

Plotting Virtuality: dimensions of eLearning space

Peter J Williams

Abstract: The term *eLearning* enjoys wide currency, but is loosely employed. A lack of clarity as to its nature accompanies a lack of understanding as to its applications and appropriate use. These are important issues, as political, educational and commercial policy-makers need an informed frame of reference from which to make decisions regarding the employment of eLearning alongside or in the place of existing methods of education and training. There is also a need for accurate description of eLearning products for the clients who might use them. This paper seeks to provide contextual and internal analyses of eLearning as an initial stage in the process of creating such a frame of reference. Firstly, eLearning is located within a variety of education and training contexts so as to delineate its boundaries, and an overview is made of ways in which it is employed at higher education level within private, corporate and state-funded systems. Secondly, earlier conceptual models for eLearning are examined and a model is proposed comprising four dimensions of virtual space: *course utility*, *study flexibility*, *delivery technology* and *learning paradigm*. A graphical representation of the dimensional model is used to profile the different contexts for eLearning explored earlier; this method of visualisation affords ready comparison of the variety of ways in which eLearning is employed. Thirdly, a rationale is advanced for these dimensions, which are then discussed in relation to typical learning activities. Finally, consideration is given to how the dimensional model might be applied in the areas of learner appeal, course marketing, educational systems design and course quality evaluation.

Keywords: eLearning, theoretical model

1. Contextualising eLearning

For the purposes of this paper, eLearning is defined contextually as embracing a variety of methods and practices in education and training in which electronic systems are employed. Usually – but not necessarily – this includes communication online: between learners and between learners and tutors. The territory is a large one, extending from the training of vocational skills in commercial and corporate environments to the study of traditional arts and humanities in universities; moreover, the territory is expanding. The Department for Education and Skills for England and Wales has declared eLearning aims for schools together with financial incentives and an infrastructure¹. At the higher education level there was substantial government funding for a UK eUniversity² and, at the time of writing, a draft consultation document defining a national eLearning policy for further and higher education³.

However, according to Drucker⁴, traditional universities are in deep crisis and we should not expect to see campuses in their present form in thirty years' time. Crisis is a term used by many commentators to describe how eLearning in its various forms is associated with impacts upon traditional values and practice in higher education (HE)⁵. Figure 1 summarises a number of economic, technological and political drivers. British universities no longer enjoy what Hague described as a cartel arrangement with the state funding body⁶, and now have to face a burgeoning demand – against a falling unit of resource – for increasingly vocational courses related to the information economy; and all this while in competition with each other in national and international markets⁷ in which HE is becoming commodified and branded⁸.

Some applications of eLearning include support for the *mega-universities*⁹ and *virtual universities*, which are entirely online. The economies of scale and infrastructure afforded by these means of delivery seem an attractive 'techno-scientific' solution¹⁰ to the managerialism which has taken hold of national and institutional policy-makers¹¹. Not yet in direct competition with state-funded higher education are the *corporate universities*, developing considerable experience in the development of eLearning materials for vocational purposes, and likely to become a threat to universities in the near future¹².

The emerging technology of *learning objects* extends opportunities for eLearning and could further undermine traditional HE. The disaggregation of learning materials into standardised ‘bite-sized’ pieces and their storage in semantically-indexed and meta-tagged repositories¹³ enables new combinations to be assembled to meet the needs of individual learners, as assessed by intelligent profiling software¹⁴. Stephenson envisages that:

Courses, as organizing structures for learning – with fixed syllabi, predetermined outcomes and assessments, and strictly timetabled activities imposed by programme managers – will give way to frameworks or shells of support materials surrounding loosely defined fields of study, generalized outcomes and activities pursued by the learners.¹⁵

