The educational possibilities of dis-comfort

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This paper draws on contemporary theory on technological change to problematise the notion of a 'comfort zone' for educational technology. By placing technology in a wider context I question discourses that assume that educational change is driven by progressive technological advance, and which posit a distinct divide between online and face to face education. I also challenge ways of thinking about technology that render invisible the social and cultural dimensions of educational technology practice. Drawing on this contextual analysis, the paper then explores the practical possibilities of moving outside the comfort zone by proposing an alternative engagement with technology for educational technologists, that of creative dis-comfort.

Keywords: educational technology, change theory

Introduction

Are educational technologists really in the comfort zone? And, should we be feeling comfortable with educational technology? These questions direct this paper which aims to problematise the notion of technological comfort, as well as to propose an alternative engagement with technology, that of creative dis-comfort. The pleasure and power of technological expertise is indeed enticing (Hacker, 1989) and many educational technologists are now adept practitioners of a variety of ICTs. Today, educational technologists are working with learning management systems (LMSs), devising asynchronous discussion forums, linking to electronic library resources and the WWW, streaming sound and video, teleconferencing, and deploying other delights of the electronic age. But this sense of comfort derived from the pleasure of expertise relies on narrowing the focus to the tools of trade and neglecting the wider contexts of practice. From the perspective of the lecturing staff with whom we work, the student body for whom we design, and the wider higher education system of which we are part, educational technology is often a very discomforting experience.

A dominant discourse of 'techno-utopianism' (Boshier and MunOnn, 2000) permeates much discussion at both the level of online unit development and broader policy contexts. These confidently upbeat and hopeful discourses concentrate attention on technocentric formulations of educational design (Papert in Shepherd et al., 2002) and miss important questions of power, knowledge, equity and identity that are embedded in educational and technological change (Bromley & Apple, 1998; Roberts & Webster, 2002). To investigate the somewhat paradoxical situation of technological optimism amidst the turmoil of university reform, this paper draws on contemporary theorising on technology and technological change, especially actor network theory, to provide an analytic framework. My aim is to trace the ways in which educational technology is thought about and practiced and question the processes through which a sense of technological comfort may be derived. Koehler et al humorously refer to the SEP field – which is the field of 'somebody else's problem' (2004; p.25). They explain that when 'we consider something as being outside of the arena of our concerns, that something, for all practical purposes, ceases to exist' (p.25-6). I want to build on this notion of invisibility to suggest that a comfort zone involves processes of rendering invisible the messy, contested and conflicting aspects of educational technology. I will consider four processes of narrowing vision or invisibility:

- the equation of educational technology with computers/machines,
- the dualistic divide between online and face to face teaching,
- blackboxing, or the way in which technology appears to be a neutral tool, and
- technological determinism which suggests that progressive technological change drives educational improvement.

To conclude, these insights are applied to consider a productive but uncomfortable practice of educational design.

Educational technology is not (just) about computers

Technology permeates the university environment in obvious ways – computers, websites, LMSs, etc – but it also suffuses higher education in more subtle registers. Definitions of technology stress its complex and multilayered nature, yet the equation of machines with technology remains commonplace. However technology also encompasses ways of doing things, ways of knowing, meanings and organisational contexts (Franklin, 1990; Mackenzie & Wajcman, 1999). Technology is knowledge, process, systems and culture, and is always embedded in contexts and systems that frame meanings and applications. Indeed, we can understand technological artefacts as forms of communication and meaning related to issues of power, identity and culture. The informal and unobtrusive infiltration of technology within the university works alongside the material artefacts helping to shape practices, relationships, images, and identities. Educational technology thus includes not just computers, learning management systems, and so on, but the social and cultural relations of education, influencing how we work, how students learn, what gets counted as work, what gets counted as knowledge, and so on (Nardi and O'Day, 1999).

Understood in these terms, educational technology is mutually constituted by social process and technical artefacts. It is simultaneously technical, discursive and social (Latour, 1993), as much about culture as about computers, and part of the wider project of the commodification of education, and changing labour relations and control structures in the 21st century university. The work of educational technologists is therefore as much cultural as technological, playing a central role in the transformation in higher education technocultures.

