as a writer and practitioner, I was an integral part of the research;
- the data collected and analysed was specific to the context in which it occurred;
- emerges from the data and is grounded in the data itself;
- knowledge is not fixed and permanent but, rather, is ‘contested, temporal and emergent’ (Clifford & Marcus, 1986, pp.18-19). Knowledge is socially constructed and is not a known entity waiting to be discovered. Reality is defined through an understanding of my own and others’ points of view, beliefs, interpretations and experiences, where social reality exists as meaningful interaction between individuals’ understanding; and
- data collection and analysis occur simultaneously and help develop and
shape the research.

The reporting and writing up of outcomes of the various research stages was an iterative process, with each level of analysis revealing different issues, each one influencing further research. The outcomes from this research were grounded in the data, rather than from a theoretical hypothesis. Part of this study also examined a particular use of E-learning within the University of Hong Kong’s Faculty of Education masters course.

The Master of Science in IT in Education (MSc(ITE)) is a flexible and innovative course that prides itself on its ability to adapt to the needs of its students and tutors. In the design of the E-learning environment, we were conscious of the word technology and its meaning namely that it derives from ‘teche’ meaning ‘ways of doing’, joined by ‘logike’ meaning ‘reasoning’. Technology then ‘refers to what people do as well as what they know’ (McWilliam, 1996, p.11). We also needed to develop a technology that supported our pedagogic values, beliefs and practices, and were mindful of the following:

Do not think of the new technologies as a solution looking for a problem. Do not use them just because they exist, ‘use them only if they bring added value to what we are doing. Think about them in the context in which they are being used ... bearing in mind any constraints ... Do not overestimate the immediate effects ... (Chaptal, 1998, p.242).

We needed a shared environment with a minimum of fuss and bother that encouraged the use of plenty of A.I.R. (user-participation to be Active, Interactive and Reflective) (Radloff, 1996) towards our goal of critically informed and reflective practitioners in ITE.

The E-learning component of the course needed to allow easy access to leading ITE experts located around the world who participate in the program. Some of these professors never come to Hong Kong, however, the majority do teach on the program face-to-face, but they also need regular access to the E-learning course room year-round, not only to upload and point to resources and activities for students and to communicate with the course team academics and administrators, but to be able to read, reflect and comment on student messages sent to the E-learning course room. At the same time, the designers were keen to ensure that the environment encouraged or at least did not to hinder the trialling of new pedagogic spaces, new opportunities to do things in different ways.

With busy guest academics located in Australia, Belgium, Denmark, Holland,
New Zealand, Switzerland, the UK, the USA and elsewhere, we needed an environment that was both democratic and empowering in its design — offering all involved opportunities to see each other’s work online, to share and exchange ideas and to build on and encourage participation in the various modules and in improving the design of the environment. In fact, many of the modules taught in the program are done so with teams of tutors working together. In various modules, one team member may be located in the USA while the other is in Hong Kong. Good simple communication and interaction was therefore essential. The design team was also keen to promote the three ‘C’s for the course, namely Communication, Cooperation and Collaboration in the course development and in the teaching and learning, the evaluation and iterative changes to the E-learning environment.

The concept of ‘KISS’ — ‘keep it simple stupid’ was important. No HTML knowledge or writing was required, thus offering the maximum teacher-student control with the minimal technical interference within a flexible shell, which takes into account tutor and student past experiences with E-learning environments, notably with WebCT, Lotus Notes, Intranet.com, Centra, IVLE and various lesser known products. The development of the shell adopted an iterative process of trial and error in learning and teaching online with regular feedback sessions from teachers and students. The result of this process was the creation of Interactive Learning Network (ILN). ILN is a community-building environment designed to support virtual education communities of practice where teachers and students work as teams and engage in reflective, collegial patterns of work. It facilitates both cognitive scaffolding as well as social scaffolding, which enables teachers and students to become progressively more involved in the community and to sustain their commitment and interests. This environment is designed to support academic programs that rely heavily on pedagogies that emphasize the emergence and growth of autonomous collaborative learning, rather than teacher-centred delivery of learning materials. This environment is also designed to support continuing professional growth and development of professional communities engaged in shared goals and/or projects. The Network also allows for interactions across communities. ILN is a user-friendly web application built upon Java technologies. Linked with a backend database server through Java Database Connectivity (JDBC), the system is extendible and scalable, capable of handling a large number of concurrent processes. ILN by its Java nature is a portable community-building suite and can be deployed to various platforms. No software costs are involved in running ILN as it is built on top of freeware like Tomcat and MySQL.

