E-LEARNING AND CHANGE IN HIGHER EDUCATION: THE POLICY ENVIRONMENT

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Abstract. This paper critically examines the role of government policy with respect to e-learning as an agent of change in the higher education sector. The potential impact of e-learning on the structure and organisation of the higher education sector has become a central issue for managers at institutional level and government policy makers across the globe. There is clear evidence from a range of policy documents from various nations of a general acceptance that an imperative exists to engage with the 'knowledge economy' in order to secure or retain a competitive economic advantage in the global order. It is seen that emerging digital technologies have a central role to play in this task and many governments have been active in promoting the development of e-learning as an agent of improvement, capacity building and organisational change in the higher education sector. Evidence is available that such technologies, supported by government policy, have served to enhance the quality of the student experience within the existing organisational and pedagogical frameworks which characterise the majority of higher education institutions. There is, however, little evidence of radical restructuring or the 'transformation' of existing institutions into the 'virtual universities' envisioned by some early commentators. This paper explores the wider policy context within which governments must work if they are to reap the full benefits of emerging technologies.

Keywords: e-learning, higher education, policy, organisational change

Introduction

The leverage of contemporary information and communication technologies makes this (transformation) feasible, and broader global conditions make it necessary. In just a few decades ICTs have enabled dramatic transformations in enterprise of all kinds, and this transformation is far from over. Higher education has resisted such change for several decades, limiting use of the new technologies to traditional back-office applications, but that pattern is changing fast.

Information Technology, Enterprise Transformation, and the Future of US Higher Education

Webcast by Professor John King, School of Information, University of Michigan.

The transition from the 20th to the 21st century has seen a fundamental shift away from a global economy founded on industrial infrastructure to one dominated by the capacity to capture, create, process and apply knowledge. These changes have profound implications for the role and nature of educational institutions at all levels (Hargreaves[1], Martinussen, 2004) and the importance of this shift from a national economic dependence on industrial capital to human capital emerged even before the main surge in the development and application of digital technologies (Becker, 1975).

The growing acceptance of endogenous growth theory as an economic model with its implications for the central role of human resources as a prime lever of economic success has placed education at the top of many government's policy agenda and nowhere is this more pronounced than in the field of higher education.

This acceptance by governments of the primacy of human capital has led many to seek to apply policy to lever the re-engineering of educational institutions and the relationships between universities and the world of business (Peters, 2001).

Clearly, as economic pressure provides a rationale for governments to expand participation in higher education, consideration has to be given to the issue of capacity and the educational infrastructure in terms of both human resources and the physical structures. Whilst the above rationale posi-

tions higher education as an investment good to which economic returns will accrue at national level[2] the short to medium term problem is how such expansion can be financed and this conundrum presents governments and higher education institutions with a major policy challenge.

The challenge of a technologically mediated global knowledge economy presents a challenge but emerging digital technologies and a belief that they have the capacity to 'transform' education are also seen as a potential solution to increasing participation rates and improving quality within the context of reducing costs although emerging evidence suggests that early hopes may have been over optimistic.[3]

Certainly the economic rationale for expanding education is a powerful and global phenomenon but it is important to note that the assumption that education is directly and causally linked with economic success at either national scale or at the individual level or that economic utility should be a prime driver of educational policy does not go unchallenged (Bailey, 1996; Wolf, 2002).

Whilst the economic rationale for applying technology within the higher education sector is a key policy driver it is accompanied by two others which transcend individual national agendas. It is claimed (Guile, 1998) that, increasingly governments seek to use technology to meet goals of informed democratic participation and that a broad and popular familiarity with technology is essential to this process. A second rationale is related to an 'equity perspective' which seeks to apply technology to ameliorate inequalities in access to higher education. This argument is supported by the assertion that ICT is essentially more equitable than other educational resources. This perspective is challenged in the discussion which follows with reference to a clear 'digital divide' which operates at an international and regional level.

Clearly policy formation at institutional and government level needs to address the relationship between technology and the role and form of higher education. Further, to be successful such policy formation needs to be based on evidence rather than largely unproven assumptions regarding the power of e-learning and emerging technologies to affect fundamental change for the better.

The following discussion examines the forces which can be seen to act as catalysts for change in the higher education sector. This is then matched by the inhibiting factors which act to prevent the effective application of e-learning.

Forces for change

It is broadly accepted that technology is a powerful force for change in the higher education arena but the rapid nature of technological developments coupled with the changing expectations and demands on institutions presents a complex challenge for policy makers at institutional and government level. Strategic policy formation takes place in an environment that is characterised by high levels of complexity, a decision environment which is constantly changing and in which decision criteria are broad (Haddad, 1995).

