"Manning the barricades": Managing organisational boundaries for effective e-learning

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Abstract
This paper explores how the boundaries within organisations, structural and cultural, impact the take-up of an innovation, such as e-learning in a complex higher education and defence environment. In doing so, the paper examines how structure and environment act as impediments, or facilitators, to newer education and training developments and whether these factors can be mitigated against or managed.

The most apparent barriers are structural. These are sanctioned forms that delineate organisational workgroups and entities. They are inextricably meshed with the policies, processes and practices that scaffold teaching and learning activity. Structural dimensions can generally be managed or guided towards a common mission, goal or endpoint. The more pervasive elements, however, are cultural and include issues pertaining to role and identity and working within a more ambiguous environment. Many human factors associated with change may be observed as overt behaviour, but often they emerge as more subtle manifestations, which are both difficult to identify and to manage in organisational settings. Strategies that rely on influence, rather than control, can be more appropriate in the latter case.

The most challenging issues often occur at the boundaries of a system. Commonly these complex issues and behaviours are interpreted as problems, and much of the organisational effort is directed towards overcoming such change barriers. This paper will examine various aspects of boundary behaviour, drawing on theories and models of change, as well providing practical examples and strategies to manage these boundary transitions more effectively.

Keywords:
organisational change, e-learning, boundary, complex adaptive systems

Introduction

Contemporary opinion still widely views e-learning as an educational innovation, although it may be contested that in some tertiary education contexts it struggles to exhibit key 'innovative' criteria such as newness, inventiveness, ingenuity or creativity. Notwithstanding this, and the fact that e-learning now has less claim to being a "radical innovation" (Leifer et al. 2000), this paper contends that e-learning, and the associated terms of online, flexible, distributed or blended learning, are innovative in an evolutionary sense of emerging novelty and newness. This is particularly so for many learners and teachers in specific contexts such as defence and related sectors.

Innovation and the importance of organisational structure

Successful take-up or embedding of educational innovations, such as e-learning, calls for an understanding of organisational context, and the connections and interrelationships of an organisation's constituent parts or elements. Structure has underpinned much of the discourse about organisations and their environment

(Hinings 2004) and structural designs, Pfeffer, argues are "important ways of analyzing and understanding organizations" (Pfeffer, 1997, p198).

Such views are reflected in a management emphasis which typically frames organisational activity in structural terms, particularly as it impacts efficiency and effectiveness (Hinings, 2003). and, further, as it is seen to bestow legitimacy to emergent activity (Di Maggio and Powell, 1983; Meyer and Rowan, 1977).

Thus notions of control and authority are key structural elements which lie at the heart of organisation (Weber, 1947), providing the scaffolding or the glue to manage multiple dimensions of organisational life. Bureaucratic and formal organisational structures exemplify the high dependency placed on structure, but even more recent forms of organising, such as inter-organisational teams, networks and "learning organisations" (Senge, 2006) are structural forms.

The significance of structure in universities and defence organisations (Dekker, 2002, Reinhart, 2008) is particularly notable, highlighting the criticality of the management of the interface between the two sectors. Despite the fact that both university and defence organisations have had long traditions as institutions (Scott, 1995), traditional universities have evolved to a different structural form, the "professional bureaucracy" (Mintzberg, 1991). Defence establishments, on the other hand, are more akin to Mintzberg's (1991) "machine bureaucracy". An additional configuration, the "adhocracy" Mintzburg (1991), aligns better with think tanks, innovation incubators and entrepreneurial start-up companies, offering an organic management style which exhibits minimal formal processes, rules and structures, and governed by consensus or strong ideological leadership.

