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Information and Communication Technology in Management Learning

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Submitted as part of a PhD as a staff candidate at City University

Cass Business School, Faculty of Management

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Declaration:

I grant powers to the University Librarian to allow the thesis to be copied in whole or in part. This only covers single copies made for study purposes, and does not supersede any copyright limitations that apply to the constituent papers which are included as appendices.

Abstract

This submission combines a number of papers written over a span of eleven years, which document research in the application of information and communication technology (ICT) to management education. In addition an integrating review grounds this research, surveys some of the relevant literature, and analyses the common threads running through the research

The constituent papers discuss the introduction of a wide range of exercises, using innovative information and communication technology (ICT), into teaching at the Business School of City University from 1992 onwards. There is analysis of how using the Internet evolved to add practical value to students' learning experiences, and the papers together record the introduction of such exercises at the Business School before the Internet was widely used outside the academic, research, and United States government communities. These applications of technology in learning were adapted over the years, to respond to changes in the available technology, and in students' expectations, and these changes led to an extensive understanding of students' response to new technology. The inclusion of ICT, and virtual learning methods in courses, where the principal mode of tuition was face-to-face, anticipated the current interest in 'e-learning' by up to ten years

One common thread includes the understanding of both the virtual and the physical environment for learning in a business school, in the light of the technologies available at different periods. A second relates to how some of the tools and techniques most commonly associated with distance learning could also be applied in a face-to-face setting. A third relates to changing views of how the subject of information literacy should be built into the material taught in a business school

The integrating paper locates the constituent papers in relation to literature both about ICT and about pedagogy in higher education. A common dimension is the importance of reflective practice and of knowledge acquisition, and these are used to gain insights into the teaching and learning covered by the papers. In particular there is discussion of how ICT can encourage the framing of new and insightful questions to enhance understanding. While the research is focused on understanding the issues, there is discussion of further research which could lead from it, which could include steps to evaluate the tangible benefits added by ICT.

1. Introduction

1.1 *Outline and scope*

This is the integrating paper for a PhD submission, and should be read in conjunction with the existing papers (referred to here as the *constituent papers*) which also form part of the PhD.

Within this introductory chapter, the sections that follow are a statement of the *key achievements* encompassed in the PhD submission, a summary of the *core concepts* that underlie the author's PhD studies, an outline of the *structure* of the rest of the integrating paper, and a *list of constituent papers*.

1.2 *Key Achievements*

During the period covered by the PhD submission, the author's key achievements in the use of Information and Communication Technology (ICT) could be summarised as:

1. Using e-mail and computer conferencing systems successfully to enhance student learning, before these tools had come into widespread use either within the educational arena or elsewhere.
2. Identifying effective ways in which ICT could add value to business education in a university teaching primarily through face-to-face contact with students
3. Understanding how applications of ICT in higher education needed to adapt over the years in response to changes in students' needs and expectations
4. Gaining insights into how teaching and research can be linked in a climate where ICT is integrated into novel approaches to teaching and learning.

1.3 *Core concepts*

The most important concepts running through this work are those of reflective practice, knowledge acquisition and sharing, and innovative (usually non-didactic) approaches to learning in higher education.

There is a body of work on reflective practice and on thus acquiring knowledge that has come into the mainstream of business and education during the past 15 years. By 'reflective practice' is meant a particular approach to learning which is a form of 'learning by doing' (Schön, 1991). It places an emphasis on framing and reframing questions, based on the learner's experience. By this process of questioning the learner is able to build their own understanding of a subject. In 'acquiring knowledge' the main interest is in 'tacit' knowledge, that cannot easily be summarised in words and is best described by Polanyi's (1968) aphorism: 'we know more than we can say'.

While tacit knowledge is not a new concept, efforts to understand the nature of tacit knowledge, and how it can be shared and acquired, were a characteristic of the second half of the twentieth century. The existence of a tacit dimension is one important distinction between knowledge and data or information (Davenport and Prusak, 2000, Nonaka and Takeuchi, 1995). Since 1990 there have been numerous publications which apply the concepts of knowledge to business and management. (Leonard, 1995; Skyrme, 2001; Edvinsson, 2002)

There is a considerable overlap between the literature on reflection and that on knowledge, and the same concepts are frequently invoked in both topics

The period under review has coincided with a growth in the use and ubiquity of information and communication technology, and this technology offers new opportunities to incorporate reflective practice into management learning, both in universities and in businesses. These opportunities can be seen as ways in which this new technology can yield palpable benefits for management learning. This is in addition to the use of new communication technology to overcome established

geographic boundaries, for instance through distance learning: while important, the overcoming of geographic boundaries is extensively researched elsewhere, so applications where this is the primary benefit are outside the scope of this work.

The research contained here focuses on synthesising these different ideas and identifying new approaches. The key research question has been:

'How can management learning be enhanced, by integrating the acquisition and advancement of knowledge with Information and Communication Technology?'

1.4 Structure

This integrating document presents several different analyses of the constituent papers, and should be read in conjunction with them so that the whole presents a coherent narrative. Its purpose in taking a variety of approaches is to combine the results, of these approaches, into a robust argument for the papers to be read as a consistent piece of research.

In addition to this introductory chapter, the document contains:

- A *methodology and core narrative*, which discusses the methodologies used in the research. Because the emphasis is qualitative and because of the evolution of the research over some years, this chapter also includes a core narrative summarising how the constituent papers form a consistent thread of research.
- A *critical review* of relevant literature having an impact on the research. This surveys relevant work, particularly in the fields of teaching and learning styles, of knowledge and reflective practice, and of the impact of new technology on pedagogy. The purpose of this review is to amplify the extent to which the constituent papers are grounded in this relevant literature, and to locate the constituent papers in terms of relevant theory published elsewhere. In this chapter the starting point is established literature in relevant fields, and this is used to highlight points in the constituent papers.

- An account of the author's *personal journey* over the period covered by the constituent papers. This chapter documents achievements and places the papers in the context of ideas that developed over the years. A requirement for a PhD is

the creation and interpretation of new knowledge, through original research or other advanced scholarship, of a quality to satisfy peer review, extend the forefront of the discipline, and merit publication

(City University, 2003: section 4.1)

and this chapter sets out to emphasise the originality of the approach encapsulated in the constituent papers. There is also a summary timescale for the period under review.

- A *concept map* which lists the relevant domains and subjects. This is used to construct a model, which is consonant with the work covered in the constituent papers. In addition this section is used to identify issues that can be used as lenses through which the constituent papers can be reviewed. This chapter reflects the author's thoughts as they stand at the end of 2003.
- A *commentary on the constituent papers*, which takes a series of important themes and concepts and indicates how they are played out in the different papers. This is the core of the 'reasoned argument' required by the university's regulations for award of a PhD by papers. While the narrative in the previous chapters documents personal steps and achievements in developing this research, the narrative in this chapter focuses on the content of the papers and demonstrates how they are connected. This is also the point where a set of current issues (discussed in more detail subsequently, in the concept map) are used as lenses to review the constituent papers.

This chapter contains a matrix in which the papers are connected to these issues, and it relates the papers back to the university's requirements for award of a PhD degree. It reflects the author's evolving thoughts during the period which included the production of the constituent papers. In addition a repertory grid is used to assist in understanding the constituent papers as an account of progress in the author's research over a number of years.

- *Concluding remarks*, together with a glossary and a bibliography.

The constituent papers are identified in the subsequent chapters by the ‘short names’ given in the table below.

1.5 *List of constituent papers*

#	ShortName	Title
1	Eteaching92	Rich, Martin (1992) "The use of electronic mail and conferencing systems in teaching management students". City University Business School working paper, 1992.
2	GroupWork94	Rich, Martin, (1994) "Building computer supported group work into an MBA programme" International journal of computers in adult education and training, 4(1/2): 3-25
3	CaseStudy95	Rich, Martin (1995) "Supporting a case study exercise on the world wide web" in Cornell, Richard and Murphy, Karen (1995) From Smoke Signals to Satellite II, University of Central Florida, 1995. 121-127
4	Community97	Rich, Martin (1999) "A learning community on the Internet: an exercise with masters students" AMCIS conference, Indianapolis August 1997. 390-392
5	TechTeach97	Holtham, Clive and Rich, Martin (1997) "Learning information systems through a mail-enabled business simulation: the case of Trent Engineering" in Lloyd, Les: Technology and Teaching. Information today inc. 1997. 139-156
6	Weblessons99	Rich, Martin (1999) "A learning community on the Internet: some lessons from using the web" AMCIS conference, Milwaukee August 1999. 942-944
7	Virtual00	Rich, Martin (2000) "Teaching and learning about the virtual organisation" EDEN research workshop, Prague, March 2000.
8	Barriers01	Holtham, Clive and Rich, Martin (2001) "Barriers to academic take up of computer mediated communications and video technologies – the comfort factor" technology in education and training (TET) Prague, May 2001
9	ResLinking02	Holtham, Clive; Murphy, Ciaran, and Rich, Martin (2002) "Business information systems: can relevance link teaching and learning to research?" Scholarship of teaching and learning (SOTL) conference, London, June 2002
10	21stCSpace02	Holtham, Clive and Rich, Martin (2002) "Making space for twenty first century management learning" Educational Innovation in Economics and Business (EDINEB 2002), Guadalajara, June 2002
11	InfoLiteracy03	Rich, Martin, Brown, Ann, and Holtham, Clive (2003) "Information literacy for starting MBAs: issues and dynamics" Business Education Support Team (BEST) conference, Brighton, April 2003
12	ActionRes03	Brown, Ann, Rich, Martin, and Holtham, Clive (2003) "Supporting information literacy for starting MBAs through action research" Electronic journal of business research methods2 (1)

Table 1.1 Papers and ShortNames

2. Methodology and Core Narrative

2.1 Methodology

This section sets out to list clearly identifiable approaches that have been used within the PhD, and also to give a rationale for their use.

As will be discussed further in chapter 4, the overarching approach to the research falls within the general category of mode 2 (Gibbons et al, 1994), and the overall body of research could be regarded as a series of action research activities which together form a narrative.

Gibbons et al have placed their work in the context of a debate on whether mode 1 or mode 2 research should be most important in the future, most notably in pronouncement such as Gibbons (1996). It is important to emphasise that this submission does not seek to take sides in this debate. However there are tangible reasons for mode 2 to provide an appropriate framework for research involving ICT during the 1990s, and having a connection with pedagogy. In particular, mode 2 research acknowledges the extent to which changed circumstances might impose a change in the direction of the research, something that can be seen in the transition from e-mail as a little-used tool (Eteaching92, GroupWork94), to the response to widespread use of the Internet (WebLessons99, Virtual00), to the need to revisit information literacy in an environment where students can be over-confident of their abilities (InfoLiteracy03, ActionRes03). Mode 2, with its emphasis on being transdisciplinary, also fits with areas of research where there is a broad and eclectic range of influences (TechTeach97, 21stCSpace02).

Orlikowski and Iacono (2001) analysed work published in Information Systems Research according to different views of technology. Since this was used as a way of placing a structure on research that had already been published, and since a purpose of this integrating paper is to review the constituent papers, it is instructive to look at the constituent papers in terms of this categorisation. The dominant views of technology expressed in these papers are:

- Technology as social relations tool, within the *tool* view of technology. This is expressed most clearly for example in Eteaching92, with its emphasis on the range of different ways in which participants can communicate using new technology, but is also evident, for example, in Community97, with its viewpoint of how a learning community can be set up.
- Technology as embedded system, within the *ensemble* view of technology. This is most clearly expressed in 21stCspace02, where technology is seen as an integral part of the teaching and learning process which must be intimately connected with its development. It is also evident in ActionRes03 where the response to technology becoming embedded in the organisation is part of the challenge that the paper sets out to meet, though arguably the connection, throughout the research, between practical experiences and policy decisions reflects this view of technology.

Reviewing the papers as a whole, there is a shift from the *tool* view of technology in the earlier papers to the *ensemble* view in the later papers, representing a trend in business towards technology being increasingly embedded within an organisation.

A subsidiary view expressed is that of technology as diffusion, within the *proxy* view of technology, most notably in Barriers01 which focuses on difficulties which can be encountered in introducing new technology. Given the focus within the research on established institutions, the change process (including diffusion of innovation) is relevant throughout.

Specific methodologies which have influenced this work are:

- *Action research* is mentioned in the earlier papers (eg GroupWork94), because Trent Engineering has one important characteristic of action research: the subjects (students participating in the MBA programme) also adopt the rôle of researchers. A more complete definition would include the need for some form of intervention, or action, in response to what was observed (Baskerville and Wood-Harper, 2002). It is harder to identify interventions in which the students would have participated in Trent Engineering. However one of the later papers on information literacy specifically analyses an approach to teaching and learning,

and the scope for incremental improvement to the learning experience, in terms of action research (ActionRes03). Checkland and Howells (1998) establish action research as a suitable approach for research in the field of information systems; Baskerville and Wood-Harper (2002) cite Checkland's work as offering one link between action research and inquiry into information systems

- *Narrative* approaches are very powerful in constructing and creating stories where 'harder' research methods might not yield results which are of any use.

The development of these learning experiences in itself constitutes a powerful narrative and this is reinforced by the summary below in 2.4. This narrative takes place against the backdrop of the rapid growth in the use of the Internet.

As an aside, e-learning is approaching the level of maturity where large-scale quantitative surveys of outcomes may be useful in determining future policies, and as discussed in chapter 4 there is scope to build future mode 1 research on the foundations of the material comprised here. But, during the formative stages of the widespread use of ICT in learning covered here, quantitative approaches are of limited value. For instance the student evaluation scores for Trent Engineering, quoted in GroupWork94, while satisfying a desire to include some numbers, tell us very little about how appropriate the method exemplified by Trent might be in higher education in the future. Narrative approaches depend on the ability to build a coherent and consistent story out of series of events.

The section on the timescale and journey is one application of a narrative approach: the existence of a reasoned argument within the commentary on the constituent papers also depends on creating a narrative. There are also very clear sub-narratives within the documents: negative feedback from students who dismissed the innovative approaches described, as a clumsy attempt by faculty to get the students to use (then) obscure electronic networks, contributed to one identifiable sub-narrative within the early papers. Polkinghorne (1988: 36) writes at length on the contribution of narrative to research: his observation that narrative is 'a form of meaning making' is perhaps most pertinent to this work. Golden-Biddle and Locke (1997) similarly view qualitative research in terms of

writing a narrative, and use some of the language of storytelling, for instance in their advice to researchers to engage their readers' interest early in the narrative.

- *Interpretive* research. In the classification used by Myers and Avison (2002) it would fall into this broad sub-category within qualitative research because of its emphasis on making sense of issues, for example through the use of language.

An interpretive approach is appropriate here, because the work traces an evolving thread of research in a field that was not well understood in the early stages of the work. Additionally, language is relevant because the research centres around the spoken and written discourse between learners and educators.

Orlikowski and Baroudi (2002: 65), note that 'the research methods appropriate to generating valid interpretive knowledge are field studies, as these examine humans within their social settings.' The papers relating to the e-mail implementation of Trent Engineering in particular (Eteaching92, GroupWork94, CaseStudy95, TechTeach97, Community97) constitute a set of field studies. The account of teaching and learning about the virtual organisation (Virtual01) could similarly be regarded as a field study.

- *Case studies* are a well-established tool in business education: many of the papers describe case study exercises and they in themselves constitute case studies which should be of interest to a wider audience. As a teaching tool, they form part of the standard repertoire of pedagogic material for business students. As a research tool case studies are most valuable for building theory (Eisenhardt, 1989), and generating and discussing hypotheses which might in turn be tested using empirical research; this connects with the view suggested in chapter 4 that future empirical research could flow from the work encapsulated here.

These approaches have been chosen because they fit the nature of the result, which is applied, set in the context of rapid change and an unpredictable future, and deals with benefits which are difficult to quantify. The complete body of work sets out to achieve a careful, rigorous, approach; through combining a number of research instruments and a number of perspectives, a measure of triangulation is achieved. In particular chapter 6

combines a commentary on the constituent papers as they would have been read when first written, with a reflective commentary on how they should be read when the chapter was drafted, towards the end of 2003. This integrating document strengthens the methodological base for the constituent papers, both by placing them in the context of mode 2 research and reflective practice, and by amplifying the connection to the relevant literature.

Attention to detail is achieved within the constituent papers through the description of particular learning experiences. It is particularly evident in the descriptions of electronic dialogue in GroupWork94, and the account of very specific barriers to the introduction of technology in Barriers01. It is also evident in the careful and methodical approach embodied in the application of action research to the development of teaching material discussed in ActionRes03.

Additionally, the collaborative nature of many of the papers introduces an element of peer review, and ensures the contribution of more than one person's viewpoint to the paper. Collaborative work is also identified by Gibbons et al (1994) as characteristic of mode 2 research.

The principal limitations of this approach are:

- The qualitative emphasis limits the scope for presenting unambiguous evidence that new technology introduces benefits, or even that it improves, for example, the fit between learning materials and students' learning strategies. While the author's future plans encompass further empirical work, this would not address the impossibility of gathering quantitative data about learning during the period under review.
- The constituent papers were written with a variety of different purposes in mind, albeit around one common and focused theme of research, and in particular were not written as parts of a PhD submission. Therefore there is some variation in the style, language, and dominant approaches used, although a common overarching approach informs all of the papers.

2.2 *Action research*

Action research originates from the work of Lewin (1997) as a response partly to the difficulty in identifying *measurable* stages which can be used to gauge achievement. This purpose becomes a powerful argument for using action research to investigate the core PhD question of how management learning can be enhanced, where enhancement is a difficult concept to measure. Action research additionally implies recognition of the extent to which the topic under investigation is part of a complicated web of issues which can be interrelated, and the need to go beyond pure diagnosis (for example through surveys) and into experimentation through some course of action.

Gold (1999) incidentally suggests that Lewin did not in fact practise action research, and dismisses Lewin's work on nutrition, for example, as almost a textbook example of action research except that no intervention actually takes place

Nevertheless Lewin does describe his own work in ways which support the case for the adoption of action research as a methodology. For instance, when discussing the relationship between minority communities in Connecticut, he noted evidence that workshops with community leaders seemed to be productive in enhancing their individual skills in dealing with conflict, apparently because the workshops took account of how much individual behaviour was rooted in cultural standards and collective actions. However these workshops did not lead to any effective changes: while community leaders came away from them enthused with new ideas, they often failed sustain their enthusiasm long enough to put the ideas into practice (Lewin, 1997). This effect is possibly the reason for Gold's criticism of Lewin's lack of intervention. So one aim of action research is to ensure follow-through of practical ideas. This aim is reflected in the practical orientation of the constituent papers.

Action research derives from *field theory*, which is about gradual, tentative, change because it focuses on the forces acting on an entity at any one time: the underlying questions are all about what is happening at the present (the principle of *contemporaneity*). The forces can be defined in very precise mathematical terms in a sequence of equations, though that would be inappropriate in the present context given the qualitative approach adopted throughout the constituent papers. These forces derive from tensions which in

turn originate because of the discontinuity between an individual's present position and their desired position (Lewin, 1997).

Argyris et al (1985) provide an important link between action research and reflection-in-action (Schön, 1983): as discussed further in chapter 5, both the value added to learning in the constituent papers, and the process of assembling this PhD submission, constitute examples of reflection-in-action.

Paraphrasing and simplifying, action science (Argyris' term, which can be regarded as encompassing action research but also extending to areas of science which could not be thought of as research) has three key features:

1. (in common with other forms of science) it is to do with determining a number of theoretical propositions that can then be tested
2. it leads to knowledge that can be implemented by human beings in some sort of context
3. it could lead to fundamental changes, in the light of knowledge of alternatives to the status quo that might be investigated by a process of action science.

In the case of this PhD submission, these are represented by (1) the fundamental research question running through the work, (2) the implementation throughout the period under review of learning experiences, and (3) the integration of the work with fundamental and lasting changes in the learning environment and the tools available.

