International Journal of Arts and Sciences
3(14): 351 – 362 (2010)
CD-ROM. ISSN: 1944-6934
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Examination of Adoption and Diffusion of eLearning: A Comparative Case Study Using Giddens's Theory of Structuration

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Abstract: This exploratory study identifies the factors that influence the adoption and diffusion of instructional technology at five prominent universities. The study examines the organisational factors that enable and inhibit organisational adoption and diffusion of innovation. Using Giddens's Theory of Structuration, data is collected through thirty-seven semi-structured interviews. Five diverse approaches to adoption and diffusions of instructional technology were examined; top-down, integrated top-down and bottom, research driven and project driven approach. The paper argues that senior management need to acknowledge the need to bridge the gap between 'local context' and top-down strategic change. The findings suggest there are tensions between 'signification of meaning', 'power and dominance' and cultural norms in adoption and diffusion of eLearning.

Keywords: Adoption, diffusion, eLearning, structuration, Giddens.

Introduction

Despite the advances in eLearning technologies and plethora of examples of good practice, number of studies report that a great number of lecturers are making little use of technology to genuinely enhance the teaching and learning experience (Bell, Martin and Clarke, 2004), and the adoption of e-Learning has failed to reach the predicted expectations (Salmon, 2005; Birch and Burnett, 2009). Despite all the institutional investment (Collis and van der Wende, 2002), the adoption of eLearning by the lecturers, according to many, have been disappointing (Bell, Martin and Clarke, 2004; Salmon, 2005) and eLearning has failed to revolutionise education and training as predicted by a number of commentators content design and process (Sharpe, Benfield and Francis, 2006). Furthermore, the adoption of learning technologies applications are small-scale initiatives developed in isolation from institutional infrastructure relying on the efforts of local enthusiasts' and goodwill of tutors rather than a widespread, integrated, coherent, institutional phenomena (Marshall, 2004; Salmon, 2005).

Research Rationale

Current studies examining the adoption and diffusion of eLearning can be categorised as having macro- or micro-level approach. Macro-level studies are concerned with systemic change that transforms the entire institution through organisational and structural change (Yates, 2001). The aim of studies in this category is to develop organisational theories in which technology is a major driver for the change. The underlying premise of these approaches is that technological superiority is a precursor for the adoption of innovative products and practices and advanced or superior technologies will, over time, replace inferior

technologies. The main aim of macro-level based approaches is, through the study of organisational factors; enhance diffusion by maximizing the efficiency and effectiveness of an innovation. Thus, macro-level studies have endeavored to identify the unique characteristics of organisations in the process of diffusion of learning technologies (Surry and Farquhar, 1997). Macro-level approaches are limited as they fail to appreciate that users do not necessarily adopt technologically superior products (Surry and Farquhar, 1997), such approaches fail to take into account the complex, ambiguous and networked nature of technologies in social systems (Yang, Yoo, Lyytinen and Ahn, 2003).

Surry and Farquhar (1997) warn against a complete adoption of one approach against another. Research analysis would benefit from a combined approach by combining analysis of institutional factors and taking into account of individual factors that lead to adoption or otherwise of eLearning (Freitas and Oliver, 2005). Furthermore, there needs to be link between macro- and micro-level perspectives and theories to explain change (or stability) in terms of the interaction between individual actions and structural influences (Rogers, 2003). From a theoretical perspective, authors such as Birch and Burnett (2009) and Eynon (2005) have noted the shift in innovation research from solely macro and micro-level perspectives towards a more interactive view which emphasizes the interactions and interconnections between individual actions and structural influences.

However, trawl of the eLearning literature shows that whilst there only a few substantive theoretical accounts which adequately integrate multiple levels of analysis and explain adoption and diffusion of eLearning in terms of the interconnections between structural influences and individual action. Addressing this challenge requires an explanatory framework that takes into account both micro and macro perspectives. Giddens's theory of structuration recognises the need to integrate the two perspectives and provides a framework to analyse interactions between structure and agency. These perspectives enable the integration of both macro and micro levels of analysis by recognising the equal contributions of both structural processes and human agential powers (Parker, 2000).