Innovations and new projects, tend to flourish better within less formal structures, such as the adhocracy. In the initial phases of change or adoption of e-learning in education and training organisations, it has been found that the focus of activity has occurred at the edge or the periphery of the organisation (Rossiter, 2006). Activities can be recognised as pilot projects, sandpits, proof of concept initiatives and test beds. The periphery is where organisations permit maximum freedom and creativity, thus ensuring that the core institutional programmes are intact and less threatened. For example, over recent years a number of different e-learning conceptions, projects and initiatives emerged within the Cranfield University and Defence Academy of the UK context. For example, Cranfield University, a distinctive but postgraduate university with restricted student numbers, has supported numerous LMS platforms including Blackboard, Moodle, Sharepoint and several homegrown solutions. A similar technology mix could also be identified across the various components of the Defence Academy and the wider UK Defence sector. The number of underlying technologies is not necessarily problematic, but the relative segregation of each system and lack of connectivity or interoperability, is symptomatic of an immature take-up model.

Institutional support for such a cottage industry culture tends to be transitory, particularly if senior management forms the view that the e-learning innovation is of strategic importance to their organisation. The pattern is to retire many of the original small projects or innovations, directing the locus of activity towards the 'centre' of the organisation where the control, rules, authority and ownership of the innovation shifts to new stakeholders. This migration can be bumpy and uncomfortable, as the journey involves crossing a number of cultural, processual and structural boundaries. Such boundaries frequently act as barriers to movement and change.

The boundary as a feature of organisational environments

The notion of the "boundary" (Luhmann, 1995), is critical to an understanding of the process of embedding innovations such as e-learning, but to assess the impact of boundaries on organisational life it is important to appreciate the nature of the boundary and its key attributes.

Boundaries are subject to interpretation, depending on context, but commonly are understood as the demarcation line or the edge which divides or delineates two or more spaces, each exhibiting its own particular elements and features. Luhman (1995, p.28) reminds us that boundaries "have the double function of separating and connecting the system environment", but when they are well defined:

> …elements must be attributed either to the system or to the environment. Yet relations between system and environment can exist. Thus a boundary separates elements, but not necessarily relations. It separates events, but lets causal effects pass through (Luhmann, 1995, pp. 28-29)

Kurtz and Snowden's (2003) Cynefin sensemaking framework demonstrates this point, articulating four environments, "known", "knowable", "complex" and "chaotic". These "domains" and key attributes are represented in Figure 1.

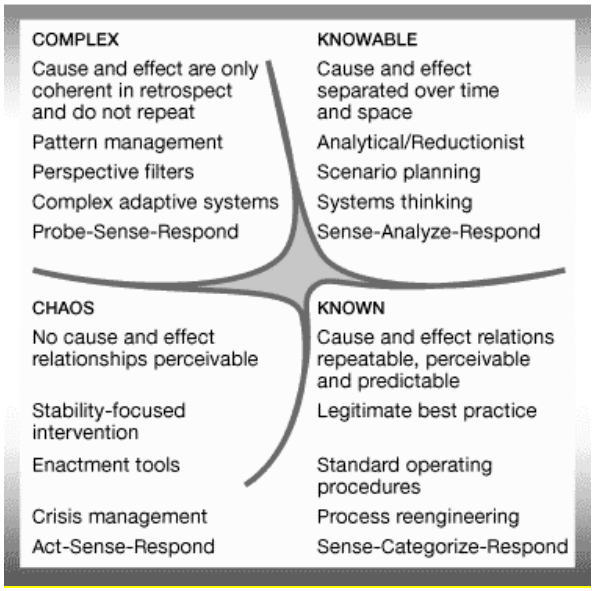

Figure 1 Cynefin Domains (Kurtz and Snowden, 2003, p. 468)

This framework can provide valuable insights to assist decision making with respect to the development and support of educational innovation. Thus, the introduction of e-learning, or a significant adaptation to existing educational practice, could be positioned within a specific domain, based on the responses and behaviours which are native to that domain. For example, a radical innovation, perhaps the introduction of social networking tools in certain contexts, would be less likely to align with an ordered domain such as the "known" (Kurtz and Snowden, 2003), which is populated with attributes such as standardised procedures and process reengineering.