Schön et al (1984) reinforce the connection between reflection-in-action and research. An important issue (and Schön et al are meticulous in their logic in using their own experience to illustrate the point) is the lack of replicability of findings and interventions. An intervention might be right for a particular place at a particular time, but it is impossible to infer that the same intervention might work in a different place, and difficult to establish what sort of conditions might arise in the future and what sort of intervention they might demand. The experiments defined here take place in messy, socially constructed, worlds where the rules of behaviour do not necessarily lend themselves to adaptation to a different environment; the same can be said of the complex environment within which the PhD work is set.

Hult and Lennung (1980) set out to synthesise others' work on action research and to arrive at a working definition. Their starting point is pertinent, because it suggests that social science can produce findings and increased knowledge, but there is no certainty that such knowledge is fed back and used. Their proposed definition of action research (deconstructed in some detail within the paper) encapsulates these important characteristics:

- It simultaneously assists practical problem-solving and the expansion of scientific knowledge
- It uses feedback in a cyclical process
- It sets out to understand change processes in social situations
- It is undertaken within an ethical framework (and a minimum requirement, in the authors' terms, for researchers is to state their 'value premises')

There are issues which are also dealt with by Schein (1987), notably the difference between social research where studies might be carried out *on* a social system, and action research where they are carried out *within* a social system.

The research within the constituent documents also draws on concepts from ethnography, notably for example in GroupWork94 and Barriers00, which set out to understand the experiences of either students or staff. Harvey and Myers (2002), observe that ethnography originated because of researchers' desires to understand the context of cultural practices that might seem unfamiliar to them. There are clear resonances between early ethnographers' desires to create a framework where a particular set of cultural practices made sense, and the need in the constituent papers to place innovative approaches to teaching and learning in the context of the university's policies and the needs of its students.

However Schein (1987) posits ethnography and action research as contrasting approaches. He characterises action research as the model used by clinicians, and describes its underlying assumption that it is impossible to understand a human system without trying to change it (as a pragmatist, the author would read this, in the organisational context, as a warning against complacency, and a reminder that there is

always scope for improving even the most apparently perfect system). Arguably, this represents the purpose of clinicians: they are only invited to participate in a process where some improvement is desired, and that improvement should be manifested as action and not merely as understanding.

In Schein's perspective the ethnographer sees an organisation as something to be observed and not 'perturbed'. This slightly reverential view would appear more appropriate to organisations where the researcher can truly take a detached view, and also ones where any sort of disturbance might be considered undesirable, than the environment that is the context here: the PhD work covered here took place within the researcher's workplace during a period of great flux, not an environment conducive to detachment. Where an ethnographer does intervene, it should be in a way that minimises any effect on the system. The ethnographer does recognise the need to intervene on occasions, but it should never be a primary aim.

This element of intervention locates the constituent papers primarily as action research (on Schein's definitions at least) and not as ethnography.

There is also an important difference in how research in the two categories can be validated. Schein suggests that ethnographers strive for replicability: for the idea that the same, or another, ethnographer could observe the same dynamics in a group on a different occasion. For clinicians this is unrealistic: since they seek to change things, replicability is neither desired nor expected. Instead the suggestion is that 'improvement' should be the test of validity, although this is hard to measure and it is very susceptible to the choice of metrics if you do try and measure it. Schein suggests that the ultimate validation test is whether the result of a particular intervention can be predicted – a sound aim for a medical researcher searching for a cure for a particular ailment, but a much more difficult one to adopt when adapting an organisational dynamic to fit an unknown set of conditions in the future.

Baskerville and Wood-Harper (2002: 144) write that 'action research is regarded by many as the ideal post-positive social scientific research method for information systems research'. They are mindful of the difficulties in achieving scientific rigour through action research, but suggest characteristics which, if present, can contribute to a rigorous

approach to action research. These include the establishment of an ethical infrastructure, and iterative phases during which action can be planned and observed. Within the constituent papers, ActionRes02 explicitly relates how these conditions are achieved in one particular case.

Gummesson (2000) adopts the term *management action science* referring to an approach where insightful discussion of case studies is more important than generalisability. He writes at some length about his suggested paradigm and asks whether action science is possible, and valid, in studying management; he suggests that a researcher within this paradigm should 'generate a specific (local) theory which is then tested and modified through action' (Gummesson, 2000: 208). On this definition the constituent documents, where the local theory applies to City university, fit Gummesson's paradigm very well.

2.3 *Epistemology and ontology*

Walsham (2002: 103) defines *epistemology* as 'the nature of knowledge claims' and *ontology* as 'the nature of reality'.

The epistemology adopted throughout this work is predominantly non-positivist in that it accepts a multiplicity of views and perspectives. This is assumed in the research question, with the implication that enhancement of learning can take many different forms in different contexts. It is consistent with the belief stated in 3.3 about students' diverse expectations. Additionally, a non-positivist approach recognises the nature of a subject where change is rapid, unpredictable, and unlikely to cease in the foreseeable future. So the constituent papers and this integrating paper set out to review a continuing, shifting, set of activities, an aim that cannot be reconciled easily with a positivist view where an aim might be to understand a phenomenon in its entirety.

More specifically, the epistemology presumed by the constituent papers could be regarded as *interpretive*. Orlikowski and Baroudi (2002: 55) suggest that interpretive research is defined in terms of the meaning assigned by participants – clearly the case in this instance – and observe that 'generalisation from the setting... to a population is not sought' – again this is the case, as might be expected, for the constituent papers which

relate to specific instances, and to a set of conditions which cannot necessarily be replicated in other settings.

This pattern of a continually changing reality also informs the research instruments adopted in chapter 6. Both the repertory grid, and the matrix using issues as lenses, set out to provide an analysis of the author's thoughts and observations at a particular stage during the period under review. This is consistent with the principle of contemporaneity in field theory mentioned above. The constituent papers generally assume a non-positivist perspective, and this has been further validated by the process of reflecting on these papers, and observing the differences in the context for learning over the years. In particular it is clear from the constituent papers that the effect of ICT, especially, on learning processes has changed over the years in ways that were impossible to predict.

The emphasis on knowledge and reflection is also consonant with a non-positivist view. Habermas (1987: 67) observes that that 'positivism marks the end of the theory of knowledge': in a historical review he suggests that with the emergence of a positivist epistemology, knowledge was replaced by science, and indeed even the idea of epistemology was replaced by science, because in that view 'the knowing subject is no longer the system of reference'. Later, with the emergence of psychoanalysis, self-reflection appeared as a scientific procedure, a stage which Habermas views as important in the legitimisation of a non-positivist viewpoint.

Schön et al (1984) present reflection-in-action in the context of an argument against rigorous scientific analysis (this could be construed as an argument against positivism). There are interesting comments here with much wider implications than might at first be apparent – notably comments on the inadequacy of some measures for determining whether children were in fact malnourished purely in terms of rate of growth in height and weight. But Schön also comments that he is using 'dirty' data (his term), in that it has not been collected with the sort of rigour that would be imposed by a quasi-experimental approach. This could be read as a plea for cleaner data, but in practice is a plea to value the 'dirty' data, and to adopt an approach to science where its value is recognised.

Smith (2001) characterises Schön's contribution as being the development of an epistemology of practice – one in which inferences can be drawn from the experiences of a small number of influential practitioners. This fits well with the definition of epistemology above: Schön is claiming here the knowledge derived from particular experiences. Smith quotes Schön's account of the rigour within his approach as being 'both like and unlike' the rigour within more traditional scientific approaches.

Argyris et al (1985) approach the question of an epistemology of practice, by asking about the kind of knowledge that human beings need to carry out actions. A theme which recurs here is the relationship of means (or possible purposes) to ends – and this is used to draw out the inadequacy *in the context of action science* of the positivist emphasis on separation of fact and value.

Bernstein (1976) reviews the positivist stance, along with a number of other philosophical issues, in the light of 'pure' scientific discourse. He is not totally unsympathetic to positivism, but the strand running through his work is to do with the emergence of the *critical theory* of society – almost a statement that questioning and re-questioning is the key to advancing understanding of the world. There are clear parallels here between reflection-in-action and this view of a non-positivist world, and it is noteworthy that Schön et al (1984) invoke Bernstein in support of the view that positivism offers only a greatly simplified view, even of the natural sciences.

Interestingly, it is suggested that reflective practice introduces a precaution against errors in data collection because it involves the people in the field in understanding the process, and so means that they are more likely to recognise when they are picking up incorrect data. In the learning experiences described in the constituent papers, the students and staff who participate are (knowing) actors in the experimental process, a reason to value the messy data that they provide.

Approaches to *ontology* can be classified as:

- *External realism* where reality exists independently of our construction of it
- *Internal realism* where reality-for-us is an intersubjective construction of the shared human cognitive apparatus (Archer, 1988: 273)

- *Subjective idealism* where each person constructs his or her own reality.

The first two of these are referred to by Walsham (2002).

Internal realism is the closest to the approach here, given the importance attached to social interaction in the work. It also informs the issues and constructs used in the analysis in chapter 6, notably the emphasis on learning styles and strategies, which places particular importance on individuals' perception of reality, and also the shared perception of a group of individuals with different viewpoints.

2.4 *Core narrative*

Narrative approaches are identified above as a useful tool for explaining and understanding the material covered here. The central narrative could be written as follows:

The constituent papers centre around experiences of using ICT to enhance management learning, in an environment where the primary mode of instruction is face-to-face. There is scope for adding value to the learning experience by encouraging the use of electronic channels for discussion and reflection. The extent to which students are receptive to such an approach depends on the students' preferred learning approaches and strategies: however new technology offers opportunities to tailor the learning process to individual preferences and also to respond to the need to move away from a didactic, lecture-based, approach to teaching.

Reflection-in-action (Schön, 1991) is a technique that encourages the framing and re-framing of questions to foster deep understanding of a topic, and communication technology can add value by enabling the use of this approach.

During the eleven years spanned by the papers, there were immense changes in the technology available, and also in the typical perception of technology among participants in management learning. Most notably, this period covered the transition from end-user computing being dominated by stand-alone personal computers, to the Internet being an important focus for many applications of technology. Although the Internet as a

personal and business tool was embryonic when the earliest of these papers was written, electronic mail and text-based conferencing systems were used from the start in the learning applications described here.

An important part of the context is the changing level of knowledge and expectation of technology among students, and the later papers include some discussion of the resultant challenges in developing information literacy among students. Increasingly now the term *digital literacy* is being used to signify fluency and facility in using electronic resources (Lanham, 1995).

Part of the context for this narrative is an emerging set of ideas about the nature of research, and particularly information systems research. The relationship between the papers and developments in *teaching and learning* in higher education is clear through the different exercises discussed. Trent Engineering was introduced as a response to the availability of e-mail for students, and it was revised as a response to the availability of the web and the importance of the web in building a critical mass of use of the Internet. The recent work on information literacy is a direct response to changes in the nature and expectation of students. In fact it opens up a new direction for this research, about what needs to be taught in connection with information technology to higher education students, though it builds on the issue, recognised in the earlier papers, that learning experiences using ICT need to be 'right for their time' – they need to be appropriate for the maturity of the technology at the time that it is used.

A subsidiary narrative – subsidiary in that it is less prominent within this work, not in that it is any less important in global terms – concerns developments in relevant fields of *research* and is explored in two of the constituent papers in particular. One is the paper on information literacy and action research (ActionRes03), which locates the teaching experience in a process of improvement through action research. An observation is that much of the work described in the other papers does possess one important property of action research, in that the participants in the learning process also form part of the research process. The other is the paper presented at SOTL 2002 (ResLinking02) which explicitly discusses the research approaches that contribute to the scholarship of teaching and learning. In terms of the complete narrative, these two papers can be read as

interludes which ground the other material, in terms of ideas about approaches to research.

3. A critical review of relevant literature

3.1 *Purpose*

This chapter sets out to review key literature that has an impact on the material covered by the constituent papers. In terms of the aim of this complete paper, which is to construct an argument for a PhD, this chapter demonstrates that the work embodied in the constituent papers is effectively grounded in this literature. It also offers an opportunity to review this literature in more depth than has been done in the constituent papers.

A further, reflective, purpose of this chapter is to discuss areas of background which can add context to the constituent papers, but are not discussed there in depth. For instance considerations of learning style arise both elsewhere in this integrating paper and in the constituent papers, and this chapter offers an opportunity to review the literature on learning styles in more depth.

This chapter does *not* aim to be a comprehensive review of the literature surrounding management learning and new technology.

3.2 *Scope*

Management and education are two of the most diffuse subjects in the academic canon. Both can be categorised as social sciences, but both draw very heavily on a wide range of other fields. Education draws on psychology, sociology, and philosophy. But in the context of the lecture method, that remains the cornerstone of much higher education, it is not too fanciful to see education as theatre. In the context of channels that depend on new technology – and these channels are very widely discussed at present – there is a raft of literature about the introduction, and use of new technology that has an impact on the development of education (eg Collis and Moonen, 2001; Tiffin and Rajasingham, 1995; Sproull and Kiesler, 1991). Because education includes the transmission, usually verbally, of learning and knowledge, it

touches on linguistics, and on a range of disciplines, such as literature, which examine the use of words and text. Inevitably, any study of education is also contingent on the subject or discipline that is being taught.

Management is similarly broadly-based, and several disciplines, such as systems theory and, again, linguistics, have something to say about both management and education. In fact it is possible to identify overlaps between these contingent disciplines, and to identify patterns that emerge from a reading both of the contingent subjects and of the literature of management and education. Some of the themes examined in this chapter, notably the relevance of reflective practice as defined by Schön (1991), occur in both management and education, and Schön (1977) specifically links requirements for education to the rôle of the reflective practitioner.

Additionally there is now a significant body of literature on learning organisations, which very clearly embraces both areas. The study of Cybernetics, which has become a well-established discipline since the word was first used by Norbert Wiener (1989) can again be brought to bear on both (Ashby, 1956; Pask, 1975). While to some observers the word 'cybernetics' has a ring of the 1960s or 1970s to it, there is a contemporary echo in the use of 'cyber' as a prefix for things connected with the Internet – 'cybercafé', for example, or even 'cyberfriends' for people who have made contact using the Internet. Espejo et al (1996) apply cybernetics to the theme of organisational transformation, and explicitly dissociate their work from management 'faddism' by demonstrating how their analysis is grounded in established concepts, notably the viable system model which originated with Stafford Beer (1974).

To the extent that this chapter focuses on one area or type of experience, it is most relevant to students, within higher education, who have some working experience and who perhaps want to reflect on this experience as part of their studies. Relating this to the constituent papers, the nature of the MBA cohort is discussed, for example, in GroupWork94 and ActionRes03. Even where the constituent papers refer to undergraduate learning (eg Virtual00) they apply to an environment with a significant proportion of post-experience students, and, given that Virtual00 describes

a module taught to final year undergraduate students, a proportion who spent a year's placement in business, between their second and final years of study.

Although only briefly discussed in the constituent papers (notably TechTeach97) this review includes material relevant to in-service or executive education: the extent to which the same Business Schools often provide both postgraduate degree courses and executive education is evidence that the two have a lot in common. (Collis, 2003)

3.3 *Concepts and Beliefs*

These formal and connected underlying ideas mirror the concepts discussed in earlier chapters, but are phrased here as *beliefs* about the nature of the subject, and particularly inform the constituent papers:

- New technology offers many possibilities to enhance the ways that managers learn. These possibilities depend on harnessing properties of this new technology that are not shared by more established media. The growth in distance education enabled by new technology is a particularly dramatic and widely publicised example of this, but there are many other possibilities for the incorporation of new technology into learning
- There is scope for new technology to be introduced as an adjunct to existing technology – for information and communication technology to be used to support existing ways of delivering courses – and some of the greatest benefits can accrue where one medium directly supports another. New delivery and communication channels often supplement, rather than supplant, existing channels. Two familiar contemporary examples of new channels supplementing existing ones are the adoption of multi-channel strategies by banks, who encourage telephone and Internet banking while retaining their branch networks, and the growth in cinema audiences since the 1980s, despite the ever-increasing availability of videotapes, DVDs, and so on
- Zuboff (1988) was among the first to identify ways in which the use of technology was embedded in how organisations work. Her work was focused on businesses

but can be applied to other organisations such as educational institutions. Reading her conclusions now, many of them seem obvious, or simply part of accepted wisdom about the way that businesses should operate. This transition, from Zuboff's ideas being radical when they were first aired, to their being part of the accepted nature of organisations, is a characteristic of the years since 1988 and has changed completely the perception of new technology in many areas of life. New technology here encompasses communication technologies such as mobile phones as well as computer technologies

- The increase in the extent to which information and communication technologies are embedded in our life and work has been accompanied by a number of very broad social and political shift, notably the trend towards globalisation both in society and in business. While it is difficult – and well beyond the scope of this research – to establish any causal link there can be no doubt that information and communication technology is seen as an essential part of any vision of a future economy. For example Coyle (1999) sees the 'weightless economy' as a result of a whole raft of social and technical innovations, some of which are directly related to information technology.
- Students approach management learning with a diverse set of expectations, and with very different attitudes and approaches to learning. What may work well for one learner may be a very poor approach for another. There are no universal approaches to teaching and learning which suit every incidence of management learning. However there is much scope for identifying learning styles (or at least learning strategies), and classifying learners according to their favoured approaches, their motivation, and their desired outcome. Such classifications help to identify where new technology can best be applied. But they also underline the idea of 'multiple realities' – that something will look different, and needs to be evaluated differently, from different viewpoints. Incidentally this is not purely a matter of individual differences in viewpoint. Groups of learners also have their own very distinct dynamics, and motivations and 'personalities'.

These underlying beliefs will be revisited later in the light of the literature surveyed within this chapter.

Much of the material discussed here can be categorised as ‘classic’ literature in that it predates the current interest in new approaches to learning. There is an important issue implicit here, that new approaches to teaching and learning may exploit new technology, but to be effective they need to exploit ideas that have been recognised for decades.

3.4 *Linking learning, technology, style, and reflection*

The original motivation for writing about an ‘urban environment’ was to exclude the distance education field, which has been extensively researched elsewhere, and possibly to consider how some of the concepts of distance learning could be adapted for other settings.

However one avenue within the CMC/CSCW literature and some related areas does lead fairly rapidly into a discussion of urban theories. For as long as computer communication has been available, there has been a body of thought that computers would make face-to-face contact redundant. Pask and Curran (1982) wrote *Microman* at about the time that personal computers were first becoming widely available – in fact the name reflects the association, popular at the time, and as prophetic as it transpired, between the microprocessor and the future. Their predictions for 2002, while accurate in some ways, now look rather quaint. In particular they suggest that the people of 2002 would rarely need to leave their homes because communication to the home would be so effective.

Pask (1976) has some important and succinct points to make about style and these are supported by his own experiments. He sees the holist/serialist distinction as being about *strategies* which he explicitly contrasts with ‘the more generally exhibited learning style’. He finds that competence in using a strategy does not necessarily go with any inclination to adopt it – and this can work both ways, so students might be very attracted by a particular strategy but might lack the tools and understanding to use it effectively. The point about disposition is used to introduce another distinction,

between *comprehension learners* who act like holists and *operation learners* who act like serialists. On reflection, the learning described in the constituent papers has a distinct bias towards favouring holists, and a challenge for the author in the future is to offer learning that works well for serialists.

Do Pask's ideas still carry relevance? For all the superficial quaintness of some of Pask's predictions around that time, he foresaw accurately the importance that the personal computer would have in our lives, and had some conception of its scope to transform working patterns. His experiments were based in a conversational model of learning – again much closer to the sort of thing that happens now in a chat room or other virtual environment than the crude computer-based-training approaches envisaged by most of his contemporaries. And the cybernetic and systems approaches that he adopted have come into the mainstream of management thinking, with the acceptance that a holistic view and the concept of business process are important, just as much as the ideas of Schön (1991) and Polanyi (1967) have informed contemporary thinking about knowledge. So there is every reason for this categorisation of strategies and styles still to be appropriate today.