Online education is (not) distinctly different from face to face teaching or the sage/guide divide

The popular adage of the 'sage on the stage' versus 'the guide on the side' is characteristic of false dichotomy drawn between face to face teaching and online education. Indeed this formulation has become a widely accepted mantra, which codes online education as 'new' and 'good' and face to face as 'old' and 'bad' (or vice versa for those on the other side of the optimistic/dystopian argument). Much literature repeats this dualistic separation by reproducing tables of comparisons that characterise online education as collaborative, interactive, authentic and flexible, and face to face as passive, traditional and rigid. My point is not to diminish the claims for online education or face to face teaching, but to suggest that a dualistic approach is unproductive in a number of ways. Both pro and anti formulations are based on the idea of technology as independent variable causing change for better or worse. They misconstrue the use of computers as an either/or dualistic divide between an anachronistic presentation of face to face teaching and the imagined active contexts of online learning.

The implications of this false dichotomy are many. On the one hand it fuels a romantic interpretation of face to face as non-technological, unmediated, direct communication, rendering invisible the many technologies involved in 'traditional' teaching. Computers, PowerPoint presentations, photocopiers, overhead projectors, online library catalogues, data beams, and so on, are central to contemporary face to face teaching. Without the 'forms of order' (Winner, 1999) imposed by the architecture of the lecture theatre, the 'sage on the stage' mode of teaching would not be tenable. From the perspective of technology as 'ways of doing something' (Franklin, 1990), clearly lecturing is as much a technology of learning as online web pages.

On the other hand, the sage/guide dichotomy can lead to an uncritical acceptance of online learning (Luke, 2002) and an assumption that pedagogy will be enhanced by the use of technology. Research shows that teacher centred learning environments are still prevalent in most online learning environments (Henricks and Maor, 2004; p.6), and in many cases technology is 'bolted onto' conventional teaching practices (Rizzo, 2003; p.2). I agree with Luke when he suggests that these 'projects of substitution' miss the potential 'to create truly new leaning communities' (Luke, 2002; p. 251).

Further, the claims for online education of flexibility, collaboration and interactivity need critical evaluation. What sort and level of flexibility, what practices of collaboration, and what types of interactivity are really occurring? The tenets of flexibility, interactivity and collaboration so positively associated with educational technology, are often poorly theorised and simply accepted as givens in the

online environment. But discussion forums often lack interactivity, flexibility is always limited by the system (Clegg and Steele, 2002), and collaboration does not equate with cooperation. Wilson (2003), for example questions the nature of online interactivity, arguing that this is an inadequate and oversimplified term that 'situates the user in a utopian discourse of active agency in dialogue with technology' (p.1). She suggests that the term 'interpassivity' may better characterise the grey area between acting and being acted upon that characterises online experience. Likewise Nolan (2003) identifies distinctive types of interactivity suggesting a differentiation between open and closed interactivity. Interaction always takes place within a particular context, and is subject to a range of factors (Hendricks and Maor, 2004; p.27). Flexibility, collaboration and interactivity can all too easily slip into narrowly defined parameters, highlighting the problems of understanding these issues within technicist discourses (Castell et al., 2002). More critical research and practice may be fruitful in order to achieve more than just rhetorical change.

It is hard to situate a comfortable or clear divide between face to face and online in either pedagogical or technological aspects. It should not be forgotten that the practices of active learning promoted in online learning have their origins in the non-wired classroom. The continuities, especially in a pedagogical sense, may be as important as the differences and may help empower teaching staff to shift their thinking and practice. The cause and effect model driving the sage/guide dualism situates educational technologists as miracle workers who can deploy the magic bullet of technology to enact powerful and better education worlds (Castell et al., 2002). Yet the success stories have not matched the promise and we are confronted with re-mediation rather than transformation (Castell et al., 2002). The sage/guide dualism draws attention from more creative approaches and constrains the possibilities of generative practice.

Blackboxing

As the SEP field suggests 'common technologies become invisible and hence unexamined epistemologies' (Postman, 1987). Bruno Latour identifies this process as 'blackboxing' which refers to the way 'technical work is made invisible by its own success' (1999; p.304). When a technical way of doing something runs efficiently and is widely accepted, focus is directed to the inputs and outputs and not to its internal complexity. What this means is that we fail to notice the mediating role of technology and technique, and the constraints and possibilities inherent in its use in particular contexts. The working of things only gets noticed when they break down. The more successful educational technology becomes the more opaque it becomes and the less we concern ourselves with the internal complexity of the process or the assumptions and values that are embedded in it (Latour, 1999; p.304). In this sense, blackboxing is a precursor for comfort, allowing educational technologists to focus on inputs and outputs without worrying too much about process.