Boundary attributes also vary considerably. A boundary can be sharp and well defined or blurred and fuzzy; rigid and hard or soft and permeable; stable or changeable and so on. The boundary itself may be a narrow or wide space in a physical or cultural sense.

Typically we are more familiar and therefore comfortable with a distinct, relatively narrow boundary. A good example is a fence or wall which clearly establishes the physical limits extended to an individual or group before authority or sanction to proceed is required. In a similar way, the organisational chart offers all stakeholders guidance as to the extent of personal authority or control, and a governing framework covering rules, roles and processes to enable and direct organisational effort. The functional groupings depicted in an organisational chart are useful in a stable known environment where roles are well established and the scope of activities clearly defined. The risk, however, is that such structures create organisational silos and stovepipes, which anchor activities behind rigid and impermeable boundaries. These barriers obstruct or hinder innovation and creativity, especially those which require knowledge, skills and input from beyond a particular organisational group. When transactions need to take place across well defined boundaries they tend to be formal and direct, with the intent of minimising the need for constant interpretation or clarification. Formal contracts or memorandums of understanding are generic examples of such transactions. A specific example is the 22 year contract between Cranfield University and the Ministry of Defence, UK for the provision of courses and academic services, incorporating requirements for e-learning development and modes of flexible and modular course delivery.

The soft boundary is less defined and, therefore, creates a wider space between environments. Typically, such boundary 'zones' are more malleable and changeable and therefore susceptible to unplanned or serendipitous incursions or interventions. An example of this type of transitional environment is the littoral zone around coastlines, where the ebb and flow of the tides makes it difficult to determine the boundary edge and also creates a diverse and changeable ecological milieu for habitation and recreation.

Kurtz and Snowden (2003, p 474) adopt a range of metaphors to further understanding of boundary and boundary crossing attributes. The first is the "shallow river" which can be crossed easily by the majority at any place or time. The second is the "deep chasm" can only be crossed with the help of a structural support, such as a bridge, thus imposing tighter controls on who can cross, the place and time of crossing. The final is the "high plateau" which is deceptive and therefore most dangerous. The danger lies in the fact that individuals can wander unknowingly into a wide open space, loose their sense of direction and may even fall off an unseen precipice. The plateau, while very disorienting, can be used constructively – for example to promote innovation by disrupting the known behavioural patterns in an organisation which is excessively rigid or set in its ways. Alternatively, it can be quite debilitating, for example, in corporate restructures, where groups wander furtively through the high plateau fog seeking support and advocacy (Kurtz and Snowden, 2003, p. 474).

Such transitional boundary spaces feel unfamiliar and are characterised by uncertainties and complexity. The established rules and conventions of the known boundary space no longer applies, new roles and relationships need to be forged, expectations, goals and outcomes mutually negotiated, all of which require time and new skill sets.

Boundary movements and behaviour

Managing the transition across boundaries is as important to the successful progression or evolution of e-learning as understanding and managing the behaviours which occur within the adjoining organisational environments. Failure to manage these transitions, for example through indecisiveness or stalling tactics, can

impact progress in a number of adverse ways producing a stalemate or slow entropy (Luhmann,1995) for an innovation or its key components.

A well defined 'bridge' boundary crossing can facilitate those established or 'known' interactions and transactions which are well understood by all agents and parties. For example, with our Cranfield University and Defence Academy - CMT partnership, standard Prince 2 project change controls are applied to the maintenance programme for the e-learning course, Military Knowledge (MK) I and II (Mackain-Bremner, and Scott, 2006), as that programme has now reached a stable or steady state.

However, if the behaviour patterns and transactions associated with crossing wide and fuzzy boundaries apply, then managing or controlling boundary behaviour becomes more problematic. The interactions and issues surrounding this type of boundary movement are characterised by turbulence, multiple and simultaneous interactions, confusion and lack of consensus. One witnesses the emergence of competing forces and unpredictable behaviour along colliding and intersecting trajectories of activity.