Pask and Curran also suggested a very broad range of different sets of computer hardware and software which people would acquire depending on their interests and their profession. This prophesy came true to a certain extent, but they failed to predict the extent to which computer hardware and software would become cheap, easy to interconnect, and standardised. In practice the personal computer has become a universal tool and software is used to tailor it to individuals' needs. The corollary is that space in cities is still expensive. Pask and Curran's view of 2002 had real time agents who were as important in society as real estate agents. In practice space, in many parts of the UK at least, has become an even more precious commodity than it has been before, and of the constituent papers, 21stCSpace02 is a reminder of the continuing importance of physical space for many learning experiences. Additionally, whatever other limitations exist, Internet resources, such as chat rooms and the like are useless to anybody until they have learned to read and to use a computer, and

Barriers01 reinforces that there are still issues relating to faculty, as well as students, feeling comfortable with technology within a university.

Returning to the need for continuing face-to-face contact, the motivation to live in a community, and often one that we would recognise as a city, remains a strong one. This, incidentally has become very obvious to the author as the parent to toddlers: there is no sensible virtual equivalent to the walk to the playground, or face-to-face contact with other children in a nursery, which are clearly valued by the author's children. Nevertheless, national policy today in the use of e-learning does extend to the pre-school level (DfES, 2003)

Lewis Mumford (1966) gives some indications of why communities are so important, as he identifies such basic factors as sanitation as enablers which mean that people can live and work in communities. Cities bring with them such concepts as the citadel and the *agora*, or open meeting-space, and also a tendency towards snobbery among city-dwellers. The snobbery surrounding ancient Rome as a centre was similar to that now surrounding London or Paris: a prosperous, social-climbing Roman might evacuate the city for a country villa when the occasion demanded, but would no more go to a provincial town than (Mumford's analogy) a Londoner would decamp to Harlow or Crawley. Mumford also identifies the high-rise city as an inefficient use of space, given the amount of circulation space that is necessary around each skyscraper: a reminder that radically new approaches to organising physical space can disrupt patterns, that have evolved over time for very sound reasons, and not necessarily yield any benefits.

But cities are also about agglomerations of trades and skills. Lynch and Carr (1990) describe an urban region as 'an immense storehouse of information' – the question remains of how this can be extended to a distributed storehouse. Practical examples of information and competences being concentrated in one physical area have been observed by the author in London, with cases such as the concentration of fabric stores around Goldhawk Road near Shepherd's Bush.

It is telling that one of the most significant works analysing the social impact of the Internet is by Castells (2000), who in turn was one of the originators of the term *technopole* (Castells and Hall, 1994) to describe an agglomeration of technologically-focused organisations operating in a localised area. Just as Goldhawk Road is the centre of an agglomeration of fabric stores, Sophia-Antipolis in the south of France, and Cambridge in Britain, have made claims to be agglomerations within which technological innovation are fomented.

Castells and Hall are scathing about Sophia-Antipolis (despite its incontrovertible success in attracting a community of workers based around technology, the gap between academia and industry is not bridged here, and it is not as favourable a site for innovation as might be hoped). Conversely, they are complimentary about the growth of high technology firms around Cambridge from the 1970s, partly because of the pivotal rôle played by the university here. They observe that the region around Cambridge looked like a rural backwater until the 1960s: while true, the university has a strong and long-established scientific and mathematical tradition, so perhaps provided a less unexpected setting for innovation than Castells and Hall might have thought. In fact Pye is mentioned as a spin-off from the Cavendish laboratory as early as 1896, as are the precursors of Fisons in the 1930s. Nevertheless, planning regulations, from 1950 to 1967, actively discouraged new industry from locating around Cambridge lest it disturbed the city's historic character, and the development of the science park was a conscious move away from this policy.

Returning to his account of the *network society*, Castells (2000: 27) sets himself ambitious targets of understanding the 'multicultural, interdependent world' that we now inhabit. His prologue sets the context of the end of the twentieth century as an era of rapid change – not just the rise of the Internet and the relentless march of better and faster computing, but the end of the cold war, globalisation, changes in the composition of the workforce, environmental awareness, and the growth of single-issue political movements among many other issues. His conclusions reinforce the complexity of the information society and the extent to which we can no longer rely on established certainties. His final, cautionary, phrase entreats us to look at ourselves – perhaps to

become more reflective – in the light of the demands of the new economy and society and to be prepared to be disturbed by what we see.

Castells draws close analogies between the communities that have arisen on the Internet, and those that exist in cities, partly because much of his analysis of cities stems from the concept of *space of flows*. Typically these are information flows, and indeed the business districts of cities are described as ‘information-based, value-production, complexes’ (Castells, 2000: 145) – a concept of course that fits very well with the emergence of an increasingly information-based economy. In analysing the flow of information between cities, which could be defined by such practical measures as the number of parcels being sent from one to another, he identifies emerging trends, such as the increasing prominence through the 1980s and 1990s of such medium-sized American cities as Phoenix and Atlanta. Elsewhere, Castells observes that the world’s population is still becoming increasingly urban (Stusser, 2002), evidence for the continuing relevance of institutions such as City University with an urban base.

Castells’ work, then, does cement the link between physical and virtual communities, and between physical and virtual space, that forms an important part of the background for the PhD submission. Within the constituent papers, the creation of a virtual learning community (and one which fits well with Castells’ concepts in that it is defined by its information flows) is central to Community97. The increasing importance of virtual communities and the parallels with physical communities provide the context, and the impetus for innovation, in Virtual00. The continuing importance of physical space, and the way that different types of physical space support different ways of sharing information and knowledge, are discussed in 21stCSpace02.

Another, slightly surprising, connection between management learning and the urban environment comes from the work of Donald Schön (1991), whose ideas on reflection inform the move to a less didactic approach to management learning than

that practised hitherto in most business schools. These ideas run through the constituent papers and are discussed further in the next section.

Many of Schön's examples come from architecture and design (Schön, 1986), and he worked alongside Christopher Alexander, an architect and planner who is interested in how urban communities are built and spread. Alexander et al (1977) developed a 'pattern language' as a tool to analyse the development of urban areas. This is a tool to foster the creation of imaginative urban spaces that fits their residents' needs well: Alexander starts by observing two contrasting systems – the American suburban view of lots of detached houses and the typical European post-war council estate – and explaining how these both produce excessively standardised homes. One way to identify relevance, is to draw an analogy between the organic growth of physical space favoured by Alexander, and the possible organic growth of a virtual space for learning, represented by the variety of experiences covered by the constituent papers.

3.5 *Reflection, knowledge and learning*

Alavi and Liedner (2001) discuss a number of different perspectives and definitions of knowledge, notably how it is distinct from data or information, whether it can be regarded as an object to be manipulated, and relate these definitions to alternative requirements for knowledge management within organisations. Their central definition is of 'a justified belief that increases an entity's capacity for effective action'. They also discuss a number of taxonomies of knowledge, but highlight one, which is perhaps most characteristic of knowledge, which is the existence of distinct tacit and explicit dimensions. The idea of tacit knowledge originated, long before it became part of popular business currency, with Polanyi (1967) who summed it up with the aphorism 'we know more than we can say'.

Knowledge management has emerged as a major issue for business within the period covered by the constituent papers. Nonaka and Takeuchi (1995) discuss the importance of converting knowledge between tacit and explicit, and recommend that

this is done through a process of socialisation that has close echoes in the reflective processes recommended by Schön.

Bruner (1996) also favours the definition of knowledge as a justified belief, but here applies it to the world of education. His principal interest is in children's learning; here he argues that it is not sufficient merely to explore and explain what children do, but it is necessary to understand what they think they are doing and why they are doing it. A similar level of understanding is desirable for those working with adult learners.

The work of Lev Vygotsky, while based around study of children's learning, has had some influence in higher education (Van der Veer and Valsiner, 1991). Vygotsky identified the concept of the *zone of proximal development*, a term used to describe the zone within which a student could usefully add to their skills or knowledge. For instance, he suggested, a competent player of chess could learn an immense amount through coaching from a grandmaster. But somebody who did not know how to play chess at all, would gain very little from a grandmaster, because they lacked the initial knowledge necessary to make sense of the newly added knowledge. In Vygotsky's terminology, the extra knowledge imparted by the grandmaster would fall within the competent player's zone of proximal development.

Applying this to higher education in particular, Vygotsky's views offer further support for the importance of context, here in terms of the learner's prior knowledge and predisposition to learning more. In the earlier papers, notably Eteaching92 and GroupWork94, some resistance is reported among students to using the Internet, which at the time was seen by some as an irrelevance to business. This could be interpreted as a mismatch between these students' zones of proximal development, and the knowledge and skills being that the learning experiences, discussed in the papers, set out to impart.

Argyris (1999) has contributed to the field of knowledge management through the application of double-loop learning, represented by the diagram below:

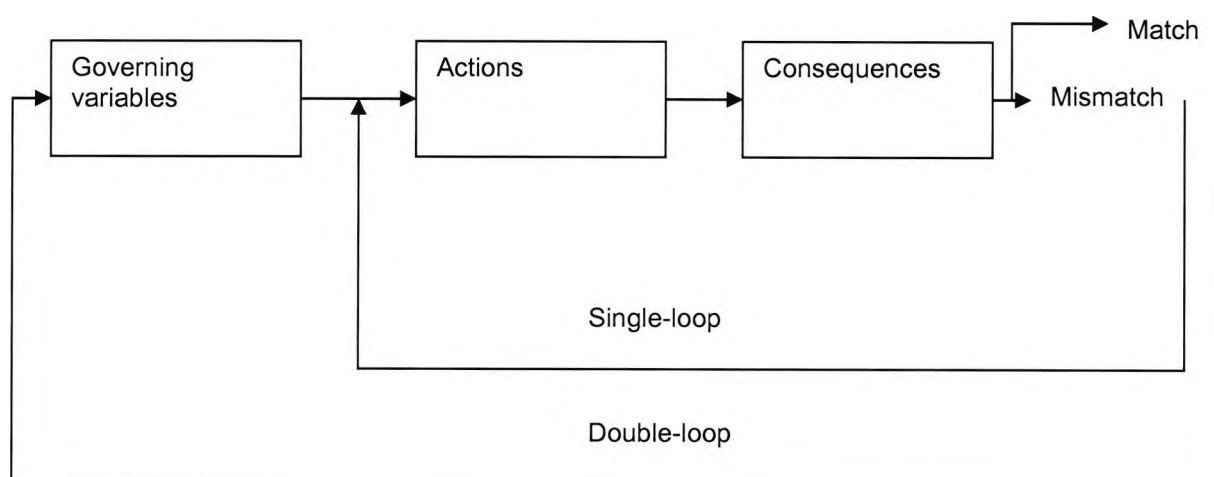


Figure 3.1 Double-loop learning

A simple way of understanding this (and an example used by Argyris) would be that a thermostat is a single-loop learner: it measures whether the temperature in a room is 'too hot' or 'too cold'. A double-loop learning thermostat would be one which tries to enquire why a thermostat is actually set to, say 19°C. Argyris observes that double-loop learning is not always the most desirable approach within a business, and is frequently inhibited by mixed agendas and confused communication.

Knowledge also underlies the way in which organisations can respond to technical innovation. Christensen (1997) writes about *disruptive technologies* which challenge existing business structures and introduce opportunities for new entrants. One reading of Christensen's analysis is that it is sometimes impossible to transfer tacit knowledge from one generation of technology to another. Within Barriers00 the focus is mostly on practical issues which prevent exploitation of new technologies in learning, but these reflect the challenges of introducing disruptive technologies into an educational environment.

Ackoff (1989) saw knowledge as one of three intermediate stages between data and wisdom (the spur for his interest in wisdom being that he had been invited to give a presidential address to the International Systems Science Society): his transition is

from data, to information, to knowledge, to understanding, to wisdom. He suggested that, among other properties, wisdom should have permanence, whereas information by its nature was transient and knowledge had only a slightly longer life than information. Bellinger (1997) draws this hierarchy in terms of four stages (data, information, knowledge, and wisdom) and modifies Ackoff's analysis by placing understanding as one of the axes of his diagram, not as a stage between knowledge and wisdom. Bellinger also invokes the concept of *flow* (Csikszentmihalyi, 2002) in explaining the transition from one level to another of within this hierarchy.

Beyond the stable state (Schön, 1971) reinforces Schön's connection to the world of business and management, and also the idea that the concepts underlying reflection-in-action form a response to a move away from a predictable, deterministic, business world. That is the same trend to which the work described in the constituent papers has sought to respond. But a further theme is the urgency – admittedly stated as far back as 1971 – of adapting to a world where the shape of business and society is no longer static, and where individual or corporate aspirations cannot be stated in terms of the search for a cosy, predictable, life.

Lave and Wenger (1992) identified the concept of *situated learning*, that is, learning within a given social situation. Their template for this is a familiar one of an apprenticeship, and they studied five diverse examples, including midwives in Mexico and non-drinking alcoholics within Alcoholics Anonymous. Their work is subtitled 'legitimate peripheral participation', and they discuss cases where participation in an activity, possibly as a newcomer to a particular social world, is central to a learning process. A striking example is that of participants in Alcoholics Anonymous, for whom telling a story is an important part of their activity. They are not explicitly taught to tell stories, but they learn it through exposure to experienced members of the community.

Arising from this is the concept of *communities of practice*, defined as 'a set of relations among persons, activity, and world, over time and in relation with other tangential and overlapping communities of practice' (Lave and Wenger, 1992: 98) and subsequently

explored in greater depth by Wenger (1998). This review cannot really reflect the depth of Wenger's analysis, but there are some significant relevant points. Wenger suggests that a number of communities of practice can be related to form a *constellation* of practice – the term constellation was chosen because it represents 'a particular way of seeing them as related, one that depends on the perspective one adopts' (Wenger, 1998: 127). Not only is there an emphasis on building communities in the constituent papers, but the collaboration between different universities highlighted in Groupwork94 can be interpreted as building a shared understanding across a constellation of practice. The concept of communities of practice is embraced enthusiastically by Brown and Duguid (2000), who see the implicit orientation within the approach, towards achieving a practical result, as an important contribution to meeting the challenge of taming information and ensuring its usefulness.

Furthermore the model of learning information literacy adopted in InfoLiteracy03 and ActionRes03 fits closely with Lave and Wenger's concepts. In this case the cohort of MBA students becomes a community of practice, where some members are extremely experienced and confident in navigating information, while others are able to learn by picking up ideas from their experienced colleagues. Placing the information literacy material at the start of the MBA programme reinforces the community of practice view, because the learning about information literacy was simultaneous with the process of learning to work as a cohesive group of students.

Feldman (2000) takes the related concept of interpretive communities (Olson, 1994) further – writing for example of the set of people who might enjoy, and understand the rules of, a particular genre of writing, as an interpretive community, and discussing how they may share these rules and norms: she observes 'the essential sociability of language'. Some of this can be seen in the emergence – referred to in the constituent papers – of dialogues between students with shared interests and shared insights, notably in GroupWork94 and Community97.

Another pioneer of innovative approaches to learning, in an industrial setting, was Revans (1998), working in the superficially inauspicious environment of the National

Coal Board shortly after nationalisation in the 1940s. He introduced the concept of *action learning*, still best documented in his *ABC of Action Learning*, though the editor of the most recent edition has shortened some sentences and tempered what he describes as 'Revans' magnificent oratorical style'.

The starting point is a simple equation which summarises the link between different types of knowledge:

$$L = P + Q$$

where P represents programmed knowledge and Q represents questioning insight – P is handled by traditional training and development ideas and Q is handled by the Revans' idea of action learning

Six stages are suggested as parts of the journey through an action learning programme:

Analysis → Development → Procurement → Construction or assembly →
Application → Review

There are also 20 characteristics of action learning – so, much as the principles are now widely recognised, Revans is promoting one very specific approach and is prescriptive about how to make it work. He is also blunt about what action learning is not: it is not merely the application of case studies (of which he is quite disdainful), or job rotation, or 'sitting next to Nellie' (because Nellie could well be concentrating on P and not Q), or group dynamics, or as he complains of being told in meetings, just common sense.

Revans' viewpoint remains relevant, and is a further reminder that the ideas behind knowledge management are not new. Moreover the emphasis on group work, the balance of formal learning (P in Revans' equation) with reflective work (Q in Revans' equation), and the way in which group members collaborated to formulate an action plan, meant that in many ways the groups of MBA students participating in Trent

Engineering and associated case studies could be regarded as action learning sets (GroupWork94).

3.6 *Discussion on reflection: is it a suitable framework?*

Contu et al (2003) criticise the belief that organisational learning, with its associations with reflection and knowledge, is a universal virtue. They maintain, with some reason, that the 'learning organisation' has become a fashion, and that it is frequently imposed on a business, without any thought being given to whether a learning approach is appropriate in a given context. They also observe, with disapproval, that favouring organisational learning has become a 'political' position for many, and connect this with the extent that the discourse of the learning organisation has spilled beyond the world of business, for instance towards London and Tokyo becoming 'learning cities'. This last point could be read as a comment more about politics becoming managerial than about management becoming political.

Additionally they question whether Argyris' (1999) double-loop learning does in fact foster creativity, pointing out that in practice it is usually geared to a predetermined outcome. In fact, as noted above, Argyris himself acknowledges that double-loop learning is not universally applicable, especially in business.

Their reasoning is a valid and necessary caution against any automatic assumption that a programme of learning will always bring benefits to a business. However the cases reported in the knowledge management literature (eg Davenport and Prusak, 2000) do demonstrate that extending knowledge within an organisation can be valuable, given suitable conditions, and they demonstrate that scope exists for novel applications of learning in a business.

Furthermore, the knowledge management movement is a direct response to the availability of technology capable of handling large volumes of knowledge – it is noteworthy that much is written about knowledge management within the information systems domain – and this is a trend that is not about to be reversed. Pick and Schell

(2002) set out to counter the argument that 'knowledge management is more about organisational behaviour than information technology' and they highlight the scope for technical solutions, notably extensible markup language (XML) to facilitate knowledge management. Cross and Baird (2000: 71) observe that 'distributed technology such as Lotus Notes or intranets, is at the heart of knowledge management efforts', and proceed to emphasise the need to build organisational structures that allow this technology to be exploited. Hendricks (2001) emphasises the importance of seeing knowledge management as more than simply an application of information technology, but also offers a further reminder of the subject's roots in technology.

The literature on *weightless economics* (Coyle, 1999; Quah, 2000) is also a very direct response to technological progress, particularly to the increased ease of transporting knowledge afforded by innovations in communication technology.

Boisot (1998) is very explicit about the rôle of technology as a driver for the increasing use of knowledge in organisations. He writes of the *I-space*, for information space, which deals with three dimensions: codified/uncodified, concrete/abstract, and undiffused/diffused, which are represented as dimensions along the side of a cube. Boisot represents a 'social learning cycle' (rather akin to Nonaka and Takeuchi's (1995) cycle of transformation between tacit and explicit knowledge) as a bone shape at an angle within the space. The cycle runs scanning → problem-solving → abstraction → diffusion → absorption → impacting. Information technology, in Boisot's terms, allows this cycle to take place faster than before. His analysis, which also values the use of narrative approaches to encourage the sharing of tacit knowledge within organisations, stems from the study of complexity, and the spaces which he describes within an organisation are notable for the extent to which he recognises the amount of abstract, diffuse, knowledge in them.

While Boisot's social learning cycle has always been present in some form, new technology accelerates the cycle and also affords much more comprehensive access to knowledge, for workers within organisations, than has been the case before.

Returning to the constituent papers, the effects of this accelerated cycle can be seen in those papers concerned with responses to changes in the learning environment, notably WebLessons99, Barriers01, and ActionRes03.

A similar criticism, to that articulated by Contu et al, can be levelled at the over-use of Schön's ideas in the world of higher education, and there is a direct relationship to the learning organisation: for example Espejo et al (1996: 236) write about 'the emerging paradigm of the "learning organisation" initiated by Argyris and Schön and further developed by Senge'. So this criticism deserves to be addressed in relation to the constituent papers. Why choose Schön's work to inform the analysis, beyond its popularity as a basis for models of teaching and learning?