These possibilities for *learner-managed learning* bear interesting similarity to postmodernist predictions of the demise of traditional campus universities as part of a wider rejection of cultural heritage, and which see the new digital media as playing a key role in this overthrow. Lister *et al.* describe digital media in “...a sense of being the technological correlative of postmodern thought. Speed, flexibility, digitality, hypertextuality have all been posited as characteristic of new media and of postmodernity”¹⁶. This ‘techno-romantic futurism’ is also evident in the views of Raschke, who talks of *hyperlearning* as being “not so much about the command of established, educational ‘content’ as about the capacity to birth new content. ... The internet is not just another resource for learning. It is fast becoming the incubator of knowledge.”¹⁷

2. Earlier conceptual models for eLearning

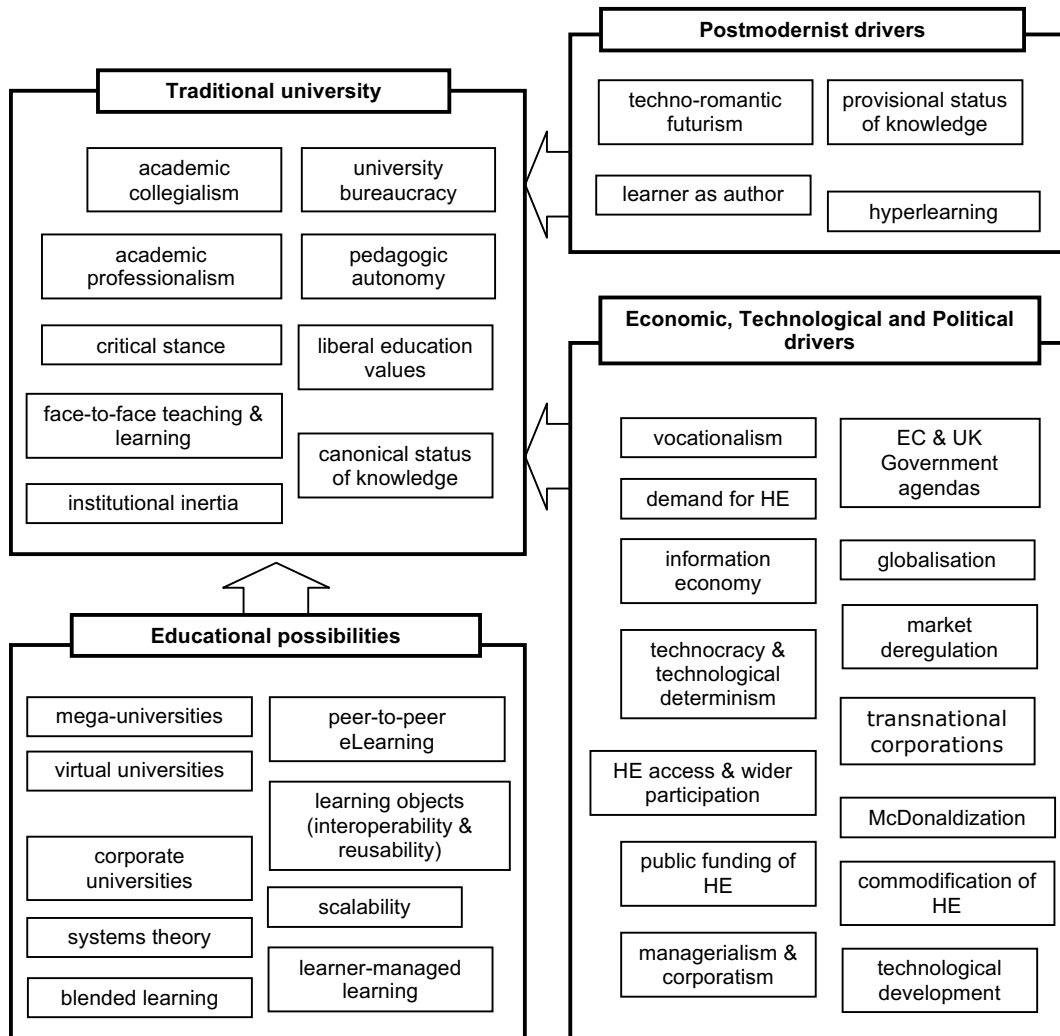
An early typology of teaching approaches in regard of distance education was advanced in 1987 by Boot and Hodgson. This identified two pedagogic orientations on the basis of a commitment to constructionist principles¹⁸. *Dissemination/Instructional* and *Development/Constructionist* orientations were contrasted in terms of, *inter alia*, teaching assumptions made about knowledge, learning, the purpose of education, the tutor’s role, course structure and the nature of assessment. While this model identified some key issues, it was essentially a broad typology from the perspective of the teacher rather than the learner. Also, it was *delivery-independent*, and could have been applied equally to face-to-face as to distance teaching; and – in 1987 – it was pre- World Wide Web.