Many learning technologies and learning systems have been prematurely blackboxed, leading in some cases to 'one size fits all' courses (Koehler et al., 2004; p.30) and 'template based systems of cognitive compliance' (Castell et al., 2002). Further, Roberts (2002) argues that a 'covert curriculum' of monitoring and surveillance is built into course management systems such as Blackboard (p.4). Clearly, educational technology is not a neutral tool, but neither is it all powerful and defining. However, there is a tendency for educational technologists to ignore the 'mechanics of control' (Roberts, 2002) that are central to some LMSs: the choices built into course management systems have as much to do with bureaucratisation and surveillance, as education (Roberts, 2002). Opening the black box makes visible the inbuilt linearity, monitoring, standardisation and control (Bray, 1990) of some learning management systems, and opens the possibility to reconstruct them in new ways.

Blackboxing is nether positive or negative, it is needed in order to be able to take action and not be overwhelmed by the complexity of our technological worlds. But the comfort gained through blackboxing needs to be balanced against complacency and the acceptance that the current technologies are inevitable or the 'best'. Critical evaluation of blackboxed practices – those aspects of work that we fail to see, and those thought of as 'someone else's problem' – may help allay the sense of false certainty and mastery evident in 'techno-utopian' discourses. Blackboxing is reversible, and it is important to make apparent the assumptions, practices and process that are built into the work of educational technology and which shape the possibilities of outputs.

Technological determinism or why technological change does not (necessarily) drive educational improvement

The cause and effect formulation whereby technology is the motor of progress and change is an example of technological determinism. Technological determinism assumes a linear, progressive and inevitable path of change whereby new inventions spread throughout society by a process of diffusion. The rhetoric of early and late adopters in the uptake of educational technology is an example of this way of thinking. Determinists imagine technology as a force outside education, that education lags behind technological change, and that technology is the decisive factor in the future of the educational system. The ideal of progressive and inevitable change however conceals the power relations and other factors constitutive of the choices inherent in any technological development. In this way technological determinism leads to the invisibility of alternatives.

To counter deterministic notions (both technological and social determinism), actor network theorists suggest that society and technology are not separate spheres, rather 'the social and technical are constituted and distinguished in one movement' (Bijker and Law, 1992; p.201). Education and technology are thus a single process. Actor network theory conceptualises technological change as a process of contestation and stabilisation. Stabilisation occurs when processes of 'negotiation, compromise, conflicts, controversies and deals' around a particular technological development draw to a conclusion and the main social groups involved in technological change reach agreement or consensus (Cockburn and Dilic, 1994; p.14). Once stabilisation of a technology has occurred, and one particular version 'wins out', it is accepted with little thought. The stabilisation of a technology makes the 'winner' look inevitable and 'best'. For example, Blackboard and WebCT are currently 'winning out' in the Learning Management Systems stakes, yet other possibilities that provide different meanings of flexibility, management and learning are possible.

The important point about the path dependency, rather than inevitability, of technological changes is the recognition that things could have been (and hence can be) different. This shifts the focus from the technology itself to the possibility to 'envision new alternative modes of engagement' (Jackson, 2002; p.238). Rather than seeing the future predetermined by technology, Franklin suggests it may be more fruitful to engage in 'discussion of the structuring of the future which global applications of modern technology carry in their wake' (1990; p.48).

Rather than accepting the notion of technological change as a process of diffusion, actor network theorists prefer to think in terms of 'translation' (Bigum, 2000). In this view adoption of an innovation comes as a consequence of the actions of all the humans and nonhumans in the chain of actors who has anything to do with it, with each actor shaping the innovation to their own ends (Tatnal and Davey, 2002; p.1493). Rather than attributing cause and effect, actor network theory traces the various translations and mediations 'through which actors modify, displace, and translate their various and contradictory interests' (Latour, 1999; p.311). Technological change is thus never easy and always resisted, contested and reinterpreted. The complexity of a relational understanding of technology and pedagogy cannot be understated and educational technologists should be wary of simplistic formulations of education change in the face of new technologies.

Dis-comforting practice

What does this analysis mean for the practice of educational design and the trajectory of educational technology? The practices of dualism, blackboxing and other process of the SEP zone are neither good or bad, rather they alert us to the implicit assumptions and informal processes that are as much a part of educational technology as formal practices. Understanding technology and society as mutually constituted, dynamic and contested better matches the uncomfortable, mixed and messy situation of higher education today. It helps elucidate the resistance of some lecturing staff, the techno-boosterism of others, the limitations of LMSs, the creative possibilities of new learning networks, and the lack of success as well as the achievements of educational design strategies. Educational technologists ply their trade within this complex, multifaceted and changing environment, and it is no surprise that so many are struggling to integrate these diverse forces.