A key answer is in the nature of management, and of the types of work which Schön himself discussed. He writes about the difficulty in identifying exactly what activities are performed by 'knowledge workers' (though he does not explicitly use the term – he is talking about something different from the traditional defined professions such as law or medicine or even teaching or accountancy). He looks at a number of people's work but particularly at design – along with architecture and town planning – at management, and at psychotherapy and he logs 'reflective conversations' by people in these jobs.

So management, with its emphasis on sharing knowledge, is clearly a subject where reflective practice can offer particular value. Furthermore, the areas of management practice where MBA graduates have been perceived by employers as deficient, have included the type of skills associated with collaborative work and sharing ideas. This deficiency is referred to in passing in Eteaching92, and the aim of fostering effective team-working skills is made explicit in GroupWork94, Community97, and WebLessons99.

Schön's view about professionals' place in society can be summarised briefly, because the position of the reflective professional is quite simple – much as the supporting arguments are fairly involved. The reflective professional is more of a collaborator

than a sole operator. Instead of a remote expert, there is a reflector who works alongside their 'clients'. The example of Wilson, cited by Schön for work on malnutrition with children in Colombia is most pertinent here: Wilson had applied systems principles to the problem, but found that the central problem of resolving a 'nutrient gap' remained intractable.

In practice he found it impossible to build a model complex enough to do justice to the system. He also had the opportunity to survey the children in a small village.. As part of this he brought a display of laboratory rats to the village to illustrate the effects of different levels of nutrition. Once in the village, he invited the students to suggest possible diets for the rats, which included some popular local foods that didn't contain any protein. At the same time the students were surveying eating habits in their own communities, but initially they failed to link the lack of protein in some of the rats' diets to the lack in their own families' diet. This example is adapted from Schön, (1991).

Significantly, Wilson and his collaborators learned more from this project than they could articulate – a direct reference back to Polanyi (1967). The students, too, learned about much more than nutrition: they also learned how to discover connections such as the relationship between diet and weight. Most significantly, Wilson's problem was re-framed because it moved on from a superficially simple one, of dealing with malnutrition, to the much more fundamental one of how to involve a community with their own future.

The contract between a learner and a professional changes in the reflective world: in the traditional environment it is a sense that 'I put myself in the professional's hands' whereas in the reflective environment becomes one of working alongside the professional to make sense of one's case, and to test out one's judgement. It is recognised, of course, that this is difficult in a bureaucratic environment and that particularly in some educational contexts the whole structure of an institution can deter reflection-in-action.

Returning to the constituent papers, there are resonances with this approach. Repeatedly, the professional (in this case, the educator) does stand alongside the learner, and running through the papers there is the sense that the educator does not necessarily know best. This is, for example, apparent in ActionRes03 where the core material is provided by the learners, and where the learners' experience and perspective provides an alternative to that offered by the educators. Also the author's rôle, as both educator and as participant observer (evident for example in WebLessons99) is consistent with this model of a reflective practitioner.

Light and Cox (2001) subtitle their book, on the challenges of learning and teaching in higher education, 'the reflective professional', and they recommend reflective practice as a response to a call for professionalism among academics. While they cite Schön, they suggest that academics need to go beyond Schön's definition of reflection-in-action. For instance they stress the importance of awareness of the context within which learning takes place, and caution their readers that responding to experience does not necessarily constitute reflective learning.

While professionalism, as discussed by Light and Cox, is indeed a topical issue, it is debatable whether the rôle of an academic is in crisis, to the extent that is implied in this book. Nevertheless, the growth of the Internet is one area where rapid change has taken place in very tangible forms, and Light and Cox's analysis supports the suitability of a reflective approach in such a turbulent environment.

Sumsion (2000) draws attention to the limitations of a reflective approach, by relating contrasting accounts of two students, with apparently similar backgrounds. One became a very effective reflective practitioner; the other went through many of the motions, for example by building up a log of her learning, but still failed to include genuinely reflective observations. Again, this is a reminder that reflective practice cannot be regarded blindly as the approach of choice, in higher education, for every institution, every subject, and every student, and it is also a reminder of the difference that can occur between two students' responses to the same material – a difference that can also be interpreted as a difference in learning strategy.

Rogers (2001) draws on a range of key thinkers about reflection. His central theme is that reflection offers a lot to the world of higher education but that it is not an easy approach to implement, and there is little in the constituent papers to provoke disagreement with this.

Edwards and Bruce (2002) draw on reflective practice and action research in devising a framework within which students are encouraged to search the Internet carefully – again consistent with the experience at City that they need to forget some of their established skills and record and act on their experiences as they navigate the Internet (InfoLiteracy03). Perhaps most interesting and relevant is that ‘record keeping’ is at the centre of their model, so they encourage their students to make careful notes of the steps that they take in conducting a successful web search.

In *The Democratic Corporation* Ackoff (1994) proposes ways in which businesses, and the organisations that surround them, should change to meet the demands of a rapidly changing world. His emphasis is on established American corporations, but the drivers for change, that he identifies, exist the world over. He uses the data/information/knowledge/wisdom hierarchy to construct a critique of current business schools, which he maintains are ‘industrialised disseminators of data and information’ without the ability to encourage understanding and knowledge (Ackoff, 1994: 200). He is critical of the case studies used as teaching tools (note that there is a distinction here between case studies for teaching and case studies as a research instrument, though it is no coincidence that both are encompassed by the constituent papers) because those typically used in business school teaching are ‘exercises, not problems.’ In other words the teaching material favoured in business schools is too artificial, too contrived, to be truly relevant, and his serious analysis perhaps echoes popular unease about the relevance of management education, as expressed by Crainer and Dearlove (1998).

Ackoff also criticises a lack of holism in teaching materials, and this is a point that the constituent papers set out to address, at least to the extent of integrating material,

ostensibly about ICT or information management, into the content of a programme as a whole (GroupWork94, InfoLiteracy03) and of integrating that teaching with research (ResLinking02). The effectiveness of a holistic approach does, however, depend on learning styles, and the connection is best illustrated by Kirby's (1979) simple division into *lumpers* and *splitters*, in that splitters are likely to be disturbed by this approach because it challenges their division of a programme of study into discrete subjects or topics.

Smith (2001) identifies three areas of criticism of Schön: it should be noted that Smith's stance is generally very supportive of Schön's view and emphasises Schön's contribution to the understanding of learning. The three areas of criticism can be summarised as:

1. The tendency to reflect *after* an activity has taken place, by which time it is too late for the reflection to be of immediate use: this can be summarised in terms of the distinction between *reflection-in-action* and *reflection on action*
2. The extent to which reflection might inform practice, but does not necessarily inform *praxis* – which in Smith's analysis is distinguished by a regard for broader virtues (human well-being, truth) and also by a lack of prior judgement about the approach to be used in a particular instance
3. That Schön has produced some valuable theory but not necessarily identified the means to put it into practice, except perhaps in the very specific examples that he wrote about.

The first criticism can be addressed by looking at the extent to which, in the constituent papers, there are instances of interventions being introduced as a result of reflection and analysis (notably WebLessons99 on response to the growth of the world wide web, Virtual00 on the growth in virtual organisations, and ActionRes03 on changes in information literacy): reflection-in-action, and not just reflection on action, is clearly taking place here.

The second criticism can be addressed in terms of the connection with broader issues of policy and strategy, as identified in chapter 3: the extent to which the work goes beyond the mere implementation of a series of modules, and the extent to which it is informed by a holistic view of the educational process, is an indication of praxis.

The third criticism can be addressed by considering the purpose of Schön in the author's present research, which is to provide a common theoretical underpinning for a body of work which is largely based around practical experience. Therefore it is legitimate to debate the extent to which Schön put his ideas into practice, but even if he did not, that does not detract from his relevance to this work.

3.7 *Social science research: the context*

As stated in chapter 2, the overarching research philosophy is based around the notions of mode 2 research (Gibbons et al, 1994) and Flyvbjerg's (2001) suggestions on how social science research can be made effective.

Flyvbjerg is also enthusiastic about narrative and he uses this to great effect in one case study – where he is looking at how the citizens of Aalborg gathered together to improve their town. Incidentally this is another link between reflection and urban planning, as also exemplified by Schön (1991) and Alexander (1977). In particular he was looking at the citizens' responses to wanting to reduce the amount of car traffic in the centre of Aalborg – which became a battle of paradigms between the chamber of commerce, who saw increasing the number of car drivers as a way of getting more business to the city, and others who wanted to revive the central area by reducing the number of car drivers. He is scathing about the results, which he regarded as over-influenced by the chamber of commerce's narrow view of reality, and, to the question 'where are we going with democracy in Aalborg?', he regretfully has to answer 'astray' (Flyvbjerg, 2001: 148).

Flyvbjerg has been criticised, for example by Collins (2002), principally because his objection to the established models of mode 1 research can be read as a plea to carry

out completely unstructured research. Collins also suggests that Flyvbjerg is still fighting a battle that has already been won by others who share his view of the world – an assertion which may be true in sociology departments of universities but is much more contentious among those studying the social sciences as a whole. In fact Flyvbjerg is very specific about the characteristics of *phronetic* social research, even though he is not prescriptive about how these characteristics are achieved. Notably he raises four questions:

1. Where are we going?
2. Who gains, and who loses, by which mechanism of power?
3. Is it desirable?
4. What should be done?

In terms of the constituent papers, the answer to the first question is to do with the effective use of ICT in management learning. The second can be answered by consideration of the costs and benefits of introducing ICT to learning as discussed in the papers. The third is covered by critical discussions of the different approaches to learning, and a recognition that innovations were not always successful and were certainly not universally popular. The fourth is covered by the practical orientation of the constituent papers.

Related to Flyvbjerg's ideas, Dadds and Hart (2001) offer some valuable examples of how educational research can be done, and support for the validity of narrative as a tool for educational research. One of the most powerful cases here, even though it comes from a primary school, is from a teacher who consciously rejected most traditional research approaches in favour of writing a story about her experiences and those of pupils in her school. The contributors to their work are all practitioners, and are also all participants in a MEd course at Cambridge, and the snapshots are notable for the extent to which they simply describe what the different participants are doing at different times.

Hart has also written a paper entitled *Action-in-reflection* – an interesting play on Schön's words (Hart, 1995). She is writing from her experience as a support teacher and as somebody in general committed to an *interpretative* way of teaching and not a *transmission* approach to teaching, and uses lots of influences to back this approach up. Schön is important here but she also draws on writers who are more specifically concerned with the world of schools. She observes that there is a set of beliefs here: there are resonances in Alavi and Leidner's (2001) idea of knowledge as a justified belief. These beliefs in some way influence her methodology, and her approach is much less linear (from methodology to study to results) than it might be if she had been more committed to the transmission approach to teaching.

She then moves on to a series of observations of children, and reflects on how much these observations are coloured by her own ideas. A simple but telling example is the observation that one child is reluctant to write, which could also be a statement about her expectation that such children should write. Hart specifies five modes of inquiry. The one most relevant here is the *affective* mode which is the one that demonstrated most influence from Schön, and also the one that gave rise to the anecdote about Alison above.

This is the mode in which the researcher's views and feelings can have the strongest effect on the results. Again, context is everything. Her account is that 'the affective mode examines the part that feelings are playing in a situation, and in leading us to a particular interpretation. It asks 'how do I feel about this?' and 'what do these feelings tell me about what is going on here?'. It is a very particular approach to research based on the response of the gut and not of the mind. The differences between Hart's analysis of reflection and Schön's are in fact quite subtle. Schön looks on prior experience as a source of 'exemplars' which are brought to bear on a new problem, Hart's analysis is that prior experience and reflection are used to ensure that any findings can be grounded and generalised effectively. It could be argued that Hart's ideas are really a special case of Schön's, but nevertheless Hart offers a valuable link between reflective practice and educational research.

Aristotle's (2002) musings on wisdom are of particular note here because this is the origin of the term *phronesis* also favoured by Flyvbjerg (2001). Aristotle sees wisdom as holistic (to use a current term), as a practical expression of intellectual ability, and as an ability to do good by one's actions – perhaps this last is the reason that Flyvbjerg has invoked this Aristotelian term in his plea for relevance in the social sciences.

It is notable that Beer (1974) also uses the Aristotelian term *praxis* to represent the way that his ideas can be applied broadly (in practice, he is referring to government but this must be set in the context of the gigantic nationalised industries of Allende's Chile). He is scathing about existing structures, and the effect of the establishment that he disparages as the 'mediocrity machine'. He is prophetic about globalisation: even writing in 1973 he observes that 'you can sit in a London restaurant on Scandinavian chairs, using Belgian cutlery. The meat dish you are eating was made and tinned in Czechoslovakia, while the potatoes have been reconstituted from a powder sent here packed in nitrogen from the place the potatoes grew in Idaho, USA' (Beer, 1975: 32)

He continues in this vein: noticeably, what is lacking compared to an equivalent scenario from 2003 is any reference to China, apart from a plastic cruet from Hong Kong.

Relating globalisation to the constituent papers, the ability to add an international dimension to learning is identified in Eteaching92 as one source of added value and was put into practice, to considerable effect, in one of the cases described therein.

Jenkins et al (2003) discuss the connection between teaching and research in higher education, and offer the support for the view also expressed, for example, by Elton (2001) that the *scholarship of teaching and learning* is one possible route towards achieving an effective link between the two. Significantly, they write about scholarship as a broader category than research, and suggest that scholarship beyond that carried out by the 'research elite' should be recognised for its contribution to an institution.

They provide discussion of the problems of motivation of academic staff in the UK (including sheer financial pressures) and some possible indication of how linking research and teaching might connect with this. They report evidence for a link between scholarship and motivation that could point in either direction. Research can boost lecturers' motivation and can mean that lecturers acquire a gravitas and authority that is lacking if they are not research active. Conversely, research can be seen as a distraction and there can be a perception among students that lecturing is a secondary activity – manifested for instance in a lack of time available for lecturers to prepare, and perhaps in classes aimed at too high a level, or in an attitude that is intolerant of alternative viewpoints (something that connects to the underlying beliefs expressed above, and particularly to the importance of being prepared to orient and adapt material to different learning strategies). Perhaps this is a plea for more relevant research as there is a tendency for the negative effects to appear where research and teaching are both important elements of an academic's job, but are not linked. This point is explored further within ResLinking02; during the initial research for that paper the authors observed that they had been practising the scholarship of teaching and learning for some considerable time, without using that term.

Within Jenkins et al's argument is an implication that the organisation of the department, the institution, and the national or political environment, all need to be right for the connection between research and teaching to take place. There is some consideration of examples of best practice, most of them from universities (like Oxford Brookes, where Alan Jenkins is based) with a strong vocational slant.

Elton (2001)'s overarching view is that there can be a useful link between teaching and research but the idea of a universal positive link is a 'persistent myth'. He notes the frequently stated idea that teaching should take place in a research environment, but that the reverse (research should take place in a teaching environment) is rarely stated. He also introduces *scholarship*, partly in a search for a suitable English translation of the German word *wissenschaft* which could also imply *learning*. As well as discussing the nature of research and scholarship, he does write about different ways of assessing the value of good teaching – whether it be from the students' viewpoint, the staff's, or the

viewpoint of funding councils and so on. He is blunt about the link between teaching and research behind traditional, didactic, lectures and the limitations therein, and even suggests that unbounded and infectious enthusiasm for a subject, while popular with students, can be dangerous because it becomes close to a religious process, where students might feel as though they have been ‘converted’ to scholars in a particular subject.

3.8 *Learning styles and strategies*

While few of the papers discuss learning styles in any detail, the analysis in chapter 3 reinforces the importance of learning styles in ‘sensemaking’ around the constituent papers, and there are a number of explicit references to different learning approaches, for example in GroupWork94 which draws on the concepts of deep and surface learning (Ramsden, 2003). Therefore some discussion of the literature surrounding learning styles is valuable in contextualising the constituent papers.

Learning styles have already been referred to above in the analysis of Pask’s work, which is significant in that it demonstrates a long-established link between the systemic approaches to learning, which inform the constituent papers, and an interest in learning styles. Pask’s distinction into holists and serialists is closely analogous to a more vernacular American interpretation favoured by Kirby (1979) who writes about *lumpers* and *splitters*. Claxton and Murrell (1987) survey a number of other definitions of learning style, including those suggested by Honey and Mumford (1992), and the more general educational research conducted by Entwistle (1987) and suggest that many divisions into different types can be summarised into Kirby’s two categories.

Fleming (2001) has devised a taxonomy of learning modalities denoted by the acronym VARK: visual, aural, read-write, and kinesthetic. In Fleming’s terminology, ‘kinesthetic’ learning refers to ‘learning by doing’. He deliberately chooses the term ‘modalities’, and not styles, because of the simplicity of the questionnaire used to identify categories. In this analysis, many students do display multiple modalities, and therefore need to be able to adopt a range of learning strategies to suit these. A

possible criticism of VARK is that it can read as presupposing a predominantly transmissive or didactic model of learning.

Kolb's (1984) view of learning styles is complex, but it is significant that Kolb has interviewed both postgraduate students and managers in his research. He also relates learning styles to the development of personal preferences with age; for instance he suggests that once people reach the age of forty, there is an integration stage that requires some reconciliation of personal goals with educational needs. This could be read as a statement that an involving approach to learning is desirable, not only to impart knowledge but also to build the learners into rounded and confident and competent people.

Kolb (1984) takes a very wide-ranging approach, looking among other issues at the different styles of learning – left and right brained-ness (or at least the contribution of left and right to the internalising of an idea) and acknowledgement of a very wide range of different approaches to learning. One starting point is that learning is a holistic process – his working definition of learning is one where 'learning is the process whereby knowledge is created through the transformation of experience'.

Kolb uses a favoured learning style inventory (LSI), which is based on ideas of convergers and divergers (analogous to serialists and holists, or lumpers and splitters) and has its roots in the work of Jung (1989) adapted by Myers-Briggs (Myers, 1980). A useful map relates Kolb's styles to Jung's.

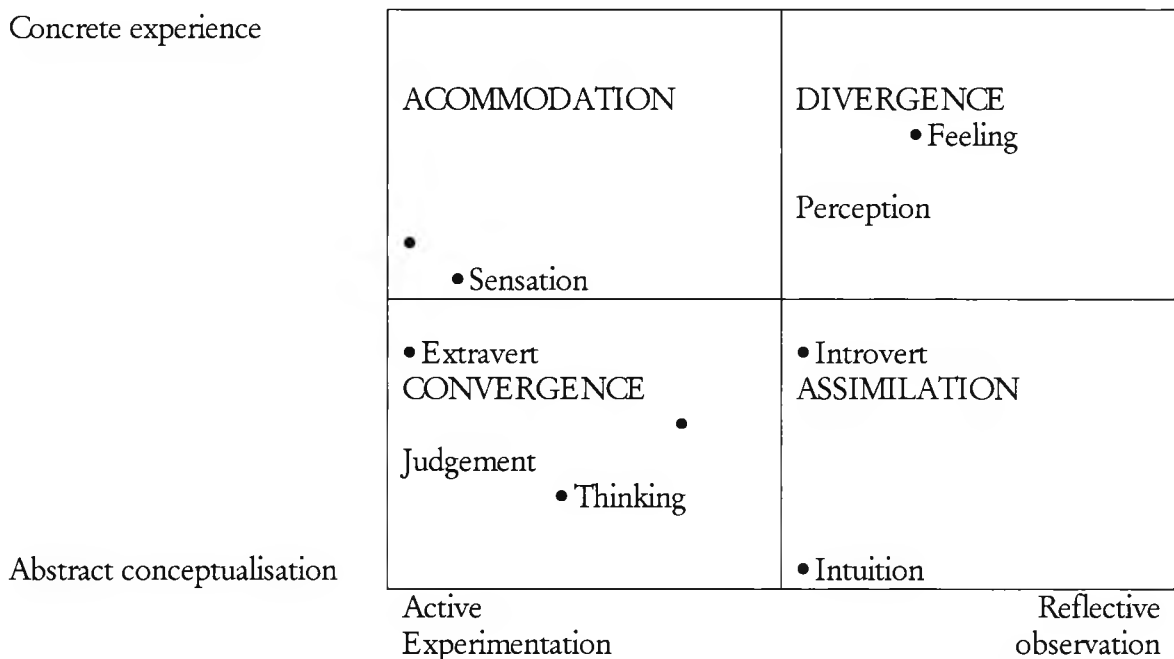


Figure 3.2 Kolb's learning styles

(Note this is a *much* simplified diagram and is based on a study of Cranfield MBAs during the 1970s, but it does help to locate Kolb's ideas).