Phases of change and the role of boundary

It has been argued that boundaries can act as a barrier or catalyst to change, impeding or facilitating the take-up of innovations such as e-learning. In order to understand this better it is useful to consider, even briefly, the role of the boundary with respect to models of change. There are multiple models or frameworks explicating innovation take-up (Rogers, 2003; Kotter, 1995) This paper presents a processual framework (Rossiter, 2007) for embedding e-learning comprising two high level phases; an "innovation" start-up phase and a subsequent "embedding" phase. The phases can be further divided into three domains, a "Product (or Innovation)-centric domain", a "Business domain" and a "Complex domain", each with a different focus or emphasis on activities, processes and interactions. The emphasis of Product-centric domain lies with the nature of the e-learning innovation itself and the enthusiasts who support it, whereas there is a shift of focus in the Business domain, to an institutional perspective where organisational process and policy dominates to enable widespread adoption and implementation of scaleable solutions. The Complex domain is the most mature, characterised by sophisticated and highly iterative interactions to accommodate creative new developments.

All three domains are separated by a boundary or transition space, each of which must be successfully negotiated to embed the e-learning innovation. Embedding does not occur simply by institutionalising e-learning through policy and standardised processes, but requires a more mature understanding and oversight of the complex and creative aspects of educational innovation. Therefore, a key role for institutional executives and leaders is to navigate and successfully manage boundary transitions.

An assessment of the current status of the Cranfield - Defence Academy e-learning is at the end of Phase 1, positioned at the boundary of the Product-centric and the Business domain. The history of multiple projects, perspectives and enthusiasts' activity is typical of the first change phase, but significantly there is further evidence of intent, from the University and Defence Academy, to intervene and move ahead, in order to shape or mould activity in ways which meets better the 'whole of organisation' strategic goals and objectives. Examples of such interventions include recognition of the need for new policies and rules, organisational restructuring, and more directed funding towards sanctioned activity (accompanied by cessation of other isolated or non strategic projects).

If, therefore, organisational leaders seek to direct innovation to achieve more strategic outcomes, developing a capacity to manage effectively the boundary issues and interactions is critical, especially with regard to the sustainability of successful innovation.

Nature of boundary issues

Typically the issues which cluster around the soft boundaries are more problematic as they tend to encroach on functional, jurisdictional and professional spheres of organisational life. The unfamiliarity and unpredictability of these issues spawned such terms as "messy" Trist (1983) or "wicked" (Williams, 2002) because they "defy efforts to delineate their boundaries and to identify their causes, and thus to expose their problematic nature" (Rittel and Webber 1973, p. 167). Added complexity is introduced as these issues are capable of metamorphosis, converging and becoming entangled in a web of other factors (Williams, 2002). Participants in this space can end up as cultural or ideological combatants navigating and negotiating an intricate procedural and policy quagmire.

Examples of "messy" e-learning issues, are the competing forces or colliding trajectories which materialise in this space. Examples include the debates which centre on the merits of creativity versus uniformity, equitable access for all versus specialised access for an elite, institutional control versus academic freedom, adoption of scaleable versus customised or flexible solutions.

A familiar and widespread higher education sector "messy" issue relates to course development activities and the content created by staff for online course delivery (Rossiter, 2006). This has arisen at Cranfield, for example, where continuing clarification is required to resolve any potential concerns or disputes about copyright use, IP ownership and management. Furthermore, as requirements for more scaleable, robust or feature-rich e-learning platforms surface, a host of viewpoints and opinions surface from various stakeholder groups about choice of technologies, use, availability, service standards and management.

Dealing with such messy or "wicked issues" requires holistic thinking, skills and a discourse that reflects the relationships and interdependencies, which fall outside the prevailing norms of bureaucracies which champion functionalism, task differentiation, rational and linear thinking (Williams, 2002).