A more recent model, and one created specifically for Web-based learning & teaching, is the *Online Paradigm Grid* devised by Coomey and Stephenson in 2001 and presented in Figure 2.

The authors undertook an analysis of one hundred published accounts of Web-based learning & teaching, and from this identified four common features: *dialogue*, *involvement*, *support* and *control*. They note that

Most ‘lessons learnt’ focused on the importance of structuring the learning activity and designing the materials in order to promote dialogue, secure active involvement of the learner, provide personal or other support and feedback and enable the learner to exercise the degree of control expected.¹⁹

Figure 1 – eLearning Contexts



These four features were then related to each of the quadrants of the *Online Paradigm Grid*, resulting in rich descriptions of the four paradigms; in addition an advice list was generated for each paradigm on the basis of the ‘lessons learnt’. The north-west quadrant proved to be the most populated, as this most resembles traditional face-to-face teaching and requires the least amount of reworking of existing methods and materials for use in the online environment; the south-east quadrant was the least populated, for opposite reasons. The authors stress the importance for materials designers to have detailed awareness of the characteristics of their chosen course paradigm, warning that “*Students used to clear instructions and narrowly-defined tasks, for instance, will need considerable help with online learning in any sector other than the north west.*” (*ibid.*)

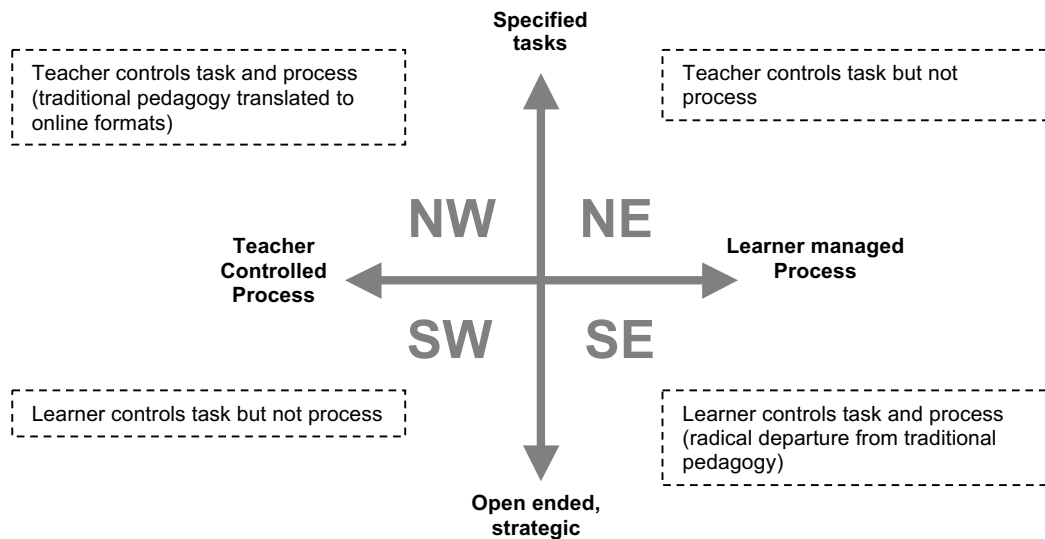


Figure 2 – Online Paradigm Grid
Adapted from Coomey and Stephenson¹⁹

Coomey and Stephenson's model has many strengths. It differs from Boot and Hodgson's, in giving some consideration to the learner's as well as the teacher's perspective – although these are not explicitly related to an epistemic educational stance – and it is *purpose-independent*, where Boot & Hodgson do consider practical relevance and course utility. Like Boot & Hodgson's model, it is delivery-independent in that it also could be applied to wholly face-to-face courses. Neither model takes account of the variety of preferred learning styles which students might adopt. For example, in the continuum model of cognitive styles devised in 1977 by Witkin *et al*, learners range from *field-independent*: serialists / splitters / 'logical theorists' to, at the other end, *field-dependent*: holists / lumpers/ 'imaginative divergers'.

Given the rapid take-up and shifting sands of eLearning, the greater commodification and branding of learning resources and the signs of a growth in learner-managed learning, there is a continual need for the academic community to review and revise its conceptual models. It is important to maintain an informed and up-to-date frame of reference from which policy-makers in political, educational and commercial milieux can make effective decisions about whether and in what forms eLearning might be appropriate. Potential customers in the new eLearning market also need clear and reliable advice about not only content, but also the methods and modes of delivery of the products they might buy.