A paradox arises in applying these to the work discussed in the constituent paper, because despite the emphasis on learning from experience, the value added by a formal business school education often takes the form of a theoretical underpinning to complement practical knowledge. One analysis of the value added by the reflective experiences discussed here, is that they support a more even balance between the top and bottom of Kolb's matrix.

Kolb applies these ideas to higher education, partly by looking at how different learning styles might suit members of different professions, partly by looking at learning as an integral part of self-development. He draws on stages of ego development identified by Loevinger (1976): impulsive → self-protective → conformist → conscientious → autonomous → integrated, and he suggests that experiential learning can lead to a breadth of interest, and a range of facets within one

person's development. It is pertinent to apply these stages to postgraduate, post-experience, students in particular as they frequently value personal and professional development higher than any formal learning.

Gregorc (1982) developed a perspective which is similar to Kolb's model. Claxton and Murrell (1987) also mention Gregorc's underlying belief which is that learning styles 'emerge from innate predispositions or proclivities and that people can learn both through concrete experience and abstraction'. His typology can be summarised in a simple 2 by 2 pattern: concrete random, concrete sequential, abstract random, abstract sequential and he suggests that most people have a preference for at least one or two out of the four. The philosophical idea of these being innate is the complete opposite of the pragmatic argument that learning styles are in fact fluid and adaptable.

However the present author's observation is that one can accept the broad categories – especially the serialist/random distinction which is a simple and useful classification – without necessarily accepting the idea of innate cause.

Unsurprisingly, concrete sequential is the dominant style for most learners, but a subtle point is implicit here, that many of these learners have a significant subsidiary style, and in many cohorts there is a significant minority with a different style – and these 'secondary' styles can have an impact on the preferred learning strategies for the group.

Baker et al (2002) draw a useful link between experiential learning, as described by Kolb (1984) and discussion of discourse and knowledge. In particular there is an examination of *streams of meaning* or different ways in which groups of people working together can interact. The different streams are worth noting here and are illustrated in the book with examples.

Stream I <i>Resonating and reflecting</i>	Stream II <i>Expressing and interacting</i>	Stream III <i>Attending and appreciating</i>	Stream IV <i>Interacting and conceptualising</i>	Stream V <i>Listening and analysing</i>
Gaining understanding of the meaning of one's own experience and/or others' experiences through resonating and reflecting in and through conversation	Gaining understanding about one's own perspectives and feelings through expressing them, and feeling and hearing others resonate and respond during the course of conversation	Gaining understanding of specific others and self through attending to and appreciating the interaction in the 'here and now' of conversation	Gaining understanding of one's own and others' perspectives and feelings through interacting in conversation with others who hold and express different perspectives	Gaining understanding of others' perspectives and feelings about the topic of conversation through listening and interpreting others' interaction in the conversation
<i>Hearing others</i>	<i>Heard by others</i>	<i>Aware of others</i>	<i>Differ with others</i>	<i>Compare with others</i>

Table 3.3 Baker's streams of meaning

It is significant that the term *resonate* is used, as it is clearly an important concept in analysis of narratives and could also be an important concept in promoting knowledge – it is easier to acquire knowledge from a discourse, if that discourse includes some resonances for the reader.

Returning to the constituent papers and applying the analysis of the streams above, streams III and IV are dominant in the learning experiences at City University.

Mann (1970) identified a number of distinct clusters:

1. Compliant

2. Anxious-dependent
3. Discouraged workers
4. Independent
5. Heroes
6. Snipers
7. Attention seekers
8. Silent students

The last cluster constituted a very large group and, at least when the original research was done on undergraduate psychology students, there were some interesting gender differences among the cohort. In particular (bear in mind that Mann's analysis took place in 1970, and the author's observation is that this gender issue does not generally apply in City University during the years since 1992) women who were silent students tended to be acting out a stereotype of the submissive woman in an academic setting, while men reported being angry and defensive as well as helpless and vulnerable.

Two important observations apply to observing Mann's categories in connection with the constituent papers. One is that the collaborative exercises served most categories of students well, but served the anxious-dependent and silent students very badly. The other is that students frequently adopted different styles in the electronic forum from their face-to-face styles, and in particular students with poor information literacy could become either anxious-dependent or silent when faced with the need to use a computer network.

Grasha (1996) takes a rational approach, which philosophically is based much more on observing behaviour than trying to explain it, either as something innate or as a response to a particular approach to teaching. There are resonances from Mann's work here, particularly in the emphasis on a dependent/independent distinction:

1. *Independent* – confident of their ability to learn and of their knowledge of what they need to learn, and in general prefer working on their own

2. *Dependent* – with little intellectual curiosity: look to the teacher for structure and learn only what is required
3. *Collaborative* – who like working with others and see the classroom as a place for interaction with others, as well as for ‘pure’ learning
4. *Competitive* – who see their motivation purely to win while seeing others lose
5. *Participant* – who want to enjoy attending class and assume responsibility within class, but do little that is not required. This incidentally is one that is very recognisable at City University, particularly among vocal groups such as the MSc programmes in the school of informatics, where students who are very articulate and have a lot to say in interactive exercises can produce relatively uninspiring written work
6. *Avoidant* – who try to avoid both class participation and learning as a whole (again the present author would observe that being quiet and detached in class is a very poor indicator of being uninterested in the subject or unable to make a contribution, and this category of Grasha’s refers to those whose non-participation spans the range of class exercises)

Grasha’s suggestion to take advantage of this, is to use different exercises and approaches which will suit these different styles, acknowledging such frequently unspoken ideas that the avoidant students will now take well to enthusiastic teachers, who by their very action challenge the students’ attempts to steer clear of any constructive learning. He emphasises that ‘no one style is bad and each is appropriate for different contexts of situations’.

Grasha is also distinctive in that he looks at both teaching style and learning style, and suggests that the two are closely coupled – given the emphasis on learning in much other literature, it must have been a brave move to write much about teaching styles. His work is a plea for understanding: he maintains that style, both of teaching and learning, is an important component of the complete process and that this is something that educators need to take into account in their work. He is strongly pragmatic, for instance recognising that teachers may come up with fine metaphors

and ambitious visions for their own work, but that there is no guarantee of these being shared by students.

This leads to a process of unpicking what makes good teachers respected and effective – which in turn touches on psychological size and psychological distance as ways to analyse the way that instructors can appear to students, and on the *emotional climate* within which teaching is taking place. One element of this is the phenomenon, identified as well by Harvey Brightman in the Master Teacher Programme attended by the author (Brightman and Bhada, 2000) of students having different typical Myers-Briggs types to faculty (Myers and Myers, 1980). In particular, faculty are more likely to be Introverted and Intuitive (IN) where students are more likely to be extraverted and sensing (ES). As an aside the author's own teaching style is clearly oriented towards perceivers rather than judgers, as it depends on an eclectic view of the material and a lot of informal problem solving. In general the learning experiences described in the constituent papers worked best when students had an expectation of this eclectic style – for instance the in Virtual00 the module discussed was an elective, usually taken by students who expected this approach and were comfortable with it.

Grasha includes some appealing vignettes about how not to enhance understanding of learning styles. For instance the disappointed committee, who brought in an expert on learning styles for a morning, but where most of the committee members failed to exploit the ideas discussed, because the facilitator had spent twenty years thinking about learning styles and the attendees were expected to develop outcomes on the basis of three hours. Another is the disloyal faculty member, who is sent on two conferences about collaborative learning, and then enrages her department head by reporting six months later that she has made no concrete changes to her teaching. (On this last, Grasha's sympathies are with the faculty member: self reflection, he observes, 'cannot be rushed').

Almost all literature on learning styles is open to debate on whether learning styles are innate, in the manner of Myers-Briggs types, or whether they can be adapted: how much can students 'learn how to learn'? For example Hudson (1966), while locating

his research in a very specific place and time, did observe major changes in learning approaches among schoolboys. This debate is largely beyond the scope of the present work, but a possible area for future study is how much students might be encouraged to adapt their learning *strategies* (more than *styles*) to take advantage of evolving learning technologies.

It is significant, in this context, that Argyris (1999) writes of the need to ‘learn how to learn’ especially for managers who he categorises as brittle personalities, and this can be mirrored in the importance, identified in the constituent papers, of building students’ group working skills. It is also noteworthy that Pask (1976) carefully chooses to refer to learning strategies because of his belief that these are not innate.

3.9 *Change in a higher education institution – the introduction of technology*

Collis and Moonen (2001) present two associated frameworks for the introduction of new technology in learning. Their empirical research covers both the higher education sector and the use of IT in learning in business, and their concepts are particularly worthy of consideration in relation to the constituent papers because of the adoption by Cass Business School of the TeleTop environment, which originates at Collis and Moonen’s home institution, the University of Twente in the Netherlands. The frameworks are for *change* in higher education and the introduction of e-learning:

Scenario 1: Back to the Basics (local setting, programme and instructional choices made by the institution)	Scenario 2: The Global Campus (flexibility in location, programme and instructional choices predominantly made by the institution)
Scenario 3: Stretching the Mould (local setting, increasing flexibility in programme and instructional choices)	Scenario 4: The New Economy (flexibility in location, increasing flexibility in programme and instructional courses)

Table 3.4 Collis and Moonen’s categories

Reflecting on this, it is striking to observe much this still assumes that change in higher education always implies the introduction of a component of distance education. Scenario 3, with its slant towards gradual change, is particularly characteristic of higher education and is certainly the closest to the experience analysed in the constituent papers.

A companion model is a 4-E model using:

- Ease of use
- Engagement
- Educational effectiveness
- Environmental factors

as different matters influencing the introduction of e-learning in a university. A simplified representation of this model is

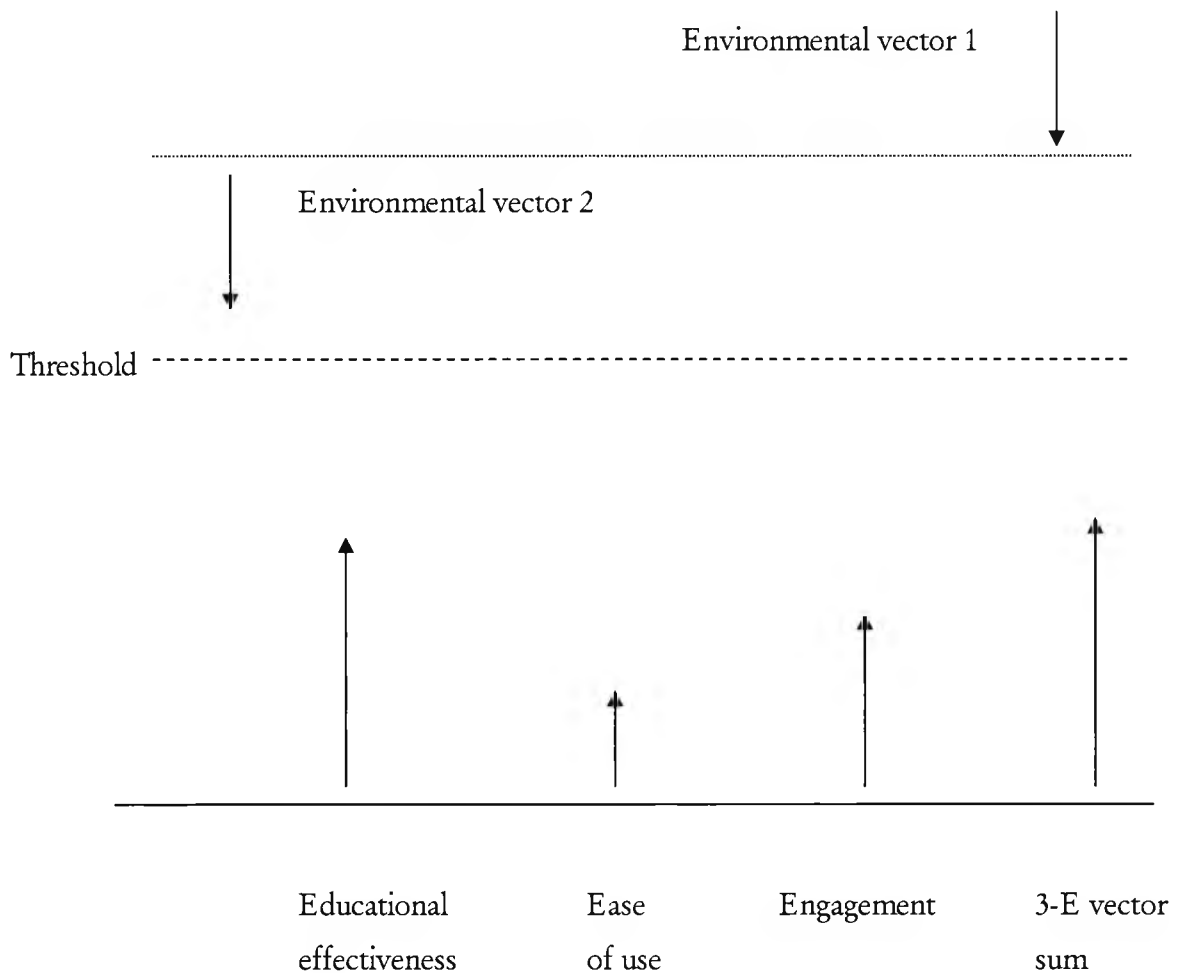


Figure 3.5 4E model (adapted from Collis and Moonen, 2001)

Note: the *environment* variable is actually the result of combining more than one vector (the illustrative diagrams such as this one show two environmental vectors, but there can be more or fewer) and this is shown at the top of the diagram because it can serve to lower the threshold. The *3-E vector sum* is the combined effect of the other variables. In Twente, as reported by Collis and Moonen, the most important institutional contribution was indeed to lower the threshold, not to raise any of the other factors. The institution decided *not* to introduce a new programme based on the technology, more to embed the technology in the courses that already existed.

A number of subfactors within the four Es are discussed:

Cluster	Key subfactors
<i>Environment</i> : the institution's profile with respect to technology use	<i>Organisational-context subfactor</i>
<i>Educational effectiveness</i> : gain from the technology use	<i>Long term pay-off subfactor</i> <i>Short term pay-off subfactor</i> <i>Learning effectiveness subfactor</i>
<i>Ease of use</i> : ease or difficulty in making use of the technology	<i>Hardware/network subfactor</i> <i>Software subfactor</i>
<i>Engagement</i> : personal engagement about technology use for learning-related purposes	<i>Self-confidence subfactor</i> <i>Pleasure with the WWW subfactor</i>

Table 3.6 Subfactors within the 4 Es

This is, it should be said, a much simplified version of the original. It is worth noting that the long and short term pay-offs mentioned under *educational effectiveness* are not purely financial: the long-term pay-off is defined as achieving long-term benefits to the institution or the individual and the short-term pay-off could include doing routine tasks more quickly.

These models are the result of synthesis of large-scale survey-based research conducted in several different countries, predominantly using qualitative approaches.

Applying this analysis to the constituent papers there is a clear emphasis on the long term payoffs and on the intention to gain intangible benefits, for example through encouraging reflection among students. While Eteacing92 does discuss 'value added', the ways in which value can be added are intangible: they may be easy to describe but are difficult to measure. Although the papers include many references to the effect of the work at the business school on broader policy issues – as discussed in chapter 3 – there are few explicit references to institutional measures which set out to lower the threshold by adjusting the environment vectors. Barriers01 is one paper which does discuss how an environment could be created, that is conducive to the use of ICT in

teaching and learning. ResLinking02 does discuss institutional issues of how research can be exploited, and linked with pedagogy, in the current climate. But with hindsight, Collis and Moonen's frameworks suggest that a greater emphasis could have been placed, during the 1990s, on working to alter the institutional environment.

Cuthell (2002) looks at the introduction of new technology, but with more of a leaning towards school learning. His analysis is scholarly, grounded in Winograd and Flores (1986) among others, and also conveys the extent to which ICT enables independent learning. He offers survey results, which convey the pervasiveness of computer ownership and use among schoolchildren and their parents, and also the range of schoolchildren's responses to the use of ICT in the classroom and elsewhere.

Cuthell is interested in how students build up understanding of IT, and especially of such concepts as multi-tasking. For instance he actually examines his subjects' use of the alt and tab keys to switch between tasks in the Windows operating system (a short cut, the use of which would indicate a level of fluency and familiarity with technology) in some detail. His experience of rapidly changing competences among schoolchildren is support for the need to create a climate where continued adaptation of the learning approaches used remains possible.

Rainbow and Sadler-Smith (2003) have carried out a survey on attitudes to using ICT in higher education (they use the term CAL, or computer aided learning, which could imply stand-alone computer training packages, which is interesting in the light of one of their conclusions) among 300 UK business and management students. Their findings are worded rather tentatively, and include a remark that younger students are more amenable to ICT-based approaches than older students: this is no surprise but a casual observation of the demographics of the Internet would suggest that this effect is likely to become much less distinct over time. However they also identify as limitations of the use of ICT, that learning using computers can *appear* a self-contained, solitary, process, and that the weaknesses in practice in applications of ICT stem from difficulties in fostering social interaction. This limitation is addressed in the constituent papers first by associating use of ICT closely with group activities

(Eteaching92, GroupWork94) and later by embedding it within a complete programme (InfoLiteracy03, ActionRes03).

Ross and Schulz (1999) surveyed a group of Canadian students both on learning styles – using the self-test approach devised by Gregorc (1982) – and on learning outcomes after using ICT. Their conclusions are also tentative except to identify that there is a clear set of students who do not gain as much value from ICT as they might.

These analyses include some discussion of how *digital literacy* can be fostered. The term appears to have entered popular use with Paul Gilster though his analysis is rather superficial, and there are earlier instances of the term being used. For example Gilster suggests that having ICT and information navigation skills is ‘becoming as essential as having a driving licence’ (Gilster, 1997: 2) – a very weak analogy as in many places, both large cities with good public transport in the developed world, and many places in the developing world, an adult can live very well without a driving licence. He remarks with awe that it is as easy to get access to web material from the South Island of New Zealand as it is from the ‘corridors of power’ in New York – hardly a surprise given that both are English-speaking countries with mature telecoms infrastructures. Bawden (2001) is rather more charitable though he does criticise Gilster for conflating ‘digital literacy’ and ‘information literacy’. Shields (1996) writes approvingly of the scope for the Internet to encourage international dialogue, but he ascribes the growth of the Internet during the 1990s to the availability of free local telephone calls in North America, apparently oblivious to the rapid growth of the Internet even in countries such as the UK where until recently all phone calls were paid for.

Lanham (1995) introduces digital literacy in a brief contribution to a wide-ranging survey by the *Scientific American* of then current issues. He links it to the notion, in vogue during the mid-1990s, of *multimedia* and the idea that an individual’s literacy should encompass skills that span several distinct media. Lanham does suggest that ‘the new digital literacy is thus profoundly democratic’ because it opens up the possibility for anybody to acquire and interpret knowledge, provided that they can synthesise the various sources from which it can be gathered.

Bruce (1997) examines information literacy in terms of a series of different competences, representing greater or lesser degrees of involvement between individuals and the information with which they are dealing. There are parallels here with deep and surface learning (Ramsden, 2003) in that the different levels distinguish between a superficial familiarity with the skills necessary to manipulate and navigate information, and a much deeper understanding of how information is structured, and of what sources are available.

These are not fundamentally new skills, but developments in ICT have brought changes in the way that these skills need to be applied. Moore's law states that the amount of computing power available for a given cost doubles every eighteen months (Moore, 1965). There is no sign of this trend abating for years to come, and the evolution in the application of ICT that informs the constituent papers can be traced directly to this availability of increasingly affordable computing resources.