Despite the difficulties of implementing effective change it is possible to identify several key areas in which ICTs and e-learning are seen to have to potential to act as agents of change. Whilst these 'drivers' of change are discussed under separate headings they are clearly interdependent and their relative significance is rooted in the historical and broader economic and political frameworks of the particular country in which the institution is situated.

An opportunity to expand markets

The development of e-learning in the higher education sector is seen as offering the potential to expand student numbers in a cost effective manner and a way of reaching potential student groups who would not normally engage with a traditional face to face courses in a geographically tied institution (Ryan, 2000). The potential to provide an increased range of courses though virtual media supported by a virtual learning environment offers institutions the opportunity to address expansion in student numbers without incurring the costs of expanding the physical infrastructure of buildings, traditional libraries and on-site ICT infrastructures. A central benefit is seen to be the relative scalability of e-learning based programmes that can rapidly be increased or reduced in response to fluctuations in demand.

A local determinant of the relative importance of technology facilitated opportunities to expand markets rests on the funding mechanisms in-place at a national level. Where nations are in tune with the 'global mega-trend' of increased self-management for institutions within a governmental regulatory framework (Caldwell, 1992) this will lead to a quasi-market for education that drives the uptake of technology.

In contrast, where institutions operate in an environment where the relationship between funding and student numbers is less significant then the impetus to expand is clearly less pronounced.

A central issue thus becomes the extent to which government policy adopts a neo-liberal market approach in which higher education institutions adopt technology as a means to expand student numbers in the most cost-effective manner.

Whilst e-learning presents higher education institutions with a potential answer to the problem of increased constraints on funding and demands to increase student numbers there are issues in relation to access to technology and the loss of quality in terms students perceptions of belonging to a clearly defined community of enquiry (Mason, 1998). These externalities of the development of a quasi-market for higher education are discussed in greater detail below.

The emergence of life-long learning and widening participation

Increasingly governments across Europe and beyond are seeking to promote greater participation in higher education supported by a rationale rooted in the economic necessity to maximise the human resource potential of the population but also to address concerns with respect to social justice[4].

In the UK the current government specifically addresses the issue of social exclusion with respect to access to digital technologies through the work of Policy Action Team 15[5]. The work of this group suggests that such lack of access to digital technologies impacts adversely on the capacity of individuals or groups to actively participate in the labour market. Their work also recognises the potentially negative impact of this factor with respect to accessing educational opportunities and this has, in turn, led to the a number of UK government initiatives to ameliorate this 'digital divide'[6].

As universities seek to expand there is a necessity to address the diverse needs of those who constitute lifelong learners. The profile of this new market varies from the traditional full time student, enrolled on a full time course of study which involves largely face to face interaction and there are clear signs that the pattern of higher educational provision is in the process of diversification. A typology of these emerging or evolving organisations is given by (Hanna, 1998) who lists the following as the

types of institution which have already begun to emerge in response to the changing environment:

Hanna (1998) identifies seven major types of emerging institution:

1. Extended traditional universities;
2. For-profit adult centred universities;
3 Distance education / technology based universities;
4. Corporate universities;
5. University / industry strategic alliances;
6. Degree / certification competency based universities

Global multinational universities.

Barriers to effective change

There is clear evidence of a broad agreement between policy makers at government and institutional level that digital technologies which have already proven themselves powerful catalysts for change in the business and entertainment field carry the potential to have a dramatic impact on the higher education sector (Mason, 1998). It is, however, important to note that the utopian image of institutions transformed into virtual universities with broad and popular appeal is not shared by all commentators (Noll, 2002 p. 35).

In this section we will review some major forces that act in counterpoint to the forces promoting change that was discussed above.

In order to provide a clear and supported discussion it is necessary firstly to define two possible outcomes of the change process. Based on the principle of maturity modelling we can suggest that an organisation seeking to reengineer its structure and process through the deployment of technology might progress through the following stages:[7]

Stage 1 – Dabbling with technology;

Stage 2 – Doing old things in old ways;

Stage 3 – Doing old things in new ways;

Stage 4 – Doing new things in new ways.

Stages 1 and 2 represent an organisation beginning to engage with technology in a piecemeal and ad hoc fashion. A positive policy environment encourages such isolated innovation to be adopted into mainstream practice where technology is regularly used to support teaching, learning and administrative functions, although the fundamental processes remain unchanged. An example of a stage 3, university might be one where audiovisual tech-

nology is regularly used in lectures and the text of lectures are available for download from the university's web site.

Universities operating at stage 1 and 2 can operate within a technology neutral policy environment with developments led by individuals and small groups of innovators. To progress to stage 3 the policy environment needs to change to an actively technology positive state where innovation is financed, systematically planned and roles are adjusted to support innovation.