Applying Structuration Theory

The main aim of structuration theory, according to Giddens, is to reconcile two the long-standing divisions between two differing perspective held by social theorists. On the one hand, he argues, structuralists and functionalists (macro-level studies) have provided explanations of social behaviour in terms of structural forces that limits individual's capability to do things in their own way, on the other hand, studies focusing on the individual as the salient factor (hermeneutics, phenomenology) explain the social life by have generally ignored the influence of external entities. However, Giddens contends that there is no clear-cut line between the difference of emphasis between the two approaches (p. 288) and rejects the view that studies should be able to identify laws which will predict how societies will operate, without looking at the meanings understood by individual actors. Giddens's structuration theory asserts that both perspectives are interlinked, in that, social life is not simply a 'micro'-level activity and conversely it cannot be studied by purely 'macro'-level

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approaches. In his 'duality of structure' theory, Giddens draws together the structuralist traditions, that have emphasised social structure as constraining human behaviour and phenomenological and hermeneutic traditions where human agent has been the major focus. Structuration theory views structure and agency as an inherently dependent duality.

In Giddens's Duality of Structure social structure and human interaction are broken down into three columns (Figure 1). Each structure and interaction are then associated with each other recursively via the linking modalities (interpretive scheme, facility, and norm). Giddens identifies three dimensions of structure; signification, domination and legitimation that are interlinked with corresponding dimension of agency; communication, power and sanctions.

Signification refers to how individuals produce meanings of the structure through communication and language. Agents draw on interpretative schemes to make sense of actors own actions and actions of others. The structure of domination relates to the use of power through the modality of facility. Facility refers to allocative resources (control over objects or materials) and authoritative resources (command over individuals). In the context of eLearning, institutional management are able to exercise power through allocation of resources (for example, providing administrative and technical support, allocating time to develop eLearning courses, (allocative resources) or through issuing guidelines, policy requirements, procedures, that actors are expected to adhere to (authoritative resources). The justification of action focuses on the individuals ability to maintain 'understanding' of their activities so they could provide reasons for their conduct" if necessary (Giddens, 1984, p. 7). Individual actions are guided by application of *normative sanctions*, expressed through the cultural norms prevailing in an organisation. These norms impose social obligations to act in certain ways under particular conditions through cultural norms and values.

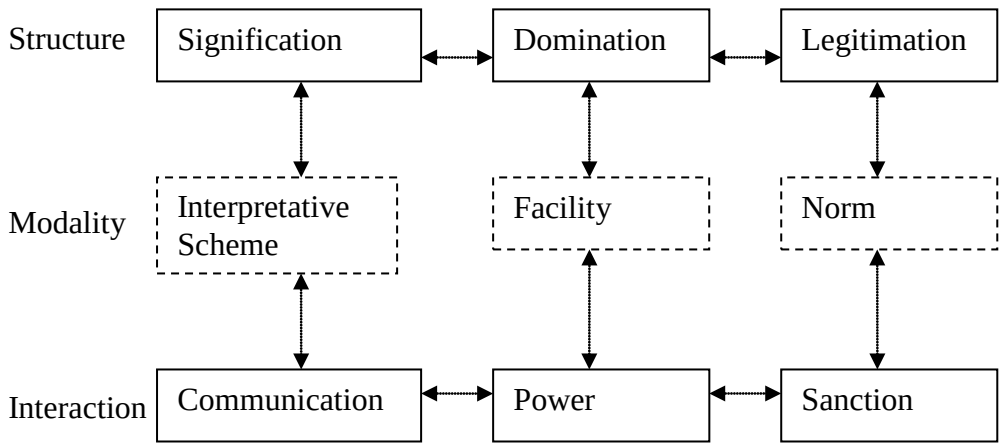

Figure 1: Duality of Structure (Giddens, 1984, p.29)

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Acceptance of eLearning by lecturers of a subject discipline (Eynon, 2005) can determine how and if eLearning is likely to be adopted. Individuals and small groups, such as departments in universities, have their own desires, abilities, histories and preferred artefacts; in other words, they are closely situated (Salmon, 2005). Thus cultural differences between institutions, departments and subject groups have implications for diffusion of eLearning (Gibbs and Gosper 2006), therefore 'one size' of eLearning system does not fit all (Oliver et al., 2002). When undertaking learning technology strategies, policy makers need to be cognizant of the different cultural perspectives and loyalties that exist at different levels of the university organization.