It is difficult to predict the skills with which, in the coming years, universities will need to equip graduates, in the light of this relentless technical progress. Looking back over a decade, many of the predictions associated with use of the Internet already seem naïve in the light of actual events. Mitchell (1995) is characteristic of a genre that combines excessive optimism about use of the Internet, with perhaps a lack of appreciation of the importance of face-to-face, or at least verbal, interaction. Penzias (1995) suggests that the Internet is able to encourage a shift from a 'quality era' to a 'harmony era', with a much greater emphasis on collaborative work.

Penzias' vision of a 'harmony era' still looks idealistic. But there is no doubt that to encourage collaborative skills is a useful path within management learning, not least because these skills facilitate collaborative learning in other fields. Therefore there is a strong case for introducing new learning technology in a way that fosters collaboration and reflection among students.

4. Timescale and journey

4.1 *Purpose of the chapter*

This chapter reflects on the personal journey represented by the constituent papers, and also on developments during the period spanned by them.

Because of its personal nature, the first person is used in this chapter only. Within this chapter the focus is on my own activities and achievements during the period, and also on how my ideas about research have evolved, more than on the constituent papers.

The metaphor of a journey is a powerful one: as one might expect on a journey there are places which proved much more interesting than I had expected before I happened on them - Alavi and Leidner (1999) on knowledge, Alexander et al (1977) on how to apply reflective practice, come in this category in my case - places where you *need* to go through to reach your destination - Davenport and Prusak (2000) on knowledge, Sproull and Keisler (1991) on introducing new technology into learning), and perhaps places which looked promising but didn't add very much to the analysis (the post-modern view of using technology, the over-confidence which was around at the time of the dot.com boom).

The timescale is drawn below as three parallel bars, representing my progress, changes in the IT and/or education environment, and changes in the world environment, with links between them. 1988 is the starting point even though it predates any of the constituent papers, because it is when Zuboff was writing, and it predates my departure from business and the fall of the Berlin wall. Zuboff (1988) is significant because she anticipated the extent to which IT would become embedded in working life.

4.2 *Personal timescale and background*

As discussed above figure 2.1 goes back to 1988 and includes three parallel lines extending to early 2003, when I wrote the most recent of the constituent papers.

The top line represents developments in ICT, E-learning, and knowledge management over the period. The middle line represents activities within my own career. I worked in the IT sector until September 1990, then took a full-time one-year MBA from October 1990 to September 1991, before joining the staff of City University at the beginning of 1992.

My interest in the application of learning principles within an established workplace arose initially because, before working in academia, I worked in the IT business, and both the employers who I worked for have been through difficult times in terms of shareholder value since 2000. Inevitably with some background familiarity I have taken an interest in why, and particularly in how knowledge management issues relate to their failure.

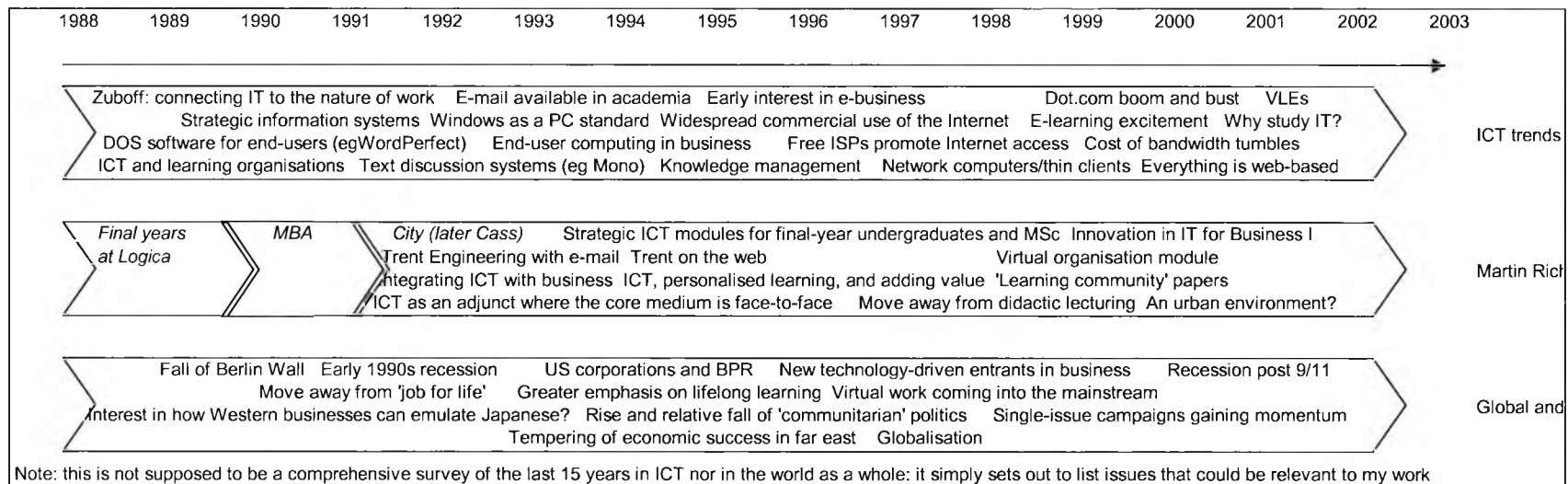


Figure 4.1 – timeline

My first employment, a long time ago now, was with GEC, now known as Marconi. It seems that while GEC in the 1970s and 1980s under Lord Weinstock was managed in a way which did not, superficially at least, encourage the sharing of knowledge, in practice GEC clearly had a lot of tacit knowledge about how to make its traditional, rigid, financial control approach work. Use of the term 'financial control' here is derived from Goold and Campbell (1987) who cite GEC as an archetypal case of management from the centre according to financial measures of a business unit's success or failure. While it is doubtful whether, even under different management, this pre-existing knowledge would have continued to be useful after Weinstock's retirement in 1997, the disastrous failure of Marconi since then could be taken as a failure to replace this knowledge with some alternative, useful, knowledge (Daniel, 2001). This failure seems to be continuing and no amount of knowledge on the part of the management seems sufficient to recover from the present slump. (Wray, 2003). Goold and Campbell (1987), incidentally, did defend GEC and other financial control companies against accusations of asset stripping, and suggest that GEC had 'saved the British electrical industry' by its acquisitions.

Most of my IT experience was with Logica, where the share price has not fallen as dramatically as that of GEC, but, writing in December 2003, it is still less than 10% of its value at its peak in 2000. Since the merger with CMG at the start of 2003 the share price has recovered slightly from its lowest value, but there have been considerable staff redundancies. Logica has always had a fairly successful business model in provision of IT services, but its profitability and its value in the City was first boosted, and is now limited, by its venture into the infrastructure for text messaging on mobile phones. The mobile networks business suffered severely, particularly when mobile commerce fell short of some of its expectations around 2001-2.

The thing that ties these two together is that both had a difficult time in moving away from an established, successful, business model. They are examples of cases where a business's strengths rapidly turn into 'rigidities' which make it hard for the business to adapt.

4.3 *Achievements at City*

I was motivated to apply for a lecturing post at City, partly by an interest in the organisational impact of IT, and partly by experience of using and implementing data communication systems, and a belief that such systems would have a wide-ranging impact in the future.

Throughout my employment at City University I have been actively involved in innovative applications of information technology to management learning. At the start of my employment this was the result of a fortunate combination of experience in data communications from my earlier career, the emergence of the Internet during the 1990s, and an interest in how knowledge is created and built upon in business.

In 1992 City University put forward an (unsuccessful) application to the University Funding Council, as it then was, for funding an 'integrated learning environment' to be known as COMMDATA. This included many features that have since become established as components in virtual learning environments. A key part of my argument for a PhD is that I and my colleagues were implementing innovative ideas during the early 1990s, notably the use of electronic resources to supplement other methods of teaching, that have since been proved valid by others.

One of the stated objectives for COMMDATA was

'to bring many of the economies of scale achievable through distance education to the more traditional form of educational institution' (City, 1992)

This gave rise to an early research question, which is how some of the ideas used in distance learning could be applied in a way that would add value to courses delivered within a university where, for whatever reason, face-to-face remained the principal medium of instruction.

It is worth reflecting that the path of this research would have been very different, had the COMMDATA project been funded.

At the end of 1992 I submitted a working paper, included in this submission as Eteaching92, outlining the broad range of applications that had been implemented at City, and including some background about the underlying philosophy. I entered this paper for a telematic-pedagogic competition based in Geneva, in early 1993, where it was awarded a *coup de Coeur*. The closest translation into English would be 'special mention of the jury' and the paper was commended both for the breadth of the applications to which it referred, and for the interest arising from an application to management education

Of the cases discussed in this early paper, one, Trent Engineering, developed over several years and forms the background for several of the constituent papers. From 1995 a web-based version of Trent was added to the original e-mail based version, both as a response to a then new application on the Internet and also in recognition that e-mail messages can be an inefficient and confusing mechanism for sharing information.

For some years I have been responsible for teaching some business-related subjects to students in City University's Department of Computing. In 1997 I was faced with the requirement to redesign one module, intended for MSc students, to be delivered as a series of five full-day face-to-face sessions. The redesigned module drew heavily on principles of encouraging reflection among the students, and to leaven the large amount of contact time resulting from the full-day format, electronic resources and discussions were used to supplement the face-to-face learning.

In 1999 I introduced a new elective module within the undergraduate programme, entitled *the Virtual Organisation* (described in more detail in Virtual00). This was a direct response to the changing rôle of ICT in business and this module has always been popular and well-received.

In 2000 I was selected to represent the Department of Management, Systems and Information, at the Master Teacher Program delivered at Georgia State University.

This is a one-week training course for faculty teaching in business schools, and the understanding is that attendees on the Master Teacher Program in turn deliver faculty development seminars when they return to their own institutions. This I did, and the feedback on the seminars at City was excellent.

For the 2003-4 academic year, I have been appointed as one of the university's teaching and learning fellows. This is a part-time secondment to the Educational Development Centre within City University, which offers scope to carry out additional research into pedagogic issues. Teaching fellows are expected to pursue particular pedagogic research projects during their appointment. My research project includes work to capture some of the tacit knowledge within the student cohort, about responses to different approaches to teaching and learning, and also to discover more about the effect of learning style on students' experience.

4.4 *Key influences*

This is a variant on Papert's (1993) concept of 'powerful ideas' – to identify people whose ideas could be cited as key influences. It is used here as an aid in structuring the influences behind my ideas. The approach is derived from Sergio Vasquez Bronfman (2001) who incidentally has been a collaborator in running some of the cases described in the constituent papers. Note that this exercise sets out to focus on people who have published influential material in relevant fields, and that these people's influence is revisited in section 7.1

- *Shoshana Zuboff* for creating the whole idea of IT being linked to the way that people work
- *Fernando Flores* with Terry Winograd for connecting linguistics with IT and creating a possible framework for analysis, and also for anchoring some of this in systems theory
- *Alan Mumford* for work on learning styles along with Peter Honey, and also for a lot of description of how management learning can take place effectively within a business. The Myers-Briggs type indicator is also an important factor: for

example Grasha (1997) bases his analysis of teaching and learning styles on this. However I claim no expert knowledge about the Myers and Briggs families, and it would be pompous and pretentious (and just plain wrong) to claim Jung, whose ideas about personality were formalised in the Myers-Briggs type indicator as an influence.

- *Donald Schön* for crystallising what is meant by reflection when people work together
- *Dorothy Leonard* for work on knowledge, really as a representative of all the thinkers about knowledge but because her practical, applied, approach fits so well with my areas of interest
- *Michael Polanyi* for identifying the tacit dimension many years ago
- *Harvey Brightman* for getting me to rethink my own teaching, for validating teaching as an important field of endeavour, and for introducing what I now recognise as Grasha's ideas of the discontinuity between teachers' and learners' favoured approaches in higher education.

Papert (1993) is also useful because he asks for powerful ideas, rather than just influential figures. The description of the core concept in section 1.2 arose from attempting to distil the research into one simple powerful idea.

4.5 *Research approaches*

This section describes the emergence of some common themes in analysis of the research.

Part of the personal journey is to set out to establish that the existing work, together with some reflection encapsulated in this integrating paper, is sufficient to stand on its own as a PhD.

One element, in synthesising the work into a PhD submission, was the realisation that the notion of reflective practice offered a unifying theme. Schön's (1991) ideas on

reflective practice, and their relevance to business and to learning, are discussed in other chapters, but the reasons for drawing on them are worth stating here:

- Reflective practice is invoked in several of the constituent papers, as a valuable part of the learning process
- The constituent papers record a search for *value added* by using ICT in learning (where the value can be intangible) and this value often takes the form of providing scope for reflection in new ways
- Many contemporary business ideas use similar approaches to those proposed by Schön, even where they are not explicitly informed by his work
- Submitting a PhD, based on a series of papers, requires analysis of the constituent papers, which is in itself a form of reflective practice

Norman (2001) provides an instance of how much business thinking has been influenced by the ideas of Schön and his collaborators; he explicitly acknowledges Schön and Argyris and uses the term 'reframing' to encourage managers to see their businesses in new ways.

The approaches used here are principally qualitative, and Selwyn (2002) argues strongly in favour of using qualitative approaches to research the use of technology in education. His focus is the UK and he spans a range of ages from primary school to adult (and draws attention to the similarities in responses between the different ages). His research is based on interview and narrative techniques, as the reference to 'telling tales' in the title alludes, and is placed in the context of a rapidly changing political and technological landscape. Interestingly, his respondents suggested that A level exams – for most UK students the stage immediately before entering university as an undergraduate – were the stage at which students were least likely to find scope for using ICT in learning.

A second element is to draw on the principles of action research: I have been both researcher and object of research (this is even true in the PhD integrating paper as it puts me in the position of reviewing my own work), and I have used the research to

inform incremental changes in my own practice as an educator. It is an approach which is compatible with (at least at some stages in my career) being in a rôle regarded as teaching-led (Forest, 2002). There is scope to take that research further in some way by moving away from the fundamental idea of being a participant-observer, for example by surveying students and particularly by using some of the existing student working groups as ready-made focus groups. However that is a step into another mode of research with a rather different emphasis.

A third element is the realisation that this work fits with the models of social science research proposed by Flyvbjerg (2001) and by Gibbons et al (1994) in their description of mode 2 research.

In Gibbons' terminology, mode 1 grows out of a disciplinary approach to research, and fits with well-established views of what constitutes 'sound scientific practice'. Mode 2 is transdisciplinary, heterogeneous, and though Gibbons does not use the term *project* or even any close synonym for it, can typically be project-based.

Transdisciplinarity has four distinct features:

- A distinct but evolving framework for problem-solving efforts
- Solutions which are a clear contribution to knowledge because they contain both empirical and theoretical components
- Participants learn about the results in stages as the research is under way
- It is dynamic – at each stage it is unclear for what the research will be used in subsequent stages

Heterogeneity implies that this research does not take place only in universities, but in much more complex webs of different institutions, each of which could in practice become very specialised. There are parallels here with the way that different businesses work together – and of course the availability of effective electronic channels for communication becomes really important here.

Accountability and reflexivity are important issues but the capstone is that in mode 1 universities exist to employ intellectual capital – in mode 2 there is a much stronger sense that they exist to build up and expand intellectual capital.

Therefore the material covered by this submission is firmly located in mode 2. At the time that I started working in the field, much of the established work on information technology in learning could be categorised as mode 1, and informed by the emergence of stand-alone personal computers and the existence of computer-based learning packages that delivered little excitement to their users. Possible future research, aimed for example at measuring the value added by ICT in learning, could draw on the mode 1 model. But in the period under review, and particularly in the light of the pace of change of the technology and of students' understanding and expectations, the emphasis has been on mode 2 research.

Gibbons in particular sees mode 1 and mode 2 in connection with a debate about the future nature and structure of universities, and believes that universities need to organise themselves and their curricula in such a way as to foster mode 2 research (Gibbons, 1996). My PhD does not seek to take sides in this debate: the references to Gibbons are simply to demonstrate that the research covered here does fit within a recognised framework.

Knight (2002) draws attention to the ideas of Sensemaking and Claimsmaking. The idea is that a researcher starts with one of these and then moves to another. So I need to establish that my work so far includes both claimsmaking and sensemaking. That is part of the methodology map (figure 2.2 below) which locates the PhD research in terms of earlier and possibly later inquiry. It sets out:

- To highlight areas of claimsmaking and sensemaking within my research
- To point out where it stands in terms of the distinction between mode 1 and mode 2 research as identified by Gibbons et al (1994).

One criticism that has been made of Gibbons and Flyvbjerg is that they do not, in practice, posit anything new, and that mode 2 research has been carried out for many years without being clearly identified as such. This criticism is recognised implicitly in ResLinking02, which acknowledges that the linking of research and teaching arising from mode 2 research is indeed nothing new. However there is a tendency to evaluate research output in ways that favour mode 1, and ResLinking02 is partly a plea to redress that balance.

Most crucial in the figure 2.2 is the reference to ‘rich experiences from doing things that are innovative’, as this is a good description of my work since joining City University.

Flyvbjerg (2001) suggests that to a researcher practising *phronesis* (his concept for applied and valuable social research, derived from an Aristotelian term for wisdom) a rich narrative might be particularly valuable even though it does not take well to scientific analysis and deconstruction, and an aim of the complete submission is to provide such a narrative.

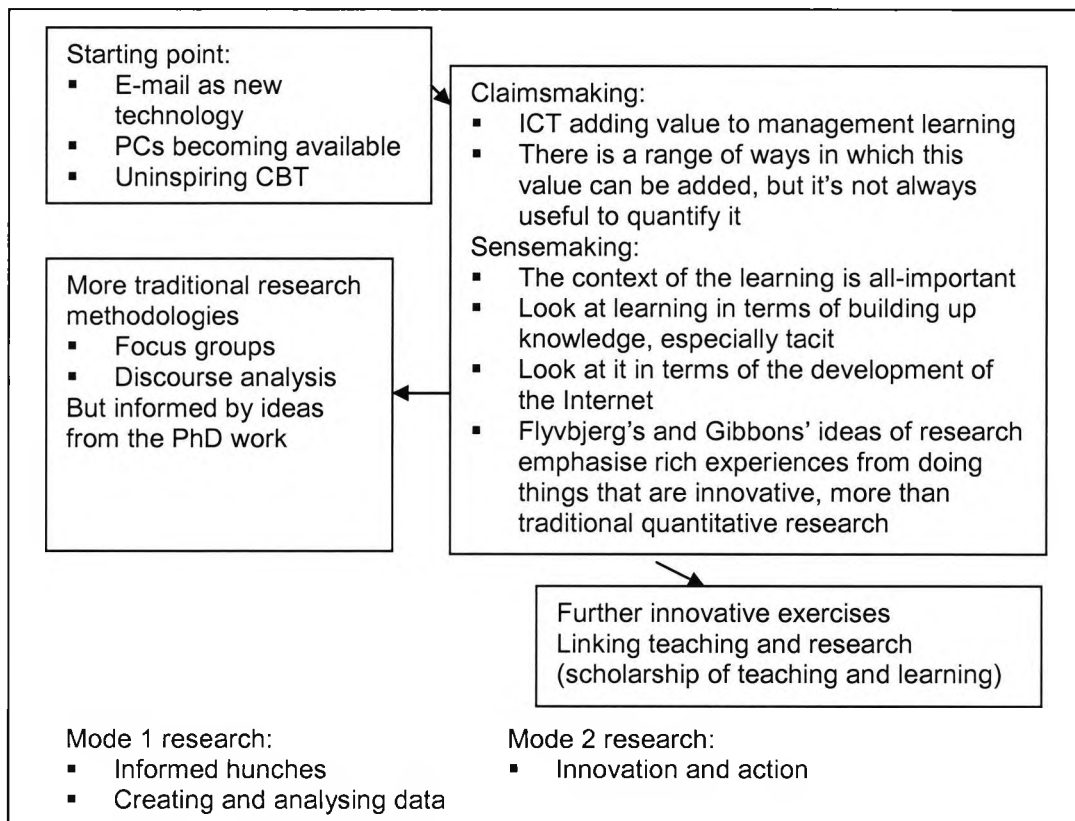


Figure 4.2 - methodology map

The list of key people above does highlight the scope, in the future, for me to carry out more empirical work. Notably Grasha (1997), and Winograd and Flores (1986), offer frameworks which could be developed into analytical tools, and in turn used to analyse some of the existing learning experiences. For example some insight could be gained by analysing current students according to Grasha's learning styles and strategies. This is indeed consistent with my current teaching fellowship project, and is one clear route that I could take should I wish to build further on this research.