3. A proposed four-dimensional model

The model proposed here is oriented towards the learner's perspective, so stands in contrast to the two described above. It consists of four dimensions of virtual space: *course utility*, *study flexibility*, *delivery technology* and *learning paradigm*. Each is conceived as independent of the others, comprises three strands and is represented on a four-point scale.

Course Utility (Table 1) is concerned essentially with the 'entry ticket' that utilitarian courses provide to enable students to attain extrinsic goals (*e.g.* vocational qualifications leading to better-paid jobs) and relate to students' general orientations to education²⁰. At the '0' end of the scale is the type of liberal arts course in which the important outcomes are experiential rather than extrinsic. Between these extremes is, for example, a degree course undertaken out of personal interest, but which carries some vocational credit.

Table 1 – Course Utility (CU)

<i>strand</i>	-0-	-1- -2-	-3-
<i>purpose</i>	‘liberal education’	e.g. traditional arts or humanities degree	vocational, utilitarian
<i>outcome</i>	intrinsic, experiential		extrinsic, transferable
<i>assessment</i>	credit accumulation unimportant		credit accumulation crucially important

Study Flexibility (Table 2) comprises three indicators of the overall flexibility of a course. At the ‘3’ end of *materials and sources* would be Stephenson’s “*frameworks or shells of support materials surrounding loosely defined fields of study*” discussed above. The *tasks* strand is the same as the vertical dimension of the *Online Paradigm Grid*.

Table 2 – Study Flexibility (SF)

<i>strand</i>	-0-	-1- -2-	-3-
<i>materials and sources</i>	predetermined, tightly-defined	sharing some of the components of 0 and 3	indicative, loosely-defined
<i>scheduling</i>	lockstep, sequential		flexible, variable
<i>tasks</i>	specified		open-ended, strategic

Delivery Technology (Table 3) considers the types of eLearning activities from the learner’s perspective: from a computer-centred type of course to one in which there is a high degree of face-to-face interaction with teachers and peers. The intermediate blended learning category shares components from both extremes of the dimension.

Table 3 – Delivery Technology (DT)

<i>strand</i>	-0-	-1- -2-	-3-
<i>media</i>	technology-supported face-to-face learning	blended learning	online only
<i>communication</i>	technology-supported face-to-face		online, asynchronous
<i>support</i>	face-to-face only		online only

Learning Paradigm (Table 4) includes the *control* strand, which is the same as the horizontal dimension of the *Online Paradigm Grid*; however, it is broader than this. *Interaction stance* incorporates the notion of hyperlearning and intensive peer interaction, which relate also to an active constructionist orientation. *Cognitive style* is an important descriptor for potential course clients seeking activities to match their own preferred learning orientations.