In brief, the following ILN features facilitate the establishment of virtual education communities as well as online support for real, physical communities.
• Each “natural” group forms a community. The platform supports easy customization of the interface to cater for the specific needs of individual communities.
• End-users may subscribe to become “citizens” of multiple communities.
• Announcements can be made to the citizens of a community.
• A moderator/facilitator of a community may construct and define the access rights of file folders so as to structure and support the access and sharing of resource materials with others citizen of the same community.
• A citizen may exchange ideas with other citizens asynchronously or synchronously through the use of discussion forums and chatrooms respectively.
• E-mail and calendar services are available.
• Selected entries in a community calendar can be exposed to citizens of the same community. Citizens can have own personal calendars.
• Electronic quizzes, assignment submissions, and questionnaires (e.g., teaching evaluation) are supported.

ILN is still evolving and additional features that facilitate learning and communication will be implemented in the near future. Special priority is given to integrating this platform with other technologies that may be exploited for educational purposes.

**Findings and Implications for Practice**

Working in an E-learning environment raises a number of broader questions and issues that need to be addressed. Eleven of these are listed below.

**Pressures on academic staff time**

Teaching staff are under increased pressures. One of the many issues facing learners and teachers in higher education is having to learn and teach more in less time. Academic staff are involved in a continual three-way tug-of-war for their time. The three forces relate to the three traditional demands on academic staff-time for research, teaching and supervisory activities, and the fourth, more recent and urgent claim, which requires staff to engage in entrepreneurial activities, in order to attract private money into universities in an effort to diversify the funding base of tertiary institutions. Among the myriad of demands thrown up by these entrepreneurial pursuits are the tendering of proposals and applications for research grants to tight deadlines, all of which take their toll on already limited academic time.

Within institutions, it is important to acknowledge these pressures and to be
prepared to target projects, which are strategically significant across the university, rather than attempting to encourage a blanket use of E-learning technologies across the entire university community. There is also a need carefully to balance marketing desires, which tend to demand everything to be placed on the Web, with a more considered educational focus on needs and a practical focus on what it is possible to do well, given staffing and resource constraints.

Non-rationalisation of teaching modes

The three dominant modes of teaching are the traditional mode of on-campus teaching, the mainly print-based distance education mode, and the more recent E-learning mode. While academic staff are struggling to integrate and rationalise these modes, the current tendency is to use them in an additive fashion, one on top of the other and without any real rationalisation.

Is this approach making the best use of the modes available, and is it economically sustainable? Bates (2000, p.26) suggests that an additive use of technology leads to increased workloads for both teachers and students. This study supports the concern about staff being pressured to work online and that this has predominantly resulted in the technology used in an additive fashion. As one academic told me: the 'majority of our E-learning sites just have PowerPoint presentations, Unit outline and lecture handout documents and that's about it!' A carefully considered balance between the use of online technology as a supplementary resource or one which replaces existing resources for teaching and learning is essential. This balance needs to be assessed across various levels within the university, faculty, school, course and unit team levels, and supported by a well-planned funding and support base.

Different changes

The degree of the importance of E-learning differs across the disciplines. Not every discipline considers E-learning to be central to their programs. Some, however would see E-learning as central not only to the curriculum as an object of study, teaching and delivery, but to the research effort as a whole.

New E-learning technology is changing the nature of some professions and disciplines. For example in engineering and technology, architecture and building and commerce, such technology is a key object of research and an essential part of professional practice. In other disciplines, teachers do not necessarily consider new E-learning technologies to be of central importance to understanding or teaching the subject matter but, rather, as adding a new and important dimension to the discipline, allowing information to be stored and retrieved in new ways.
Thus, different disciplines and cultures have different views about the role of E-learning technologies. Prescribing particular uses of the technology, then, is seen as less helpful than providing examples of how E-learning can be used in varied educational settings. At the same time, Schools should be offered assistance in developing their own teaching and learning plans that take into account the use of these technologies.