5. Concept Map

5.1 *Purpose*

This chapter discusses the various domains that affect the research covered here, and describes some of the connections between them. It follows steps described, and referred to as A – E, in chapter 2 of Miles and Huberman (1994) (entitled *focusing and bounding the collection of data: the substantive start*), and these steps are used as headings for sections 5.2 – 5.6. It reviews the process of identifying research questions and issues; in terms of the argument for a PhD, it draws attention to the central research questions that run through the work and reinforces that the constituent papers represent research around one common theme.

For this PhD, there are alternative perspectives on what constitutes the original data. One perspective is that the constituent papers alone form the original data and the integrating paper becomes merely a review of the constituent papers. However, to locate the constituent papers as a focused body of work, it is appropriate to look at the data that they draw on, and also to identify focused research questions that run through the work. So an alternative perspective, which informs this chapter, is to review the totality of the constituent documents and the integrating paper, and to identify the domains of study, and the research questions, that run through the work as a whole.

5.2 *Building a conceptual framework*

This is based on an initial research idea, that was considered when the possibility of synthesising a number of existing papers into a PhD submission was first discussed. It reflects both a period of *divergent* thinking to identify a variety of different areas that could be encompassed by the PhD, and a subsequent period of *convergent* thinking during which particular research questions emerged.

The author's fundamental area for research is, and has been since 1992, how new technology can be used to enhance management learning in an environment very different from the sort of distance learning applications where most work on new technology in learning has centred. During the second half of the 1990s this was rationalised as being about management learning in 'urban environments' where an urban environment could refer to the City of London and to the importance that students attach to an urban university, such as City, having a physical presence, or to a smaller town or village with a tangible centre (GroupWork94). It could also refer to people working together in a head office which relies on a large number of people based in one place. It is interesting to observe that one widely publicised recent headquarters building in the London area, British Airways' Waterside building, is built around the metaphor of a village street and makes extensive use of new information and communication technology (ICT). (Syrett and Lammiman, 2000).

There are some interesting examples of the use of technology to assist meetings other than by allowing collaboration across constraints of time and space. Notably GroupSystems software has been used successfully at City both with students and with managers in business to conduct meetings. The advantages include the ability to contribute to a discussion electronically, the extent to which discussions are self-documenting because any contribution to an electronic discussion can be stored on disc, and the ability to 'stand-back' from a discussion and compose a contribution without fear of losing something that may be said in the meantime. (Weatherall and Nunamaker, 1995; Holsapple and Whinston, 1996) While GroupSystems is not centrally designed as an educational tool it has clear applications in management learning. Synchronous conferencing software based on the same concepts as GroupSystems has been used as a learning tool within the virtual organisation module, as referred to in Virtual00, during 2003 with some success.

Linguistics offers a good theoretical base for analysing discussions that are enabled by ICT. Winograd and Flores (1986) offer a framework for categorising contributions to an electronic discussion, and a number of tools such as the Language/ Action perspective are based on this framework. (Winograd, 1987) Winograd and Flores'

work is based on the original concept of speech acts devised by Searle (1969), but is also influenced by Flores' earlier rôle as Allende's finance minister in Chile, where he was concerned with the use of innovative meeting systems. In fact the GroupSystems software mentioned in the previous paragraph is closely based on the approaches promoted in Chile by Stafford Beer (1974), who advocated such approaches as a way of transforming work (Beer, 1975). Winograd and Flores' ideas on how a discourse could be analysed influenced the development of the Virtual Organisation module as described in VirtualOO .

A connection can be traced between linguistic analysis and tacit knowledge, in that Searle's analysis extends to looking at the tacit dimension of speech. As mentioned in the introduction, the ability to create and disseminate tacit knowledge should be an important characteristic for any management learning exercise.

5.3 *Formulating research questions*

Remenyi et al (1998) see formalising a research question as being the second out of eight phases of the research process (the first is reviewing the literature, and for this submission, that first need is satisfied in chapter 6). They emphasise that research questions 'should always be seen as contingent' so the research questions, though not the central focus of the research, have evolved and changed over time. In the context of a PhD by papers, this carries particular relevance, because it reinforces the value of revisiting papers after some time. Within mode 2 research, Gibbons et al (1994) also stress the importance of constantly changing research questions.

Salmon (1992) in her description of part-time students' experience of achieving a PhD, conveys some of the extent to which PhD students' ideas need to change during their studies. Her descriptions also convey strongly the sense of a personal journey for her students, and the extent to which each student's interests are informed by almost every aspect of their lives.

Part of the process of consolidating a body of existing work into a PhD, was to identify a set of topics, which hold particular interest in the context of the research area. Crucially, the *intersection* of these topics was seen as an area within which to focus – so while these topics may appear diverse on a first reading, there is a very focused research area where they overlap.

Four topics, with the potential to give rise to specific questions, are used in the analysis in chapter 6. These reflect the author's present thinking about the most important factors influencing educational use of ICT, and can introduce new insights into the existing work represented by the constituent papers. They are discussed below in more detail than is covered elsewhere:

- i. Learning styles: This is one of the fundamental inputs to any sort of learning process in business. When there is no geographical imperative to use ICT, learners' preferences become arguably the most important determinant of whether using ICT in learning is likely to succeed. Personal learning styles, of the sort discussed by Honey and Mumford (Honey and Mumford, 1992; Honey, 2003) can be considered as one 'input' element contributing to learners' reactions to using ICT. Other input elements would be to do with the learners' expectations and their level of familiarity and comfort with technology. It could be observed that learning styles are less likely to change with time than the other 'inputs', and particularly the typical level of familiarity with technology is something that is changing quite steadily year on year.

Grasha (1996) grounds his work on learning styles in the Myers-Briggs type indicator (Myers, 1980), where a fundamental concept is that type is innate and does not change. Grasha's starting point, that there is a discontinuity between the personality types most often found among higher education faculty, and among students, was also an underlying concept for the Master Teacher Program attended by the author in 2000 (Brightman and Bahda, 2000).

In terms of Honey and Mumford's learning styles, the author's own experience gives some pointers to how ICT might be used, in that his strongest attributes are as a pragmatist and a reflector. This translates into an enjoyment of using electronic media, along with the experience that these appear to work best when the author is in reflective mode. Notably the abilities to browse through a lot of material at leisure, and to 'lurk' in an electronic forum without feeling under pressure to contribute, are valued highly – a typical reflector's trait.

A criticism of learning styles is that they imply that individuals innately favour one style over another, which can limit their ability to adapt or to be receptive to new approaches. Arguably 'learning strategies' would be a more useful term. Hudson (1966) studied pupils in a very traditional school environment and also tried to analyse the learning approaches of historical figures such as Kepler and Darwin. In both cases his conclusions implied some caution against categorising his subjects too early as a particular type of learner.

Increasingly another factor influencing learning styles is the extent of students' information literacy (Bawden, 2001) and the work covered by InfoLiteracy03 and ActionRes03 addresses specifically how students can be encouraged and enabled to acquire these sustainable skills.

Richardson (2000) explicitly discusses learning *approaches* and *orientations* – similar to what are termed learning strategies in the paragraph above – in his discussion of how the experiences of university-based and distance students differ. He chooses the term *approach* because of his use of the *Approaches to Studying Inventory* developed at the University of Lancaster. In his analysis he generally regards distance learning as being synonymous with learning through ICT, although he does point out that this is not necessarily the case. Arguably, then, his analysis does not cover the focus of this research where ICT is an adjunct which adds value to face-to-face learning.

A simple model of the influence of different factors on management learning effectiveness, derived from reflection on the issues mentioned above, can be represented as:

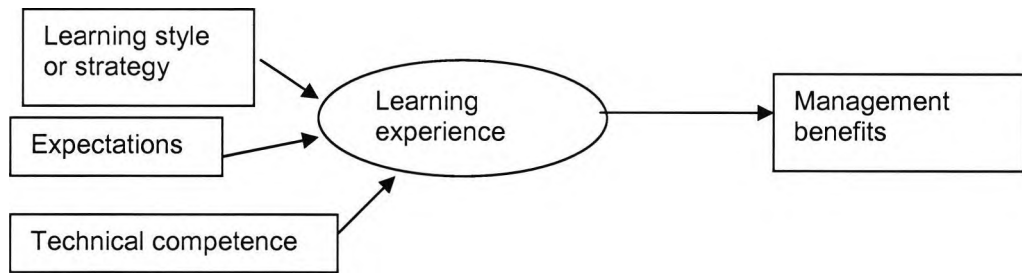


Figure 5.1 Influences on learning experience

- ii. Virtual communities: for many years the author has been fascinated by how people behave in electronic communities, and has worked in the practice and study of these. The work of Hiltz and Turoff (1993) is a reminder of how important these are in building educational use of ICT, and that this importance was recognised long before the advent of widespread use of the Internet. In the early 1990s an intriguing example was the way that people used communities such as the ‘mono’ bulletin board, which originated at City and which is still thriving, and Usenet newsgroups, which similarly remain popular and have existed since before the Internet attracted widespread personal use (Eteaching92). The characteristics of virtual communities acting in parallel with conventional communities make them potentially very valuable for learning within organisations.

It is interesting, for example, to observe people working in the suburbs of London, whose preferred way of obtaining technical help on particular issues is to contact colleagues in Chicago (Schwiller, 1999), and to ask why these patterns arise. It is interesting to observe the sorts of rôles and personae that people adopt in virtual communities, and to ask how these might be used to promote, or impede, management learning.

Virtual communities are also very important tools in the promotion of knowledge management and in the building of learning organisations. The impact of such communities on business has become a popular topic for study and one of the constituent papers (Virtual00) is about the author's response to this trend.

- iii. Applicability of ideas (particularly in established organisations): The work described here centres around introducing new technology in an established university, and thus has implications for effecting change within an organisation, and also responding to a period of rapid change in the environment (in this case rapid change in where IT fits into business, and thus its impact on business and management education). But it also has relevance for learning within business.

As long ago as 1987, Hawkrige et al (1987) acknowledged the connection between technology then in use within the Open University, and technology in use within businesses. In a survey of best practice in businesses in Europe and the US, there were flight simulators, traditional CBT packages, authoring packages, a refreshing acknowledgement that instructional designers of the time should not worry about being hamstrung by the limitations of the IBM/DOS systems then available, and a prediction of how things might be in 2000 which, despite failing to foresee the Internet or anything like it, does not on the whole read, with hindsight, as being excessively quaint. The authors did predict high-capacity networks within a company – a sort of primitive, non-standardised, Intranet, as being important tools for training.

Collis (2003) looked at what business and academic partners could learn from each other in the use of IT in learning. She found that the two groups had different understandings of the term *e-learning* and also that the two groups had different, and often complementary, strengths and weaknesses in their decision-making and change processes.

The research carried out at City, then, is firmly based in the higher education environment. But the themes and conclusions have a broader application, and the scope of the complete PhD does include discussion of how the ideas can be applied, particularly, to in-service training in businesses.

It could be argued that City University is also facing pressure to change its existing business models, and there are certainly radical changes in the expectations with which students arrive to take a full-time degree programme.

- iv. How have things changed? What issues arise from looking at each of the papers, with the benefit of knowledge of how both ICT and management education have developed since? This is particularly apposite in view of the very early engagement with the Internet reflected in these papers, but a historical perspective can always provide some insight into papers that were written a few years ago. It also reflects the theme of change. It highlights the extent to which the thinking at City University in the early 1990s was innovative, and offers insights into the way that pedagogic applications of ICT have become increasingly mature over the years.

These four areas also offer scope for framing new questions about the work that has been carried out with students at Cass. This fits well with the idea of reflective practice (Schön, 1991). The constituent papers mostly stress the application of ICT to management students and reflect on how it might or might not work. Reflective practice emphasises the need to frame questions in novel ways and these topics offer scope to frame some novel questions about the existing work.

Therefore an approach used elsewhere in this integrating paper is to use the four topics above as lenses through which to view the constituent papers. This is represented in the commentary on the constituent papers (chapter 6) as a matrix relating these papers to the issues above.

Returning to the challenge of formulating a central research question, the type of question which can be asked is:

- 'how can an organisation (whether a business or an educational institution) use ICT to improve the effectiveness of managers' learning, at a time of rapid change?'

and

- 'given this, how do we identify the characteristics which make individual managers susceptible to learning using ICT?'

These could be simplified to:

- 'how can an organisation use ICT to improve the effectiveness of managers' learning?'

Reflecting also on much earlier work, notably Eteaching92, the concept of 'value added' is useful here, because it implies a measurable improvement. So the shortest, most general, way to phrase this would be:

- 'what value can ICT add to management learning?'

5.4 *Defining the Case: Bounding the Territory.*

In this instance, a useful boundary has been marked by setting out the areas for review, as the research is grounded in several different areas of literature. Given that chapter 6 is a critical literature review, the following domains were identified as relevant:

- *Management Learning* covers the whole field of how managers learn both practical and theoretical aspects of their work
- *Information Systems* literature and conferences include a considerable amount of material about the use of information systems in learning and education
- *Educational research* is relevant for insights that it offers, for example, about how to measure educational outcomes (eg, Cohen, Manion, and Morrison, 2000). Also

much that has been written about higher education discusses the use of new technology (Laurillard, 2001). Laurillard's work since the first edition of *Rethinking University Teaching* was published in 1993 has been very influential on higher education policy in the UK and is thus highly relevant to the context for the work covered here

- *CMC (Computer-mediated conferencing) and CSCW (computer supported co-operative work)* literature focuses on how people work together using computers (Usability First, 2002). The linguistic tools already mentioned earlier overlap with this domain, because co-operation with the assistance of computers implies a discourse that these tools can help to understand. Tsai (2001) has written a PhD thesis grounded in the CMC literature and using linguistic tools to analyse discussions in a number of virtual fora. Within the constituent papers there are examples of discussions enabled electronically (Eteaching92, GroupWork94) and also of the creation of communities
- *Learning organisations* encompass some literature based around systems theory and particularly ideas taken from system dynamics. Senge (1992) puts these issues into a form clearly accessible to managers though he has been criticised for presenting others' work in a popular form more than carrying out his own original research. There is also some specific systems-related literature to do with the use of business simulations in learning, referred to by Senge and others as 'Microworlds', which is grounded in systems thinking and has informed business practice (Morecroft, 1999). This thinking contributed to the decision to structure Trent Engineering as simulation. The simulation aspects are particularly reviewed in TechTeach97, which also cites the earlier *Proteus* simulation run by a number of universities, as a formative influence
- *Knowledge management* addresses the acquisition and development of knowledge within an organisation, and is a current issue affecting the use of ICT in business (Davenport and Prusak, 2000). This area touches on such fields as building up creativity and knowledge in teams (Leonard and Swap, 1999).

Mapping these domains and the links between them leads to the model below:

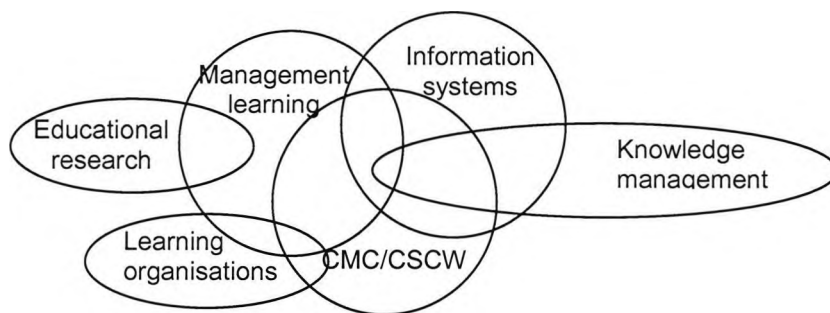


Figure 5.2 Contingent domains

Another boundary is created by looking at the core theme running through the constituent papers, and the common theme here is very clear. It is the use, or teaching, of ICT in a particular Business School setting. All the papers either discuss practical teaching cases, or the relevant research methods and their relationship to teaching (ResLinking02), or the context in terms of physical space (21stCenturySpace02).

One idea, which as mentioned above is implicit in many of the papers, was to define the case as use of ICT in learning in an ‘urban environment’ was to exclude the distance education field which has been extensively researched already, and to consider how some of the concepts of distance learning could be adapted for other environments. The interest in an urban environment has led to a more general interest in the type of space used by campus-based universities in the future (21stCSpace02) and has raised some interesting issues, around the relationship between space and knowledge, which are returned to in chapter 5 below.

5.5 *Sampling: Bounding the Collection of Data*

A staff PhD by papers, such as this one, typically takes a set of existing items as the core of the PhD submission. As discussed in section 5.1, data is provided by the pre-existing papers, and to the extent that the research is based on practical observations

and experiences, it is based on experiences within the Business School at City University over an extended period of time.

The unifying paper adds an analytical dimension to the other papers: the university's requirement is for a 'reasoned argument' that connects the papers together. The core of that reasoned argument is contained in the commentary on the constituent papers. However, other chapter headings within the integrating paper have been chosen with regard to the author's favoured learning styles:

- a) A critical review of relevant literature (chapter 3). As well as being expected as part of a PhD submission, this suits the *reflector* element in the author's learning style, and it allows connections to be identified between the areas of inquiry listed in section 5.4 above. In particular process of compiling this review highlighted the centrality of reflective practice in the research, and the many interactions between reflective practice, the use of knowledge, and pedagogy.
- b) Practical experience over the years of working at the Business School, which is particularly codified in the 'timescale and journey' section. This approach provides some application for the *pragmatist* in the author's learning style.

5.6 *Instrumentation*

'Instrumentation' refers to the approach taken to measure any original data gathered as part of research. In this case, given that the research here is largely qualitative, it provides a convenient heading to how the existing papers can be analysed to identify important themes.

As mentioned above, one structured tool for analysing the existing papers is to relate them to the research questions identified in section 5.3 above. Not all these questions were articulated when the papers were written, but reviewing these papers at a distance, each one has some direct relevance to one or more of points i-iii. Point iv, about what has changed since the paper was first written, is by its nature relevant to

any paper except possibly the very recent ones. The connections are listed on the matrix in section 6.3, which draws attention to how a reader of each paper might address each of these questions. Note that the perspective is that of a reader reviewing each paper in the autumn of 2003, not the supposed perspective of the author(s) when writing each paper. This historical, or review, perspective adds a level of reflection, and is also essential to respond to the fourth question. Matrices are valuable tools for summarising what is covered and discussed in the constituent papers.

A *repertory grid* technique is used in section 6.9 to collate the qualitative issues raised in the papers. This is a well-established tool for analysing qualitative data and in this case is used to draw attention to the development of ideas over time, as represented in the constituent papers.

It is worth remarking that the use of these instruments is an example of reflection-in-action, because it entails asking a new set of questions about an existing set of issues. This approach also fits well with the definition of Mode 2 research introduced by Gibbons et al (1994) as the production of knowledge from practical application.

6. Commentary on the constituent papers

6.1 *Background*

This section takes two particular angles on the body of work; combined with the other sections it provides a measure of triangulation. These are:

1. The university regulations require a *reasoned argument* to support the award of a PhD by papers (City, 2003, section 4.2), so a purpose of this section is to provide the basis for such an argument. It needs to be read in conjunction with the account of the personal journey, because it positions the constituent papers as a coherent piece of work worthy of award of a PhD, and because the reasoned argument constructs an account of research, over some years, from the constituent papers, it draws on the *narrative* approach to qualitative research (Polkinghorne, 1988; Boje, 2001).
2. Additionally, an approach used throughout this section is to survey the constituent papers as dispassionately as possible, rather as a PhD might be based on the body of work of a particular scholar over a particular period.

As an aside this approach reflects the challenge of defining a research topic in the social sciences, which in turn has resonances in the work of Gibbons et al (1994). In the arts – notably in history or literature – it is possible to define a research question in terms of one author's written work; it is a much greater challenge to do this in the social sciences.