Table 4 – Learning Paradigm (LP)

<i>strand</i>	-0-	-1- -2-	-3-
<i>interaction stance</i>	passively receiving ‘accepted wisdom’	sharing some of the components of 0 and 3	contributing actively and collaboratively to new knowledge
<i>cognitive style</i>	field-independent		field-dependent
<i>control</i>	teacher controlled		learner managed

The four-point scales are now employed to compare different applications of eLearning. For the sake of illustration three hypothetical scenarios have been categorised. The first – called *blended* – is an example of technology-supported learning within a traditional university in which a virtual learning environment is used to follow up activities initiated in conventional lead lectures. The second – called *corporate* – describes a vocational training course delivered by a corporate university to moderately-

skilled employees to train them in new work procedures. The third – called *active* – is not a formal course but an ongoing process of research and development undertaken by a group of ‘blue sky’ researchers based in universities across three continents and communicating through a variety of sophisticated technologies. Table 5 shows how these have been rated according to the four-dimensional model; Figure 3 presents this data in a graphical form in which the profiles of the three scenarios may be more readily compared.

Table 5 – Comparison of Scenarios

Scenario	CU	SF	DT	LP
Blended: technology-supported face-to-face module in a traditional university	2	0	0	2
Corporate: vocational training in a corporate university	3	1	3	0
Active: flexible and collaborative learning by a globally-distributed research group	1	3	3	3

The model appears an attractive and simple way to summarise and relate the complexities of the many different purposes and implementations of eLearning. However, much needs to be done in moving from this initial conceptual model to a workable inventory which might be applied in practice. For example, the extent to which the four-point scales are true *ordinal* measures as distinct from *nominal* ones needs elucidation. For the purposes of graphical representation this is not a crucial issue; what is more important is that each point-category is supported by valid and reliable descriptors. An empirical grounding is needed in order to construct each of the four dimensions in terms of current and emerging practice; in this way, the inventory could be both a discriminating instrument and a close reflection of praxis.

4. Employing the eLearning model

If it proves possible to develop a workable inventory then the model has the potential to present – from the standpoint of the learner – a more finely-grained summary description of an eLearning course than the earlier models described above. What a potential client might want to know in comparing different types of eLearning courses is answers to questions such as:

- is this course going to be useful for my career? (CU)
- will I have the time to fit it in? (SF)
- have I got the necessary technological access and skills? (DT)
- will it suit the way I like to learn? (LP).

The simplicity of the model could also be effective in helping to convey to policy-makers the idea that eLearning is not a unitary entity which can be simply ‘bolted on’ to existing forms of education and training, and that detailed decisions need to be made about which types and styles of teaching and learning should be adopted. In this situation, policy-makers might ask:

- is there a market for my course? (CU)
- will it be practically feasible for my target clients? (SF)
- will they have the necessary technological access and skills? (DT)
- will it appeal to the variety of their preferred learning styles? (LP).

Similarly, educational systems designers could find use for the model to inform their decision-making process. It might best be used alongside existing instruments for content and course needs analysis and the profiling of target learners²¹.

Finally, the model could be of service in the course validation and quality assurance process. Here, there may be a need for non-specialist and ‘lay assessors’ to appreciate that eLearning courses should not be judged with the same criteria and expectations as conventional courses (for example, the issues of study flexibility (SF) and delivery technology (DT) are much more significant).