In this study the 'Learning' component of eLearning refers to the processes and systems of learning and instruction. The Association for Educational Communications for Educational Communications and technology, this refers to 'the theory and practice of design, development, utilization, management, and evaluation of processes and resources for learning," (Garrison and Anderson, 2003). Therefore, in this study, eLearning definition excludes management and administrative technologies and systems. The 'e' component of eLearning, in this study, refers to the software (or information systems) to aid the process of learning. These include learning software (purchased from commercial suppliers or developed in-house), these range from institutional Virtual Learning Environments or software for a specific learning activity. The definition excludes the hardware components, such as laptops, overhead projectors, calculators. Internet and Intranet are viewed as hardware for communication and not included in the definition, however, the instructions or software that is being transferred along this form of hardware has been included.

Research Design

Five case studies projects were examined that allowed for different contexts of eLearning adoption and diffusion to be examined. Within each case study a number of respondents were interviewed. Figure 2 provides an overview of the five studies. Case 1 approached eLearning by adopting a 'top-down' approach. The top management of the institution developed the eLearning strategy and issued directives that all lecturers and course teams had to adhere to. Case 2 had adopted a 'devolved' eLearning strategy. This approached was designed to provide an overview of the corporate strategy in terms of eLearning and also allow flexibility for individuals and subject groups to develop their own technology-based courses. Individuals and course teams had the full autonomy in the design of their course and were supported by local management. Cases 3 and 4 were team-based projects with a 'bottom-up' approach. These projects were driven by the course teams who took the full autonomy of the course design. The project investigated in Case 3 was funded by external income. Case 5 was project driven by the eLearning research unit and funded by external revenue. The research unit had designed a specific training and support method which was used to help teams to develop eLearning courses. In Case 5 the strategy was to encourage bottom-up approaches to the adoption of eLearning.

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Site	Focus	Data collection
1	Top-down strategy	2 Senior Management, 5 Middle Management, 5 Lecturers
2	Project driven approach	1 Senior Management, 3 Middle Management, 3 Lecturers
3	Integrated (Top down/Bottom up)	2 Senior Management, 3 Middle Management, 4 Lecturers
4	Course Team (Bottom-up)	1 Senior Management, 2 Middle Management, 2 Lecturers
5	Individual/Course Team (Bottom-up)	1 Senior Management, 2 Middle Management, 3 Lecturers

Figure 2: Overview of Case Studies

Drawing on the structuration theory to conceptualize the diffusion of eLearning composed of three modalities. The micro-analysis focused on examining how participants drew on, and mobilized their context in adopting (or otherwise) eLearning. Using Giddens's structuration theory three components framed the data collection. The interview design focused on how structural, cultural, and agential elements influenced each other in the development of this process. Thus the interview questions sought shifts in meanings, social structure, and their associations with specific participant actions. The macro-analysis was conducted using two guiding questions: (i) What were the causal mechanisms for diffusion of eLearning within the organization; and (ii) How did contextual influences and conditions shape the diffusion of eLearning? The diffusion mechanism were drawn from the literature and contextualised to structuration theory.

Discussion

In the interpretative schemes, communication is the general element of interaction and agents routinely incorporate features of this interaction to construct meanings (Giddens, 1984, p.29). The findings from this case study suggest there are two levels of communication that are significant. First, the influence of top-down communication through eLearning strategy has been proposed as an important factor in the diffusion of eLearning (Lisewski 2004; Stiles and York, 2006). Second, the influence of local communities and ‘near peers’ can have an important bearing on the decisions of adoption of eLearning (Eynon, 2005; Katz and Shapiro 1986).