Whilst the journey from stage 1 to 3 describes an 'evolutionary' approach to organisational development, stage 4 or 'transformation'[8] is far more challenging and requires policy makers to be prepared to engage with change which is disruptive and potentially involves high levels of risk to established core functions. This reluctance to engage with the process of fundamental change and to fuse innovation with a willingness to allow existing processes, systems and roles to decline and if necessary disappear is a major force opposing change. Thus an effective policy environment which support 'abandonment', the process of letting go of elements of an existing organisational culture is as important as one which actively supports innovation (Drucker, 1999).

This enduring tendency for organisations and society in general to adjust to new technologies slowly with a resulting disparity between the capabilities of the technology and the systems, roles, relationships and processes which define the organisation constitutes a 'cultural lag' (Ogburn, 1964). Clearly, each institution's capacity to respond to new opportunities will be affected by factors both internal and external. Internally, culture, micro-politics and vested interest have the capacity to divert and delay change, whilst externally socio-cultural, political-legal and economic influences can constrain the capacity of the institution to respond to opportunities. (Senior, 2002). From the above it can be seen that organisational inertia within the institution and broader social, cultural and political factors both have the capacity to act as serious inhibitors of technological change.

Infrastructure issues and the digital divide

As discussed earlier, in addition to the economic rational for applying e-learning in education, national e-learning strategy and policy documents frequently suggest that digital technologies have a role in ameliorating disparities in access to education.[9] Certainly digital technologies have the capacity to provide easier remote access to educational resources and communication

technologies can supporting wider participation in 'communities of enquiry' via email and virtual learning environments (Preece, 2001) but issues of access to technology still presents a major problem for any institutional or national strategy to develop e-learning as a tool for social inclusion.

An essential element of any strategy to increase access to higher education through the medium of digital technologies must rest on adequate access to hardware and the network infrastructures that are the foundation of e-learning. The inequalities existing both nationally and internationally in access to higher education in its existing form is potentially reinforced unless policy addresses the issue of the 'digital divide'.

Inequalities at international level can be seen in Table 1 with the huge disparities in the percentage of the population who have Internet access in each world region casting doubt on the concept of e-learning as a tool for addressing global inequalities in access to education and in consequence economic power. Clearly any institutional or national policy needs to address the issue of levels of access to technology overall and differential access between different sections of the population. Whilst the table indicates that where Internet access rates are low, the growth rate is high, the conclusion that these regions will eventually catch up must be treated with caution.

Table 1. Internet usage by world region

World region	Penetration (% population)	User growth 2000 – 2006	Range %
North America	69.7	113.7	60.7–69.3
Oceania / Australia	54.1	141.0	1.7–79.8
Europe	38.6	196.3	2.4–68.1
Asia	35.2	231.2	
Latin America and Caribbean	15.4	370.7	1.1–60.0
Africa	3.6	625.8	0.1–15.6
Middle East	1.8	479.3	0.1–52.0
WORLD TOTAL	**16.6**	**198.1**	**0.1–79.8**

Based on data extracted from http://www.internetworldstats.com/stats.htm

Table 2 shows the relationship between Internet use as a percentage of population and per capita income for a range of countries selected to represent varying levels of Internet usage. The ranking in the table clearly shows a relationship between individual income and access to the Internet. Further, the non-linear relationship between the two variables can be seen in Figure 1. This brief analysis suggests that Internet usage grows with income and that the highest growth rate exists at relatively modest increases in personal income. The policy implication for nations with currently low levels of Internet usage is that government intervention potentially achieves greater returns by promoting broader access to technology rather than supporting smaller numbers of expensive, centralised high technology initiatives.

It is clear that levels of personal access to technology is a central factor in promoting life-long learning but it is important to recognise that a range of other factors impact on this variable including awareness, appropriate legal and regulatory frameworks and a cultural openness to change.[10)]

Table 2. Internet usage and GNI per capita – selected countries

Country	**Internet use % population**	**GNI per capita $US**
Bangladesh	0.2	470
Mali	0.6	380
Syria	4.2	1380
Algeria	5.8	2730
Indonesia	8.1	1280
Costa Rica	22.7	4590
Argentina	26.4	4470
Malaysia	40.2	4960
Chile	42.8	5870
France	48.4	34810
Austria	56.8	36980
UK	62.5	37600
Sweden	74.9	41060

Compiled from data at:

http://siteresources.worldbank.org/DATASTATISTICS/Resources/GNIPC.pdf

http://www.internetworldstats.com/stats.htm

In addition to the international issues raised above, there is clear evidence of emerging inequalities between regions and between elements of the population (Norris, 2001). Differentials are found to exist on the basis of gender but across the European Union the two prime determinants of access are age and educational level. For nations seeking to address the issue of inequality in education through e-learning, the tendency for those who have already received higher education to be far more likely to be Internet users than those who have not presents a major barrier to success.