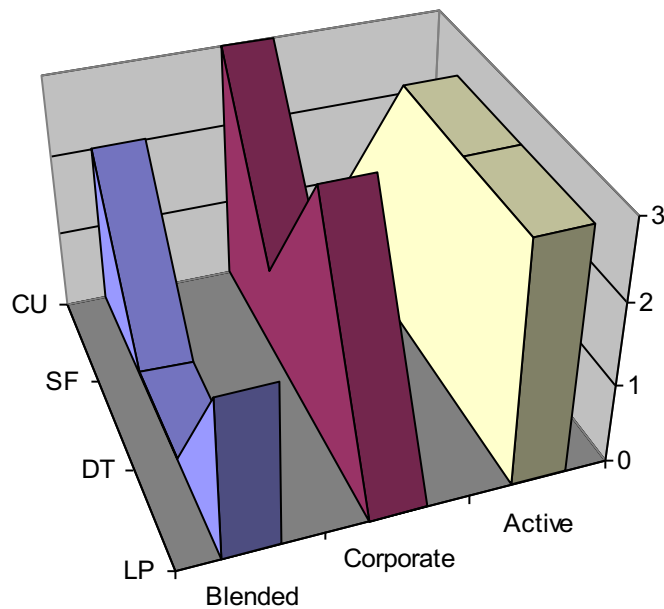


Figure 3 – Profile Comparison of Blended, Corporate and Active Scenarios

5. Conclusion

This paper has identified the need for an up-to-date and accurate conceptual model for eLearning. Existing models have been analysed and a possibly more appropriate and practicable model has been proposed. Although very much at the prototype stage, this model has the potential for development into a detailed and workable instrument which could be of benefit to all participants in this increasingly important aspect of education and training.

Notes

1. Aims for the use of ICT and eLearning in schools are set out in the Department for Education and Skills documents *Transforming the Way We Learn* (2002) and *Fulfilling the Potential: Transforming teaching and learning through ICT in schools* (2003). Free eLearning credits for the purchase of DfES-recommended educational software are issued to schools through the Curriculum Online scheme.
2. The UK eUniversity (UKeU) was created in 2001 in an attempt to compete with private virtual universities for the burgeoning business education market in South Asia. It has subsequently ceased trading and was put up for sale in 2004.
3. Key outcomes of the Department for Education and Skills consultation process led by *Towards a Unified e-Learning Strategy* are currently under implementation.
4. Peter Drucker has written extensively on the difficulties of organisational adaptation to the pressures of the information economy.
5. For example: Preston, 2001; Hayward and Hedge, 2002; Raschke, 2003.
6. In *Beyond Universities*, Douglas Hague argues that British higher education institutions should be able to survive both as competitors and complements of the knowledge industries.
7. Trinidad has written extensively on transnational aspects of online learning.
8. In Ritzer's book *The McDonaldization of Society*, online learning is identified as a 'McDonaldizing' force in higher education.
9. In *Mega-universities and Knowledge Media* John Daniel defines 'mega-universities' as distance education institutions of over 100,000 students.
10. Managerialist issues in higher education are examined in David Seth Preston's *Virtual Values: The University in E-Crisis*.

11. These matters receive extensive commentary by Neave, 1988, and Clarke and Newman, 1997.
12. See Prince and Beaver's examination of the move from collegiate to corporate values in higher education.
13. These ideas are detailed in the CETIS website (Centre for Educational Technology Interoperability Standards).
14. For example, Dickinson and Stewart, 2001.
15. In *Teaching and Learning Online: pedagogies for new technologies*, p.223.
16. In *New Media: A Critical Introduction*, p.192.
17. In *The Digital Revolution and the Coming of the Postmodern University*, p.38.
18. Constructionism is explained in Tenenbaum *et al.*, 2001.
19. Coomey and Stephenson, 2001, pp.40-41.
20. In *Improving Your Students' Learning: Reflections on the Experience of Study*, Alistair Morgan identifies students' general orientation to education as a major factor in their subsequent success.
21. These issues are examined in depth in the books by Terry Evans and David Rowntree (1994).