**Changing attitudes and changing practices in changing times**

Staff may be slow to take up the offer of new E-learning technologies. They may also be reluctant to change their work practices or move outside their comfort zones. E-learning technologies tend to change ahead of any changes in staff attitudes and abilities in using them. And at this stage, only for a minority do new E-learning technologies provide new and exciting ways to work and teach. For many staff interviewed, the face-to-face mode of teaching is seen as inherently ‘better’ than any form of mediated teaching. Yet there were many instances where the use of new technologies provided new opportunities for students and teachers to work, which were more appropriate than those opportunities provided through face-to-face environments. Based on observations, one effective strategy is to target areas where technology is a critical part of the curriculum, and where projects have committed staff teams to ensure the project’s success. The project outcomes, well documented and disseminated, would provide exemplars of practice, leading others to follow suit.

**Central role of staff development**

Academics, managers and academic service staff interviewed, all acknowledged the critical role that staff development must play in any moves to reform practice. As Bigum (1997a, p.9) points out: ‘teachers’ needs are often neglected because of the widespread perception that students needs are especially urgent; that if students are not properly prepared in the classroom for living in a world with computers then they will be disadvantaged.’ Bigum (1997a, p.9) advances the notion of ‘teachers first’, which encourages teachers to attend to their own training needs in the use of ICTs and E-learning technologies first before those of their students. Beaty (1995) considers staff development as an essential component of any change process, which should be closely aligned to any policy change:

Staff development is an essential requisite of change management. Without it staff cannot be expected to practice in line with the policy’s intention and cannot be blamed for this. . . To put policy into practice demands that staff be made aware of the policy, that they have the opportunity to question and discuss it in order to fully understand and tune it to their practice, and that they develop
the ability to deliver it through a program of staff development (p.34).

University teachers are well qualified in their disciplines but often lack formal qualifications and training in teaching and learning. Sometimes teaching philosophies and curriculum development remain unexamined, leading to a focus on content with less attention to other equally important elements of curriculum development, especially the need for models of practice to promote more student-centred learning. Likewise, the rapidly changing technologies provide teaching staff with new opportunities to assist and change teaching and learning within their subjects. It is not easy to focus on all the issues, and often the focus is on the technology rather than teaching and learning issues. With the growing importance of E-learning, across universities and in line with teaching and learning plans, professional development needs to be targeted in order to assist staff to change their practices.

Staff beliefs may need to be discussed and reviewed with peers, and any professional development must be based on listening to teachers’ experiences in new contexts and environments. Staff need ‘safe’ opportunities to challenge their own beliefs and ensure that time is given to reflect on and develop alternative ways of thinking about and using new technologies. Professional development must keep a focus on teaching and learning issues not centred around E-learning technology itself. Teachers may feel comfortable about becoming part of a professional learning community and see that professional development is grounded in teaching and learning practices (Taylor & others, 1996). At the same time, staff need to be given time to trial and reflect on using E-learning in varied teaching contexts. Teachers need time off normal duties, away from the day-to-day hustle. They need opportunities to collaborate and engage in discussions about teaching and learning with peers. As Holt and Thompson reason:

Rethinking practices, particularly in cross-campus and on-campus teaching settings, requires appropriate periods of critical self-reflection and planned experimentation. Senior management needs to be aware of this and should provide substantial funding to buy in or second out academic time to work on innovative uses of technology, away from the constant demands of work which strongly reinforces status quo practices in the organisation (Holt & Thompson, 1995, p.58).

Reflecting on research findings as well as my own experiences, two key staff development issues arise: a) all projects must be carefully coordinated and integrated into the curriculum, with strategies in place to involve not only the project developers but other academics within the faculty. These staff will need support and training in
using the online resources and environments effectively, c) an ongoing rather than a ‘one-size-fits-all’ staff development program is essential, to ensure that not only the innovators and early adopters but also the mainstream continue to use and adapt the resources and environments to suit their own needs and those of their students. The resources needed to provide such staff development support should also be built into the cost of the IT project.