Whilst, there appeared to be little influence on the adoption of eLearning from eLearning strategy, the interpretative schemes of academic staff appeared to be influenced by collaboration with other members of staff who had successfully developed eLearning courses (Cases 2 and 3). The sharing of ideas and practice with fellow colleagues who had successfully adopted the learning technologies was one of the key enablers in motivating other staff to develop eLearning courses. This ‘sense-making’ through collaboration has been highlighted in the eLearning literature (Mason, 2003; Freitas and Oliver, 2005). Rogers

(2003) states that the rate of innovation adoption is dependent on the social systems where engagement of interrelated units, such as individuals, informal groups, organizations, or complex subsystems solving a mutual problem for a communal goal can have significant influence on decisions to adopt or reject an innovation.

The analysis shows that academic staff draw on their accumulations of knowledge, most typically in the form of pre-existing cognitive frames, shaped by their interactions with students and their subject knowledge. Psychological and pragmatic motivations of the lecturers included; desire to learn about new innovations, enhancing student learning experience, efficiency in delivery of teaching and learning material, and meeting changing student expectations. There was significant difference in how respondents justified their actions. The academic teaching staff rationalised the specific approaches they had adopted by claiming they had understanding of the needs of their subject and students. This legitimised deviations from the institutional requirements. Majority of the lecturing staff suggested that decreasing number of students on traditional-campus based courses was, to some extent, influencing their decision to develop eLearning courses. Giddens proposes that the force underlying individual motivation is psychological anxiety. Anxiety in this sense refers to the knowledge that declining student numbers on traditional campus-based courses may result in the institution considering redeployment or even redundancies. This anxiety then acts as a motivator to mitigate the need that causes anxiety. This anxiety enforces respondents to consider alternatives such as developing eLearning courses.

There were variations in how lecturers viewed eLearning technology. In Cases 1 and 2 the lecturers perceived technology and teaching and learning closely integrated. Their approach was to develop the teaching and learning material using the technology themselves with very little input from central IT support units. Whilst, in Case 3, the project team comprised academic staff who developed the teaching and learning material and once completed forwarded this the learning technologies who produced the technology aspects of the course. The lecturers were more concerned with the teaching aspects of the eLearning project. Thus they were content with leaving all the technology aspects of the project to the learning technologists. For the lecturers in Case 3, the technology only came into existence through their creative action in the development of teaching and learning material. On its own, technology had no existence. In Case 4, the course team, comprising academic and learning technologists, all worked together to develop the course. In Case 5, the learning technologists worked closely with the course teams in attempts to build ‘technical capabilities’ within the lecturers.

However, all the respondents in Case 2 developed eLearning courses in isolation. Lecturers claimed to have very little interaction with near peers, local management or senior management. The findings from this case study contradicted much of the earlier research on social systems as being one of the determinants of the levels of adoption. The respondents were impervious to their social environments, claiming there was no motivational influence from their colleagues. However, this did not appear to influence their decision to develop the eLearning course.

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3(14): 351 – 362 (2010)
CD-ROM. ISSN: 1944-6934
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Power and Domination

The modality of facility is linking of power and domination. The concept of power in Giddens's (1984) duality of structure is closely linked with two types of resources. Allocative resources refer to the "*transformative capacity generating command over objects, goods or material phenomena*" and authoritative, which involve *"transformative capacity generating commands over persons or actors*" (p. 258). These resources focus on components of power that individuals use to affect others (Rose, 1998). Power and domination are exercised through resources that are constituted and reconstituted through individual action.