References

- Boot, R. and Hodgson, V., "Open learning: meaning and experience". In *Beyond Distance Teaching – Towards Open Learning*, edited by V. Hodgson, S. Mann and R. Snell. Buckingham: SRHE/UC Press, 1987.
- CETIS, Centre for Educational Technology Interoperability Standards, <<http://www.cetis.ac.uk>> (1 September 2004).
- Clarke, J. and Newman, J., *The Managerial State: Power, Politics and Ideology in the Remaking of Social Welfare*, London: Sage. 1997.
- Coomey, M. and Stephenson, J., "Online learning: It's all about Dialogue, Involvement, Support and Control - according to the research." In *Teaching & Learning Online: New Pedagogies for New Technologies*, edited by J. Stephenson, London: Kogan Page, 2001.
- Daniel, J., *Mega-universities and Knowledge Media: Technology Strategies for Higher Education*, London: Kogan Page, 1996.
- DfES, *Transforming the Way We Learn*, Department for Education and Skills, London: The Stationery Office, 2002.
- DfES, *Fulfilling the Potential: Transforming teaching and learning through ICT in schools*, Department for Education and Skills, London: The Stationery Office, 2003.
- DfES, *Curriculum Online*, Department for Education and Skills, <<http://www.curriculumonline.gov.uk>> (1 September 2004).
- DfES, *Towards a Unified e-Learning Strategy*, Consultation Document, Department for Education and Skills, London: The Stationery Office, 2003.
- Dickinson, D. and Stewart, V., "Towards an andragogy for living in an information society." In *Teaching and Learning Online: pedagogies for new technologies*, edited by J. Stephenson, J., London: Kogan Page, 2001.
- Drucker, P., "An Interview with Peter Drucker". In *The Crossroads between Lifelong Learning and Information*, Beller, M. & Orr, E., 1998. <<http://www.ascusc.org/jcmc/vol4/issue2/beller.html>> (1 September 2004).
- Evans, T., *Understanding Learners in Open and Distance Education*, London: Kogan Page, 1994.

Hague, D., *Beyond Universities: a New Republic of the Intellect*, Hobart Paper 115, London: Institute of Economic Affairs, 1991.

Hayward, L. and Hedge, N., "Global Distance Education and the Idea of the University", conference papers, *The Idea of Education*, University of Oxford, July 2002, Inter-Disciplinary Net, <<http://www.inter-disciplinary.net/ioe1s5.htm>> (1 September 2004).

Lister, M., Dovey, J., Giddings, S., Grant, I. and Kelly, K., *New Media: A Critical Introduction*, London: Routledge, 2003.

Morgan, A., *Improving Your Students' Learning: Reflections on the Experience of Study*, London: Kogan Page, 1993.

Neave, G., "On the Cultivation of Quality, Efficiency and Enterprise: an overview of recent trends in higher education in Western Europe, 1986-1988", *European Journal of Education* 23 (1988): 7-23.

Preston, D., *Technology, Managerialism and the University*, Fife: Glenrothes Publications, 2001.

Preston, D., "Virtual Values: The University in E-Crisis", *Inter-Disciplinary Net*, 2002, <<http://www.inter-disciplinary.net/Preston%20Paper1.pdf>> (1 September 2004).

Prince, C. and Beaver, G. "The Rise and Rise of the Corporate University: the emerging corporate learning agenda", *International Journal of Management Education* 1 (2001).

Raschke, C., *The Digital Revolution and the Coming of the Postmodern University*, London: RoutledgeFalmer, 2003.

Ritzer, G., *The McDonaldization of Society* (New Century Edition), London: Pine Forge Press, 2000.

Rowntree, D., *Preparing Materials for Open, Distance and Flexible Learning*, London: Kogan Page, 1994.

Stephenson, J. (ed.), *Teaching and Learning Online: pedagogies for new technologies*, London: Kogan Page, 2001.

Tenenbaum, G., Naidu, S., Jegede, O. and Austin, J., "Constructionist Pedagogy in Conventional On-Campus And Distance Learning Practice: An Exploratory Investigation." *Learning and Instruction* 11 (2001): 87-109.

Trinidad, A., "Globalization of Distance Education: Setting a Trans-Atlantic Policy for Collaboration". In *Internationalism in Distance Education: A Vision for Higher Education*, edited by M. Thompson, ACSDE Research Monograph No.10, Pennsylvania State University, USA 1996.

Witkin, H., Moore, C., Goodenough, D. and Cox, P., "Field-Dependent and Field-Independent Cognitive Styles and their Educational Implications." *Review of Educational Research* 47 (1977): 1-64.

Institute for Learning,
University of Hull, UK