**Using technology appropriately**

One strategy for identifying ways to use technology appropriately has been to examine the unique ways of working with E-learning technology, those that are not possible with other media. At the same time, print and digitised technologies are recognised as providing complementary educational purposes. Print, for example, is an excellent medium for those needing to learn a lot of sequentially developed material. Online technologies, on the other hand, provide opportunities for searching the text material very flexibly and selectively to solve particular problems. It is possible to go straight to the heart of the information required. The majority of academics (and students) encountered throughout this research maintain that print is still an excellent medium for sitting down and formally learning, in a measured way, a lot of conceptual material.

**Breaking the grip of print**

The printed text continues to play a dominant role in teaching and learning in higher education. Having said this, it became apparent during the study that in universities, which are exploring and expanding the educational uses of E-learning, there is a strong desire to ‘break the grip of print’ in favour of digital texts. An argument frequently forwarded was ‘the more we place on the Web, the less we have to print.’ Embedded in this assumption is that we will teach in exactly the same way as before, only now the paper-based materials will be in digital format. However, the whole basis of this study highlights that changes in technologies used result in changed practices.

According to research collated by Schriver (1997), we read between twenty to forty per cent less accurately off screen than we do off paper, and moreover we also tend to read differently off screen than off the printed page. This research is supported by a study conducted by Karen Murphy at Ohio State University, and reported by Penny Stern (2000). Murphy’s research, concluded that the 131 students participating in the research found text on paper ‘to be much more understandable than respondents who read the texts in computerised form’. And further, that the students ‘found the computerised text significantly more difficult to understand, less
interesting, and less persuasive’, even though the text-on-screen had been designed for ‘screen reading’.

The students observed often read to the first HTML hot-link, then branched off to the linked page even before they had finished the sentence. Recent studies (e.g. Nielsen 1999; Lander, 1999) indicate that an effective Web page is concise, scannable and objective. Rohonyia’s (1999) survey, carried out in the form of consecutive writing assignments and oral interviews among students at the University of Veszprem, points to very much the same result: learners on the Web ‘scan’ rather than ‘read’. Rohonyia concludes:

External links always enhance the credibility of a site. Good sites use less words, shorter sentences and shorter paragraphs than traditional printed text. A new basic unit of text is the page, or, rather, the screen, which means half the size of the printed page, or even less.

Upon finding a page when browsing, first off, all highlighted keywords are read, and then comes the jump through hyperspace (cyberspace in our case), sometimes systematically, but in most cases rather at random, following the first glances at the page. Titles and subtitles, font size, bold text, italics, bulleted lists, captions, topic sentences, tables of contents and graphics play a major role in guiding (controlling?) the reader’s attention. Composition is being replaced by page-design. The new style involves new decisive factors: headers, highlights, navigation and search tools, layout combinations (e. g. frames), icons and other graphic elements (Rohonyia, 1999, p.1).

As Rohonyia observed:

While webwriting is more and more a matter of editing rather than classical writing, reading is becoming the study of the information architecture. Reading on the Web is highly associative, and hence, in certain cases, not only interactive but even creative.

McLuhan’s prophecy on the end of the linear Gutenberg Galaxy might be coming true with the advent of non-linear reading in hypertext. It seems that just because readers have less time and want to get information fast, because screen-reading is more tiring and considerably slower, and because the new medium may really be driven by the user, a full new language is taking shape right in front of our eyes. At the same time, results of memory tests comprising both recognition and recall leave the old question of whether ‘the (new, user-driven) medium is (in fact) the message’, still open (Rohonyia, 1999, p.1).
As we become more accustomed and acclimatised to reading and working in E-learning environments, our abilities to read screened text is also likely to improve. In observing and talking to students working online, it was clear that a growing number were comfortable reading large amounts of text on screen. In fact several students stated they preferred to read on screen than off paper.

Another assumption is that the digital media is cheaper than print. But this argument does not take into account, amongst other factors, learning styles and student and staff preferences. For example: a) people may prefer to read texts written specifically for paper or for screen off the appropriate medium rather than vice versa. In other words texts written for the screen are best read from the screen. ‘Paper’ texts should remain on paper and not be transferred to the screen as is. Readers of paper texts on screen often require a printed copy; b) the costs of printing from the screen to paper are then borne by the student (Fox, 1998); c) despite this exponential growth in the use of E-learning environments, many distance education university units have an increase in print runs.