Another characteristic of the problems that occur around boundaries is the breakdown of familiar rules. For example, here the cause and effect rule applies infrequently, causes are difficult to trace back to the source and outcomes are difficult to predict. Williams suggests that , "…responses can be disjointed from causes and a change in the causal agent does not necessarily elicit a proportional change in some variable it affects. It may elicit no response, a dramatic response or a response at certain levels of cause" (Williams, 2002, p104).

Optimal or quick fix solutions rarely suffice in such circumstances as many problems remain intractable and are susceptible to partial solutions or workarounds without a commitment to systemic change. Luke argues that this type of problem does not 'yield readily to single efforts and is beyond the capacity of any one agency or jurisdiction' (Luke 1998, p. 19).

Dilemmas of this nature are largely socially constructed, viewed and interpreted through the unique lens of the individual stakeholders. Individuals build distinctive world views (L-change, 2004) and perceptions based on role, discipline, interests

and experience. Human factors therefore feature prominently, as individuals strive to define new and multiple roles in an environment where 'organizational sovereignty loses credibility and conviction' (Clegg 1990, p. 19).

The multiplicity of roles adopted by individuals adds to the complexity of inter-relationships, particularly when familiar or established roles are challenged within the new and unfamiliar context of boundary spaces. Schon (1987, p. 4) argues that we frame problematic situations based on these pre conceived conceptions.

Conventional conceptions of control are less effective in such environments, whereas persuasion, influence and trust are more helpful. All are mechanisms for co-ordinating social interactions (Bachmann 2001), but it is important to note that decision-making, in this context, must incorporate consensus building and trust at both a personal and a system level. Trust, it is widely acknowledged, underpins effective relationships and as such, acts as a mechanism for coping with uncertainty and complexity (Bachmann 2001).

Theoretical underpinnings

In educational contexts it can be instructive to explore the complex issues and interactions, which occur in and around organisational boundaries, within the framework of systems thinking (Mason, 2008), in particular drawing on non-linear theories such as complexity and chaos (Sterman, 2000). In particular, complex adaptive theories (Stacey, 2000; Lemki and Sabelli, 2008), offer useful insights on self organisation, which can be understood as the emergence of order out of a state of disarray and complexity. This conception highlights the dynamic nature of interactions and relationships and the essential role of disorder or mess within systems in generating new order:

> Contrary to some of our most deep-seated beliefs, mess is the material from which life and creativity are built and it seems that they are built, not according to some overall prior design, but through a process of spontaneous self organisation that produces emergent outcomes (Stacey, 2000, p. 294).

Associated with the concept of self organization is the mutually adapative co-evolutionary process. Ashmos and colleagues (2002) describe the process:

> …systems gradually shed elements or connections of the system that may have been useful in the past, and they adopt new elements and patterns of interrelationships that may be useful in the future… The important point is that the system is not simply trying to adapt to a static environment, but rather the system is learning to adapt to an environment that is itself adapting to the system (Ashmos et al., 2002, p. 192).

Can transitional environments be managed?

Partnering and collaboration

Effective partnering and collaboration entails the management of difference or divergence. Of particular importance, therefore are skills, processes and attitudes which foster the building of shared understandings, trust and partnerships. Collaborative environments, however, far from being cohesive, are often characterised by power relationships that are more contested than in traditional bureaucracies where power, authority and control over resources are often exercised by individuals drawing on their position and status in the hierarchy (Williams, 2002, p117).

Collaborative activity is time consuming, involving a great deal of negotiation over practical issues such as operational priorities and resource allocation. Far from an altruistic exercise, effective partnering also requires one to be realistic and

pragmatic, particularly around detailed operational, contractual, financial and delivery considerations as they impact on individual partnering organisations.

The process is even more demanding and complicated in collectives involving a number of partners (Lowndes and Skelcher, 1998), such the Defence Academy of the UK context. The partners engaged in the development and delivery of e-learning on the Shrivenham site of the Defence Academy include Cranfield University, Kings College London, The Open University, UK , and Serco, the commercial service provider of IT services and facilities management.