In all the five case institutions the eLearning strategy was developed and controlled by senior management. The consultation during the development of the strategy was mainly with the senior management of the institution. Almost all of the lecturing staff in all the five case institutions claimed that they were not consulted during the development of the eLearning strategy. Furthermore, there were no mechanisms in place to disseminate the eLearning strategy to the academic teaching staff, thus, most of the academic staff were unaware of the eLearning strategy. In terms of Giddens concept of signification (how individuals produce meanings of the structure through communication and language), academic teaching staff were impervious about the relevance of the strategy to the work in adopting eLearning and suggested that the eLearning strategy had little or no relevance to their work. Number of reasons were cited as to why eLearning strategy was not appropriate for them, including length of the document, not relevant to academic work, unaware of the strategy and perception that eLearning was strategy only important at senior management level. At the structure level, domination is also significant as 'Top down' approaches to introduction of eLearning can signify shift in locus of control from academic teaching staff to designers and developers '*with little or no experience of, or interest in, underlying educational goals*' (Gibbs and Gosper 2006). Study by Eynon (2005) concluded academics felt they should have a greater role in shaping institutional strategies in this area; and a prescriptive "top down" strategy was thought to have a potentially damaging effect on the future adoption of ICTs for teaching and learning. Such sentiments of have been echoed by others, for example, Clegg et al. (2003, p. 47) concluded that a crucial issue for academics in HE is '*who has control over curricula and teaching methodology*'.

In all the five institutions the support and training for eLearning was centralised. However, there were e differences in how this mobilised. In Cases 1 and 2 the training and support was situated in centralised learning technology support units and the lecturers were expected to request this support. In both of these institutions there was an overwhelming view from the lecturers that the support was either inadequate or inappropriate rarely used. In Cases 4 and 5 the Learning and technology support units were part of the course teams. Whilst this caused initial conflicts during the early course team meetings, overall, the lecturers agreed that there was much better working relationship with the support units and this led more positive approach to adoption of eLearning.

Lecturers in all the five case institutions claimed, whilst they had very little interaction with the top management, the support and motivations from middle management was critical. The relationship between the lecturers and their local management was an important enabler of eLearning project. The respondents acknowledged the management support through allocation of resources and in terms of motivation support by regular interaction. Management commitment and support is perceived to be an important factor that can hinder or enable the adoption eLearning (Marshall, 2004; Benson and Palaskas, 2006). Hanson's (2003, p. 119) work examined the diffusion of e-learning in Australian universities, concluded that pivotal to any successful diffusion of eLearning technologies is the importance of management support. Hanson further adds the significant factor as being the 'winning of hearts and minds of lecturers', by encouraging lecturers to adapt their teaching methods to incorporate eLearning. Case studies have also shown that the 'middle level' management have not always been supportive of eLearning approaches (Eynon, 2005; Frietas and Oliver, 2005; Gibbs and Gosper, 2006). However, in this case study, the analysis of the interviews showed the middle management support was an important component leading to the adoption of eLearning.

In two of the institutions (Cases 1 and 2) top-down directives were issued requiring lecturers to conform to specific guidelines in developing eLearning courses. In case 1 there was a strong feeling against this approach and the lecturers petitioned the Vice Chancellor and had the 'checklist' approach with drawn. In Case 2, the lecturers managed to have some of the directives changed from mandatory to optional. The actual materiality of resources is not significant, but rather, to the *capabilities or capacities of agents to command either allocative or authoritative resources* (Giddens, 1984). The lecturers were dismissive and in some cases challenged the domination through the use of these authoritative and allocative resources (Case 1, 2, 3 and 4).

Conclusion

Giddens's structuration theory provided a sensitising framework for understanding the dialectical nature of adoption of eLearning within five universities in the UK. The tensions between institutional structures, such as strategies, training, access to technology, technical support and time resources, and levels of adoption can captured by dialectic of control in Giddens's Theory of Structuration.