Universities need to think laterally and creatively in seeking alternative solutions to this issue. Some strategies include:

- Rethinking reader resources, based on existing electronic texts. An increasing number of journal and academic texts are providing electronic versions of articles and chapters readily available online
- Reviewing course curricula and considering restructuring the course to encourage the use of E-learning resources and facilities
- Encouraging faculty to adopt new E-learning technologies by providing strategically targeted funding for large scale ‘top down’ E-learning projects and small scale ‘bottom up’ projects
- Providing incentives and rewards for documented educational improvements, rather than for ‘clever’ uses of the E-learning technology.
- Nurturing and rewarding teaching staff who are successful in improving teaching and learning through E-learning developments.

Copyright

Copyright has been one of the major constraints to providing study materials and resources in digital formats for students. A report (Holt & Thompson, 1997), noted that copyright permission is not often given for making electronic copies of copyright-held texts. Ongoing legal battles and the limitations of international copyright acts limit the use of digital environments as the sole form of study materials mediation. However, there is a growing number of readings which are now
available as electronic references - for example online journals and scholarly databases, administered through the libraries. University libraries are playing an increasingly important role in providing full text resources online. However, this expected increase in access to online readings and resources is likely to remain problematic. As mentioned in an earlier section of this chapter - Breaking the grip of print - students will be expected, increasingly, to access readings off the Web and are likely to want to print texts of any length (Stern, 2000) to read. The increased ease of access to online texts materials may also result in further ‘warehousing’ of course materials and resources online, leading to ongoing problems concerning ‘overstuffing the curriculum’ (Fox & Radloff, 1999).

Changing nature of work practices and innovation

As technologies are converging and staff roles are converging, the distinctive roles staff once had have become increasingly blurred (Fox & Herrmann, 2000). This blurring of roles creates tensions amongst staff who may feel insecure and concerned that their professional expertise is no longer needed or that major shifts in their work practices are required. This seems to be the case for academic teaching staff and academic service staff alike. Indeed, there was an increased blurring of roles between teachers and educational developers who had taken on teaching roles. During the research, it was noticed that there were considerable pressures for various individuals and groups to change their work practices and in many cases, despite threats of industrial action to prevent this change, staff have ultimately began the process.

Clear, co-ordinated development and mainstreaming

At the macro level, across universities, there is constant pressure to adopt new E-learning technologies for all kinds of reasons. However, policies and procedures for meeting these were not in place, so limiting the level of successful implementation of many projects using the new technologies.

It became clear that statements of policy and the development of a framework and procedures both need to be articulated, so that staff can effectively implement and incorporate planned changes into their teaching.

Student access and costs

Fundamental to the decision to provide print or digital texts is the question of access. Despite an enormous increase in student access in the last few years to online facilities, there remains a significant proportion of students with limited
access. If only networked electronic resources are provided, some/many students, particularly off campus students may suffer. The universities, therefore, need to decide whether students are required to own or have access to online facilities for particular courses. If no firm commitment is made, teaching modes in courses will multiply.

Geographically isolated students, in general, are seen to have less regular and less appropriate levels of access to online sites. Though remote students may have their own computers, quite often, these are older generation machines and modems too tend to be older and slower. Some students indicated they only had Internet access at work, which can cause conflicts of interest with their employer. In addition, while women indicate that they have access to a computer at home, it is often difficult for them to get the chance to use the computer because of the demands of partners and children. At the same time, there is increasing pressure to require students to have access to online resources.

**Final comments**

‘Success’ in the use of E-learning technology in this study depended on coordinated, well-integrated and clearly considered projects supported by documents, policies and guidelines, which were well disseminated to avoid lost opportunity and wasted energy. In particular, a number of issues emerged as important. First and foremost, is the need for a clearly articulated plan for teaching and learning at university and school levels. The plans provide overall directions and a focus on teaching and learning issues, rather than an exploration of the potential of E-learning technology. Working from the plans supports a dominant role of teaching and learning issues and indicates the need to develop a rationale to incorporate new technologies into teaching and learning. The school-based plan may also help focus discussion beyond what to teach and, therefore, consider how to teach, as well as avoiding the potential wastage caused from adopting a ‘scatter gun approach’ to developing and implementing new technologies into the curriculum. Schools also need to decide on a considered balance between new technologies used to supplement or to replace existing teaching and learning activities.