Within this environment, there are multiple groups and divisions each contributing a specific set of knowledge, skills, services and expertise to the learning programme. Cranfield University, under its academic provider (AP) contract provides postgraduate courses to the DA-CMT, involving academic input from numerous departments and schools across the University, as well as professional support services for learning and teaching from departments such as the Library, Flexible Learning Support Centre, the e-Learning Team, Knowledge Services and Academic Information Systems. E-learning activity also spans a plethora of groups within the Defence Academy colleges, Joint Services Command Staff College and DA-College Management and Technology. Those with a specific e-learning remit include, Technical Division, the DLPO within Defence Capability Centre, DB Learning, DA Learning (in conjunction with its enabling contractor Logica). Other key players in the e-learning 'soup' include the DTR (Defence Training Review), DCTS (Defence Central Training Services) and British Telecom (contracted to support course delivery and services across all services and the MOD through the Defence Learning Portal). The list is by no means exhaustive.

While formal contracts provide the overarching framework to manage these relationships, effective outcomes depend on a range of formal and informal collaborative techniques. In particular, is it crucial to be able to negotiate well, recognise the need to compromise and to make careful judgments about the balance between benefits and risks for one's own and the other organisations.

Therefore, with respect to the MK I and II, while Cranfield and DA-CMT, have relied on formal production processes, course committees and customer boards for delivery and quality, we are also appreciative of the need to employ more 'influence' rather than 'control' mechanisms to evolve and improve the MK learning experience and product.

Sensemaking and role of the "boundary spanner"

A key role in making sense of the structure and process of collaboration in e-learning environments is that of the "boundary spanner" (Williams, 2002). Sense making (Weick 2001), therefore, incorporates making connections between the disparate professional skills, conceptual understandings and bodies of technical knowledge that apply to e-learning innovations. In boundary spanning activities, this requires an understanding of interrelationships which emerge in different ways and at different stages of a partnership. The ability to be lateral and creative thinkers is important, particularly, as Williams (2002) argues "where the design of effective solutions to complex problems, the skillful negotiation of sustainable partnership agreements involving a number of different agencies, and the mobilization of resource packages is needed" (Williams (2002, p.119).

Trevillion views boundary spanners as "cultural brokers" who, in bridging the gap to another organisation, makes "a real effort to empathize with, and respect anothers'

values and perspectives" (Trevillion 1991, p. 50) An essential dimension of successful inter-organisational working, therefore, involves building and sustaining effective personal relationships which operate across cultural boundaries.

In order to attain the recognition and legitimacy essential to the role of a "boundary spanner", Williams (2002) posits the essential criteria of inter-organisational experience, trans-disciplinary knowledge and cognitive capability. This promotes the key attributes of "understanding the big picture" and "strategic thinking", required by boundary spanners when operating at both strategic and implementation levels.

Conclusion

The impact of the boundary issues and activities on the ability to embed e-learning highlights the importance of leadership and informed decision making in managing boundary environments. Avoiding the natural tendencies for some to 'man the barricades' against the unknown and unwanted change, requires leadership, vision and insight. Reaching the right balance between embracing the positive attributes of complexity and change, but retaining the ability to differentiate and marginalise negative confusion and 'red herrings', demands judgement, sensitivity, perseverance and decisiveness. The ability to discern the difference between promoting agility and flexibility, and from lack of direction in complex organisational settings can appear daunting.

In summary, the organisational focus needs to shift from a preoccupation with intra-organisational activity to the development of inter-organisational capacity, from protecting silos to building networks and joined-up agendas. The traditional benefits accruing from collaboration and networking have included access to new knowledge and greater awareness of leading-edge developments and ideas in other organisations and sectors. In the current economic climate, however, the imperative to co-operate is even stronger. The new return-on-investment may well simply be the capacity to sustain our innovation successes, by working together more effectively across boundaries, sharing both the risks and benefits.

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