Can unsettling the comfort zone of technology be of practical use? While actor network theory is useful for analysing the nature of technological and educational innovation, it has limited ability to identify useful strategies for change. However, the network metaphor remains salient, reminding us of the heterogenous collectives – human and nonhuman – that shape and are shaped by educational practice. The contextual analysis offered by actor network theory reveals the ways in which educational design is as much cultural as technological work, as much about creative partnerships as managing innovation.

My proposal of creative dis-comfort allies with calls for reflective (Hardy and Benson, 2002; Burge, 2001), integrative (Koehler et al., 2004) and generative (Shepherd et al., 2002) design approaches. Koehler et al argue for a transactional stance as an alternative to deterministic visioning of technological change and redefine educational design as the process of constructing a dynamic equilibrium between technology, content and pedagogy (2004; p.50). More than this, action learning approaches could prove useful as practitioners struggle in the 'indeterminate zones' of 'uncertainty, complexity, uniqueness and conflict' (Burge, 2001; p.1). The fluid and unfixed nature of technological practice leaves educational technologists in the tricky situation of having to 'learn new forms of activity which are not here yet' (Rizzo, 2003; p.2). This is especially relevant to educational technologists who have no official 'teaching role'. Even as they perform their duties of academic development educational technologists are promoting an innovation where there is 'no clear model of what the new practices look like' (Rizzo, 2003; p.3). In such open ended contexts educational design practice can be seen as an emergent property of the heterogeneous engagement of humans and nonhumans, including machines, institutions, bureaucracies, educational technologists, lecturing staff, students and so on. To work effectively in these 'indeterminate zones', educational technologists can focus on building relationships, and adopt action research and learning strategies to facilitate the development of new modes of engagement.

Action research is a collection of learning by doing methodologies. The 'CRASP' definition of action research describes it as '**critical** collaborative enquiry by **reflective** practitioners, who are **accountable** in making the results of their enquiry public, **self evaluative** of their practice, and engaged in **participative** problem solving and continuing professional development (Zuber-Skerritt, 1992; p.15). Action research stresses a collaborative approach and is change focused, at its core is inquiry and learning. Collaboration and interaction create a communicative space (Roxa, 2002) for developing alternatives engagements, and foster emergent practice rather than standardised outcomes, making it ideally suited for situations where the outcome cannot be known in advance (Allinson, 2002). Further, the recurring nature of the action cycle accommodates both a step by step approach to change as well as more ambitious projects.

The notion of translation discussed earlier can be further developed to guide a generative active practice of online course development. In this context 'translation' is understood not as fidelity or equivalence, but as a process of 'dynamic interaction within which conceptual boundaries are expanded and residual differences respected' (Papastergiadis, 2000; p.130). Translation is thus a process of interaction through which new meanings can arise. More than transferring units to online environments, such generative practice is more suited to the diverse contexts of contemporary education and could foster a more nuanced engagement with difference. To date there has been far too little discussion of the dynamics of gender, race, ethnicity and other forms of difference in relation to educational technology and the educational design process. Staff and students can become active players in educational design and innovation whereby informal aspects such as trust, reflection, and cooperation are considered alongside formal directives of the move online. These partnerships can help practitioners resist the constraints of management systems designed for control and management but short on education possibility. Technology is never fixed and there is always the potential for reconstruction, often with surprising results. Partnership approaches do not diminish expertise, but place it within wider networks of action that help bridge the cultural/technical divide.

I agree with Castell et al.'s (2002) call for an *educational* theory of technology as opposed to a theory of educational technology. As they emphasise, it is the educational problems of technology that should be concerning us, rather than the problems of educational technology. They urge practitioners to refuse the imperatives of 'accept', 'use', and 'believe', and to eschew the role of 'miracle worker' (Castell et al., 2002).

Making visible forgotten contexts and implicit practices may help redefine the work of educational technologists so that integration, action and reflection become the focus of practice. Technology *is*

changing education, and at the same time social and economic forces are shaping technological developments and remodelling the education system and what knowledge is. There is no brave new world of educational technology, only always incomplete, contested and ongoing change. I am not arguing for less technology or against technology per se, just advocating for less comfortable but more richly collaborative forms of interconnectivity that are wary of narrow vision, standardisation, premature closure and deterministic formulations.

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