Further, the growth in the use of E-learning need to be matched by central, planned development in the institution’s IT infrastructure and support, which, in turn, needs to be appropriately resourced and maintained. A planned approach to implementing online learning must also be matched by appropriate financial, technical, administrative and instructional design support. Central support staff, if required to take part in one project, may need to have a reduced role with regard to other responsibilities and, if necessary, those roles may have to be dropped during the
life of the project. The implications for ongoing everyday core business, therefore, need to be carefully considered.

It is important to recognise that the impact of new technology adoption on the curriculum, disciplines, cultures and staff work practices will continue to grow. New E-learning technologies can skew the university’s direction, with multiple demands for change to accommodate new technology developments. Staff need to be able to assess and evaluate various technological practices and technology resources in a spirit of informed scepticism (Durrant & Green, 2000) but not emotional cynicism, to enable them to use the technology appropriately. Teachers, ultimately, must take on a more dominant role in decisions about the use of technology. They must be, as Bigum suggests:

... involved in taking informed decisions instead of simply complying with the dictates inscribed in hardware and software ... [H]ow teachers understand the relationship they form with new technologies and with their students will be pivotal in determining the work they delegate to E-learning technologies (Bigum, 1997b, pp.256).

Deciding what new E-learning technologies should do rather than (Bigum, 1997b, p.258) 'relying on what they can do is critical professional work that goes beyond neutral tools and inevitable technology'.

References


Dearing Report (1997). The national committee of enquiry into higher education The national committee of enquiry into higher education, UK. Retrieved on 6
September, 2002 from http://www.leeds.ac.uk/educol/ncihe/
September, 2002 from http://www.firstmonday.dk/issues/issue2_5/delong
Planning.
Durrant, C. & Green, B. (2000). ‘Literacy and the new technologies in school
education: Meeting the L (IT) eracy challenge?’. Australian Journal of Language
and Literacy, vol. 23, no. 2 June, pp.89-108.
3-9, vol. 5.
Farrell, G. M. (1999). The Development of Virtual Education: a Global Perspective,
The Commonwealth of Learning, Vancouver, Canada. Retrieved on 6 September,
2002 from www.col.org /virtuala
51, no. 3, pp.271-280.
distance education?’, in T. Evans, V. Jakupec & D. Thompson (eds.), Research
in Distance Education 4. Geelong: Deakin University Press, pp.34-44.
Fox, R. (1998). ‘What are the shortcomings inherent in the non-problematic perception
of new technologies?’, in B. Black & N. Stanley (eds.), 7th Annual Teaching
Learning Forum February, The University of Western Australia, Perth, WA,
pp.96-101.
adopting new educational technologies’, in T. Evans & D. Nation (eds.), Changing
University Teaching: Reflections on Creating Educational Technologies.
London: Kogan Page, pp.73-84.
Fox, R. (2000). ‘Online technologies changing university practices’ in A. Herrmann
Fox, R. & Radloff, A. (1999). ‘Unstuffing the curriculum to make room for lifelong
learning skills’, in E. Dunne (ed.) The Learning Society: International Perspectives
on Core Skills in Higher Education. London: Kogan Page, pp.130-139.
Lecture Series, CBC Enterprises.
Falmer Press.
Green, B. (1997a). Literacy, Information and the Learning Society, Keynote address at the Joint Conference of the Australian Association for the Teaching of English, the Australian Literacy Educators’ Association and the Australian School Library Association, Darwin, Darwin High School, Northern Territory, Australia, 8-11 July.  
Green, B. (1997c). Interfaces: English and Technology, Keynote address at the State Annual Conference of English Teachers Association of Queensland, ETAQ, Brisbane, Queensland, 23 August.  
University of Alabama Press.


Policy (Final Report), Department of Employment, Education, Training and
Youth Affairs, Canberra, ACT. Retrieved on 15 April, 2001 from
http://wwwd2.leeds.ac.uk/niche
Western Governors Association (1997). ‘Smart States: Virtual University’, *WGA
Monthly*, vol 2, pp.3-6.
Wyatt, C. (2002, September 11). Oxford University and AllLearn offer Online Courses
for alumni http://www.AllLearn.org/Oxford1 [Msg 1]. Message posted to news
odlinfo@ermine.ox.ac.uk