The locus of control played a significant part in the adoption of eLearning. Lecturers need to perceive they are able influence the eLearning initiatives within the institutions. They need to be involved in strategic change that is likely to have an influence on their academic roles. Failure to acknowledge this call by lecturers is likely to result in rejection or 'false' compliance to top down directives. This supports the findings of number of studies. Findings from eLearning studies have shown the individuals are more likely to adopt eLearning if they have control over their academic roles in teaching and learning. Simply communicating strategies, policies or directives from the top through formal channels or via emails of intranet are unlikely to be influence lecturers. Senior management need to engage the staff who they rely on to implement their initiatives by appreciating that the drivers for eLearning are

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CD-ROM. ISSN: 1944-6934
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significantly different from the institutional pressures. Pragmatic and psychological drivers influence if and how lecturers adopt eLearning.

> *P1: Top down directives are likely to have no significance to the levels of adoption of eLearning*

> *P2: Pragmatic drivers are more significant than institutional drivers in decisions to adopt eLearning by the lecturing staff.*

Allocative resources, such as training, IT support, time allowance, access to technology, help desks; all these material resources themselves have no structural *relevance unless* they are instantiated in situations through structural principles. Simply making these available using central institutional systems and hoping lecturers will access with them is highly unlikely. This conceptualization of structure is that it is a 'virtual order' of transformative relations that exists only in its instantiations in practices as memory traces. Thus, been in the case of the apparently material allocative resources which might have a 'real existence, but which 'become resources only when incorporated within the processes of structuration (Giddens, 1984, p.33). Indeed, in proposing structure in the minds of social actors and only given substance through their actions, Giddens adopts a specifically subjectivists position. To talk of corporate training plans, centralised IT support or user manuals inscribed in artifacts is therefore inconsistent with Giddens's views.

> *P3: Corporate or centralized diffusion support mechanisms, such as training, IT support, help desks, are significant to the levels of adoption if they are instantiated by the lecturers.*

Structuration theory is concerned with the interplay of agents' actions and social structures in the production, reproduction, transformation and regulation of any social order. The structuration of relations in time and space takes place along the dimensions of signification, domination and legitimation, which are inextricably intertwined, and agents draw on these dimensions as an integrated set. Lecturers use meanings of signification that are drawn from their pragmatic and psychological motivations. Whereas, top management interpretative schemes are driven by external factors such as widening participation, competitive factors and need to reduce financial costs. Contrary to extant literature decisions to adopt or reject eLearning were not influenced by communication from top management but from success of near peers and 'local management'. Thus the use of authoritative resources (non-material resources used in exercising power and domination) by senior management had insignificant influence on the decisions to adopt or reject eLearning by the lecturers. The centralised control of allocative resources, such as access to specialised technical support, training, administrative support and development and delivery time for eLearning courses (common in all five case institutions), had little influence on the lecturers. Only in its instantiations do these allocative resources have 'transformative capacity'.

> *P4: The successful implementation of eLearning by 'near peers' has a positive impact on the decisions and levels to adopt similar practices.*

P5: The use of sanctions and top-down directives are not significant to the levels of adoption of eLearning by the lecturing staff.

The application of Giddens's Theory of Structuration, has demonstrated that the lecturers are essentially knowledgeable about their actions. For Giddens (1984), implicit in the duality of action in which power is a central element, is not only humans *doing*, but also the possibility of their *not doing* or *doing otherwise*. Giddens (1984) argues, in its narrow sense, power is relational and very rarely a unidirectional social process. In duality of action, he further argues, that subordinate agents always have some allocative and authoritative resources that they can drew on to influence the actions and activities of the super ordinates. The analysis of the interview showed that despite the control of allocative and authoritative resources they are unable to control fully the actions of lecturers to adopt eLearning. The lecturers are able to *do otherwise*, for example, utlising other resources or even refuse to conform to the institutional requirements. At the discursive level, they are able to provide explanations of their actions. They are engaged in reflexive monitoring of their own and other conduct, rather than as 'structural dopes' and not passive recipients of the impact of structures. The lecturers maintained the capacity to 'do otherwise' and make a difference in an ongoing course of practices. The lecturers had the ability to intervene or refrain from action thus having influence on adoption processes. Acting at the discursive level of consciousness, lecturers are not powerless; rather, they have several options open to them to bring about a difference to the ongoing course of events.

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