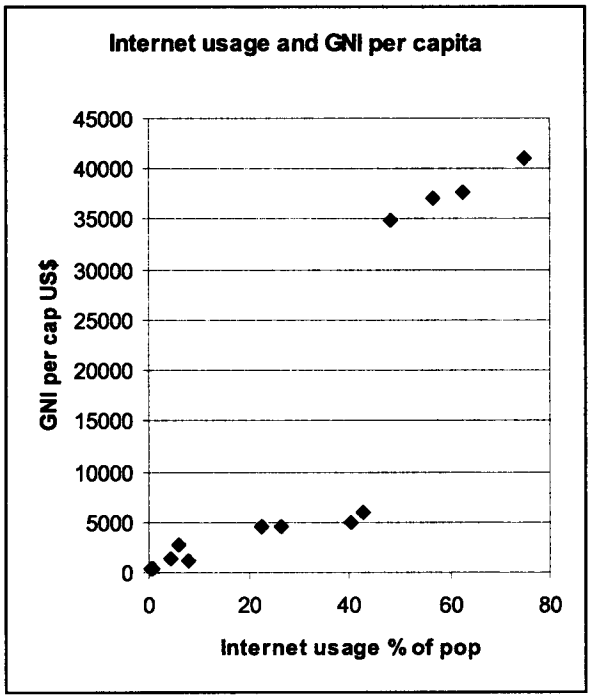

Fig. 1. Connection between income and Internet use

In summary, if digital technologies are to 'transform' higher education to the benefit of economic competitiveness and social cohesion then policy at all levels must address issues of organisational inertia at the level of the institution and the socio-economic environment within which this change is to occur at national level.

The change environment and conclusions

When addressing the public policy making environment from an educational perspective a range of analysis frameworks are available. Based on the direction of the above argument this final section adopts Lichter's (1979) key headings to discuss the higher education change environment with respect to e-learning.

It is suggested that four key factors need to be addressed when analysing and in turn constructing policy.

These four are in turn:

- Situational factors including technological and micro-economic issues;
- Structural factors which include the macro-economic and political environment;
- Cultural factors which address the broader political culture and general culture;
- Environmental factors such as the international political environment and international agreements and alliances

The complex and inextricable links between the above factors create a decision-making environment for policy makers that is characterised by high levels of uncertainty compounded by rapid technological change.

Policy making with respect to e-learning in higher education must address the rapid growth of telecommunications infrastructures and digital networks associated with globalisation and a knowledge based economy whilst seeking to retain those aspects of their institutions which contribute to national cultural identity.

At a structural level, national policy regarding the higher education e-learning issue must be framed within the broader system of economic beliefs which may range from a closely controlled centralised planning approach to a neo-liberal, market led system where the role of central government is diminished.

The role of central government may involve direct intervention in strategic planning at institutional level through it's control over the legislative framework (Braman, 2002, p.268) and/or through financial levers such as direct funding for infrastructural development (Mee, 2006). Alternatively the national level strategy may be based on the belief that minimal intervention is required to allow market forces to create a higher education system that is responsive to changing consumer needs.

Both of the above economic approaches represent the extremes of a continuum and many governments have adopted an approach that combines elements of both perspectives. Whilst it has been suggested that the process of globalisation has weakened the status of the nation-state (Whitty, 2002) this complicates rather than diminishes the role of policy formation at national level.

The national strategy of high levels of direct intervention or a market-based approach defines the planning environment at institutional level. At one extreme institutional policy makers become implementers of a top-down planning approach that potentially undermines their capacity innovate and respond to technological and social change[11]. In contrast the neo-liberal market strategy of government intervention to foster innovation and promote competition potentially exposes a national asset to competition on a global scale with which it may not be able to cope.

In conclusion, the following key issues present themselves to policy makers with respect to e-learning in higher education:

Firstly government policy with respect to e-learning in higher education must demonstrate a clear articulation with the wider policy environment, particularly with macro-economic and social policy.

Secondly policy should seek to balance a need to operate in the context of increasing globalisation with recognition that the core characteristics and institutional values of higher education constitute an element of national cultural identity.

Thirdly a clear delineation is needed between the scope of strategy and planning responsibilities between national governments and institutional policy makers.

Policy and planning in an uncertain and changing environment is surely a challenge but clarity of role between key stakeholders is central to the creation of workable and sustainable strategies.

Notes

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