However in the particular case of a PhD by papers, such as this one, where the starting point is a body of existing work, there is value in an author placing themselves in the position of an outsider reviewing their own work. This approach is consistent with the emphasis here on reflective practice, depending as it does on framing new questions about existing work.

There are of course limitations in that the author is not an impartial observer of his own work. However all except the last two papers (InfoLiteracy03, ActionRes03) were originally conceived before the decision was taken to aim for a PhD by the papers route, so there is value in reviewing them as part of a whole. In all cases there is at least some elapsed time between the papers being written and the PhD submission, which again allows the author to assume a measure of detachment.

Two research instruments are used to structure ideas within this structure. The matrix in section 6.3 is used to locate the constituent papers through their connection to a set of issues, highlighted as relevant to the author's present ideas; these issues have in turn been reviewed in chapter 5. The repertory grid in section 6.9 traces the development of the author's ideas through the sequence of papers. Together these instruments show the exercise of original thought, which is part of the PhD requirement, by establishing the continuing relevance of the earlier papers and by demonstrating that the papers form a consistent stream of research.

6.2 *Argument for PhD*

As stated in the introduction, this chapter contains the core of the reasoned argument for this body of work to be awarded a PhD.

City University's academic handbook (City, 2003) makes no stipulation about the number or nature of the papers to be included, where staff submit published papers as part of a PhD. It is stipulated that the linking paper (this document) is an integral part of the submission and should be examined as such. Therefore the requirement is that the totality of work submitted, in any form, must meet the university's standards for a PhD.

Clause 8 of ordinance C3.3 (City, 2002) states that the thesis or papers submitted must be judged by the examiners to

Contain sufficient evidence of systematic study and to make an original contribution to his or her subject, shown either by the discovery of new facts or by the exercise of independent critical power.

This is in addition to the requirement to pass an oral examination and to fulfil any other requirements laid down by the university.

Clause 7 (e) of ordinance C3.3 states that joint work may be submitted as part of a PhD, so long as there is a statement from the co-author(s) of the candidate's contribution. Co-authors' statements are contained in appendix 2 of this submission.

The analysis in 6.9 demonstrates a tight focus running through the papers, on the application of technology to learning in a particular environment (an established university in a city centre) and a particular subject (business) but combined with a broad range of influences. This is presented here as evidence of systematic study.

This focus within the constituent papers is distinctive, and can be summarised by stressing the use of ICT as an *adjunct* to other channels for learning. Therefore the earlier papers (notably Eteaching92, GroupWork94, TechTeach97, Community97) are written around the experience of the Trent Engineering case and related innovations. As use of the Internet became more widespread, and the contribution of new technology to established universities became more established, the reach of the constituent papers extended beyond practical examples to issues of how research and teaching could be integrated in the context of innovative use of ICT (ResLinking02, ActionRes03). This is presented here as an instance of an *original contribution* to the subject of management learning.

Evidence of originality of the work carried out during the 1990s can be derived from a comparison between the author's work, and applications of ICT in learning that were current at the same time. Kaye (1992) wrote of 'learning together apart', adapting his ideas from the concept of 'working together apart' which in turn originated with Grenier and Metes (1992); this at once established connections both with business and

with distance education. Harasim (1990) introduces the concept of *intellectual amplification* as a possible benefit from using computer communication technology: she writes about conferencing as a (then) new technology that had grown up since the early 1980s, and facilitated the organisation and sharing of ideas. She identifies time independence, and the text-based nature of the discourse (which introduces, for example, the benefit that learning with the aid of computers can be self-documenting) as important. She also lists 'active learning' and 'knowledge building' as characteristics. These last two are also points that are built on effectively in within the constituent papers, so Harasim's work offers one possible source of theoretical grounding for the author's research.

McCreary (1989) discusses the possible impact of computer conferencing on a higher education institution – in this case the University of Guelph in Canada – as it appeared a few years before the first of the constituent papers was written. Her emphasis is on the scope introduced for greater collaboration across geographical boundaries than had taken place before, and indeed hers is one chapter within a volume that focuses on distance education.

These examples support the argument that the author's distinctive focus – on a traditional university with campus-based students, and on using technology to add value – constitutes originality.

Discovery of new facts is not always an appropriate requirement in the social sciences, where research tends to be directed towards new understanding and new insight, and where differing perceptions of reality can blur the perception of a 'fact'. However the discovery, in the early papers, that value could indeed be added to a full-time postgraduate degree programme, is proposed here as a new fact. Likewise the discovery in the later papers of the potential to link teaching and research in new ways is proposed as further discovery of a new fact.

Independent critical power runs through the papers, with the caveat that as time continues there is a tendency for a greater number of the papers to be jointly written (this

suggests that the team of which the author is a member has become better at producing research output collaboratively over the years). It is evident in the application of a broad range of influences to the central topic, and is reinforced by the analysis in the sections that follow.

6.3 *Issues as lenses*

Based on reviewing the constituent papers as a complete body of work, and also on reviewing the domains and concepts that inform the author's present ideas about learning, four issues were identified that can be used as lenses through which to review the constituent papers:

- The effect of different *learning styles* on the learning experience
- How much the emergence of *virtual communities* is relevant to the paper
- What insights can be gleaned about the broader *applicability of ideas* covered by the material, beyond a single institution and also outside the higher education sector
- *What has changed* since the paper was written that could alter the significance of the material

These issues have been discussed further in section 5.2: the emphasis here is merely on what insights they offer into the constituent papers.

The matrix that follows summarises points which arise from each of these papers in the light of the four issues.

Constituent paper (ShortName)	Learning styles	Virtual communities	Applicability of ideas	What has changed
Eteaching92	Not discussed	The international collaboration exercise in the paper is an example of a virtual community	Not discussed	Much wider use of the Internet and asynchronous communication technology. Concepts mentioned here as exotic (notably bulletin boards) have become mainstream
GroupWork94	Explicitly discussed in terms of the type of exercise most suitable for group work and collaboration	International tasks, in this case the extension of the Trent case study to include a continental European dimension	Not directly but the separation of learning and assessment, mentioned here, is a concept adapted from in-service training	There is discussion in the paper of the need to explain windowing systems and mice to students – which would now be completely unnecessary

CaseStudy95	Not explicitly discussed	Draws on international collaboration etc	Explicitly discussed in the opening – also the point is made that we were applying some of the ideas of distance learning to a face-to-face environment	A 'mass of data' is referred to, expected to be available at the end of the Trent exercise – this is reflected in more recent work
Community97	Different responses from students to electronic and paper versions of the same case	Emphasises the community aspect of the exercises, even though in practice the community is not solely a virtual one	Discussion of different students' response and of the move towards introducing new technology in higher education (eg Laurillard's work)	Use of the Internet is now much more acceptable as a component in teaching something superficially unrelated (for example human resources management)

TechTeach97	Implicit in discussion of the different influences (eg Proteus) Explicit in discussion of tensions within groups	International community and references to other communities	Discussion of particular views of higher education, notably the computer board's view of the 'university of the 1990s'	List of technological prerequisites covers points that are now well established
Weblessons99	Observations about different cohorts – undergraduates, MBAs, etc	Strong emphasis on the international aspect and also on the differences between the responses from participants in different countries	Considerable discussion of the barriers to use of technology in practice, and of the impact of changes in higher education policy (eg the Dearing report)	Much wider range of web tools and services available, with much more professional support than was the case in 1998-99

Virtual00	Using the virtual organisation module within an established course to introduce new <i>teaching</i> styles – some of the link to learning styles can be gleaned from Grasha's work	Virtual organisations (in the broadest sense) as a subject for an elective module within an undergraduate business degree programme	Broader issues of moving away from pure use of the lecture method	The elective module is still running very much as originally conceived despite changes in technology and business process
Barriers01	Extent to which both students and faculty are comfortable with new technology in learning	Not explicitly discussed	Very direct implications for academic policy and training approaches	Although some technology (notably virtual learning environments) has become more familiar among academics in principle little has changed

ResLinking02	Implicit in the discussion of the importance to be accorded to teaching	Not explicitly discussed	Implications for research policy (as well as setting the research context for the PhD)	Still very much an active issue with broader ramifications than are covered here
21stCSpace02	Providing space for different types of learning and different favoured approaches	Discussion of the type of physical and virtual spaces used by learning communities	Relevant to other types of physical space as well	Still current
InfoLiteracy03	Practical issues about different students' responses to the need to gain information literacy skills	Not explicitly discussed	Information literacy issues are equally relevant in business and in other courses	Still current
ActionRes03	Discussion of our need to learn from the student cohort	Not explicitly discussed	Action research framework can be applied very widely	Still current

Table 6.1 Analytical matrix

Two particular issues are apparent from surveying this matrix:

- i. For 10 of the 12 papers it is possible to draw a close link with *learning styles*. This validates the inclusion of learning styles in the list of current key issues, and confirms the importance of an ability to deliver materials suitable for a range of learning styles and strategies.
- ii. It is possible to draw inferences about *applicability* from all the papers except Eteaching92, the earliest paper which is very clearly focused on implementation within a university setting. Nevertheless there are significant differences between the broader applications envisaged by the author, when this set of issues as lenses was identified, and the those that emerge from reflection about the papers. The author initially viewed this issue in terms of adapting the approaches covered in the constituent papers to a business setting, and the motivation for this is discussed in chapter 2 above. In practice the issues highlighted in the papers have more to do with strategy and policy in the Higher Education sector.

Re-reading the papers at this stage, it is clear that the research had greater significance for higher education policy than was recognised at the time. It did inform City University's strategy during the 1990s, and City University's forays into delivering programmes that are not campus-based – for example the Executive MBA tailored to the requirements of the Bank of China – have reflected this strategy in that they retain a core of face-to-face contact.

Asking *what has changed* about the earliest papers (Eteaching92, GroupWork94) invokes a connection with the discussion of information literacy in the recent papers (InfoLiteracy03, ActionRes03). It is also a salutary reminder of how much it was once a higher education institution's responsibility to teach basic computing skills to students, but in many cases this responsibility has been passed to secondary or even primary educators. This transition is recognised by Laurillard (2001) as a new challenge for university educators.

6.4 *Evolution of learning exercises at City University – early years*

The earliest paper (Eteaching92) is a wide-ranging outline of a whole series of initiatives that were carried out at the business school in the early 1990s. Reading it now, it is striking for the breadth of different exercises that were carried out at the Business School at such an early stage in the use of networked computers, and for the ability to support such a range of activity on hardware that now looks extremely simple. In 1992 the business school's computer facilities for students comprised a mixture of stand-alone DOS-based PCs and Sun workstations. The Sun workstations offered graphics and even a simple graphical mail interface, but, except for the minority who were experienced Macintosh users, students were typically much more familiar with keyboards and simple text menus than with mice and windows. There was even a simple (DOS) PC emulator within the Sun workstations so that students could use them, if they needed, as though they were simple PCs.

The CUBS working paper (Eteaching02) was submitted to an international competition in 1993 and won a 'Coup de Coeur' – roughly equivalent to 'special mention of the judges' in English.

One other important reflection: there is reference to a collaboration with California State University was arranged through Ralph Lewis, at the time a Professor of Human Resources and an academic who made a point of eschewing the lecture method. He and the author communicated over several years by e-mail. They eventually met in Los Angeles in 1998. At the time the experience of meeting somebody face-to-face for the first time after several years' electronic communication was a very unusual one: now it is much more part of everyday life. In addition during the preparation of this paper, the author was in e-mail touch with academics at Carnegie-Mellon University in Pittsburgh, who were involved in pioneering work on the creation of virtual communities, and also were working in an environment where *networked* computers had been embedded since the early 1980s (Sproull and Kiesler, 1990; Kiesler and Sproull, 1987). Also in Pennsylvania, the author had the privilege of meeting Gerald

Phillips, a pioneer of the use of ICT in education, and seeing how Phillips, reluctant to leave his home because of ill-health, used technology to work with students on a campus a mile away.

March (1987) discusses the response of Carnegie-Mellon to the rapid change of the times in the use of technology. One interesting thought, which proved to be completely false, was that because higher education was sometimes associated with 'counter-snobbery', for example towards flashy clothes, there was the possibility of computers acquiring negative symbolic significance. March's theme is the dichotomy between an established and conservative institution (a university) and the radicalism imposed by new technology; in the constituent papers this can be seen both in perceived resistance to innovative learning in Eteaching92, and the barriers to innovation encountered much later in Barriers01.

March offers interesting insights into the effect of the then new technology on information handling. One particular example should suffice: there is a description of a discussion thread, started by a researcher who was looking for a particular book. Most responses were supportive, but there was one very critical comment from a librarian. The researcher looking, not for the book, but for some much more specific information within the book, and the librarian as a specialist could have pointed him towards a selection of relevant sources. While the detailed issues have changed, the same imperative to encourage development of students' information literacy skills remains, and is the motivation for the work covered in InfoLiteracy02.

Reflecting on the contrast between the author's work at City University and the example of Carnegie-Mellon (and of other contemporary exercises), the author's work has a distinctive slant in its attempt to build a specific instances of ICT application into existing courses within an existing institution. One interpretation of work documented by Kiesler and Sproull (1987) is that Carnegie-Mellon, as a small specialised university, set out to 'informate' itself, to use the language suggested by Zuboff (1988) and with financial support from IBM, as a way of becoming a distinctive institution. By comparison, the Trent Engineering case study and the other

contemporary work described in Eteachin92 were one element in a tangible effort at City University to build a distinct niche at the overlap of business and information technology. However this niche was expressed in the emergence of particular initiatives, for example the option within the MBA programme to specialise in information technology management, and not in any philosophy embracing the institution as a whole.

Electronic mail is accorded little importance in much of the literature from the early 1990s, which places a greater emphasis on computer-mediated-conferencing (CMC); Kaye (1992:13) acknowledges that electronic mail, and newsgroups which provide a simple, standardised, electronic discussion environment, contribute to 'helping to develop and maintain inter-institutional links'. This is one of the reasons for the use of e-mail discussed in Eteaching92, but the reliance through much of the work on the use of universally available web and e-mail facilities is another distinguishing feature.

6.5 *Information skills and literacy*

It is interesting to compare the observations on training in the light of the recent papers about information literacy (InfoLiteracy03, ActionRes03). The distinction between skills training and teaching remains relevant, and it is still an important challenge to convince students that they need to learn computing and information related skills. But the barriers to this learning have changed: in 1992 a senior manager might still not want a computer on his desk, while now the problem is to convey that the skills and concepts learned at school might not be sufficient for an MBA (InfoLiteracy03).

From summer 1993 the standard computer in a student open-access area was a PC with Microsoft Windows 3.1 . These computers did not, at first, offer web access although they were networked and could be used to reach e-mail through simple text-based packages such as ELM or PINE. Printing was also difficult and cumbersome: printing to a laser printer usually required the students to create an intermediate PostScript file. It was difficult for a tutor to explain this convoluted process except in

purely mechanistic terms, and knowing how to print in the computer room in Frobisher Crescent (the Business School's principal building at the time) did little to equip students to handle awkward computing challenges which might occur later in their careers.

Students' prior knowledge remains an essential factor in choosing how to structure learning exercises. The shift from the e-mail based (Community97) to web based (WebLessons99) versions of the same case study was a direct response to a change in students' expectations, although it imposed changes on the structure and flow of the exercise. Nevertheless an underlying theme remained the same in this exercise. Both papers emphasise the community aspect of the exercise and the importance of *communication* technology in creating this community.

Another clue to the importance of communities linked by electronic means comes from the matrix above, and the extent to which virtual communities are relevant to the different papers. International collaboration, and the ability to build communities that cross more traditional boundaries, constitutes a way in which tangible value can be added to a learning experience (Eteaching92, CaseStudy95). Also the concept of virtual communities fits closely with the subject covered in the new material taught about the virtual organisation from 1999 (Virtual00)

The two most recent papers (InfoLiteracy03, ActionRes03) were written in parallel, and represent a belief that familiarity with technology does not automatically bring a sustainable ability to manage information effectively. These papers focus on the immediate experience of redesigning the start of the MBA course and linking that experience to relevant material on information literacy. In InfoLiteracy03, the analytical component comes from understanding the changes in the student cohort, and particularly in their prior experience in using ICT, over the years and in the difficulty in offering material which meets students' expectations, and also satisfies the needs that arise later in their studies.

ActionRes03 unpicks some recent exercises with information literacy and tests how effectively it fits with a serious research methodology. It also discussed how an appropriate intervention can ensure that the students' learning experience continues to fit their needs and expectations. While information literacy is not superficially as exciting or novel a skill as it appeared in the 1990s, it is clear that there remains a lot of scope for developing students' abilities.

6.6 *Student response and learning styles*

Learning styles and strategies were identified in chapter 2 as a key factor. While there is little explicitly that runs through the papers about this, the matrix in 6.1 demonstrates that each of the papers has some implications in terms of learning styles.

Re-reading the second paper that covers Trent Engineering (GroupWork94), it is interesting to see some student evaluations, both quantitative and qualitative, quoted and instructive to reflect that this was not a universally popular component of the MBA programme. Although there was a lot of constructive engagement by some students, there were also many who were sceptical of the exercise's value, and critical of its implementation. This can now be seen in terms of the development of the personal computer: the early 1990s could be seen as the peak of the personal computer's use and recognition as a simple, stand-alone device where the only cable was the power supply. The value of a *connected* PC was not widely recognised. It is also worth recognising that sometimes the goal of achieving high scores from students conflicts with the need to innovate and experiment.

In retrospect this variation in response can also be seen in terms of learning styles, and in terms of differing responses to technology. Cuthell (2002) reports that, even within the last few years, a minority of schoolchildren remained resistant to any use of ICT: it should be no surprise that a similar resistance was encountered among some postgraduate students in 1992-1994.

Perhaps a good way of summarising attitudes is in the anecdotal feedback from Paul Gant, one of the 1992-3 students, in the years after the course. He regarded us as visionaries for recognising the importance of the, then embryonic, Internet but was frustrated that we had not managed to convince him how important it was to become in the years to follow. (Gant, 2002).

It is instructive to compare the experience of presenting ActionRes03 at a conference with that of the earlier papers. Papers such as Community97 and WebLessons99, which had a stronger descriptive element, were good for dazzling the audience with the notion that innovation and originality in teaching methods was the norm at City, and to convey the author's sincere belief this is a major strength for the business school at City University. Also it was easy to convey the author's own enthusiasm, which translated into a willingness to devote energy to the project – in Myers-Briggs terms this fits the author's profile as an ENTP: ENTP and ENFP types are 'tireless at what interests them, but find it hard to get other things done' (Myers and Myers, 1980: 108).

While ActionRes03, with a greater emphasis on academic rigour than some of the earlier papers, felt less immediately exciting to talk about, it clearly gathered resonances from the other people in the audience who had experience of working with similar material. Moreover, the increased academic rigour reflects the increased maturity of the subject, as there is more scope to identify suitable interventions which can enhance the learning experience. The pace of change during the 1990s – apparent from the 'what has changed' column in the table above – was such that it was difficult to identify sustainable enhancements to learning activities.

6.7 *Culture of innovation*

Re-reading the early papers (Eteaching92, GroupWork94), there is a clear sense of a culture of innovation, if only because of the range of projects mentioned. One other product of the same culture was the COMMDATA proposal, which was described as a virtual learning system, and which provided many similar facilities to those now

provided by virtual learning environments. It is instructive to see how similar the currently favoured term, virtual learning environment, is to that proposed for COMMDATA.

In 1992 all MBA students were already expected to have their own computers and a significant minority chose lap-tops. But these were used almost exclusively as word-processors, with some using them also for spreadsheets and for simple computer graphics. By 1993 many would have adopted Windows 3.1 but WordPerfect for DOS remained popular as a word-processing package.

All of the papers demonstrate a continuing commitment to integrate research into teaching and learning at the business school. This is further codified in ResLinking02 which draws on work by Gibbons et al on the type of institutions that universities should be in the future.

A major innovation for the business school at City University, at the end of 2002, was the move into a new building. While 21centurySpace03 is not specifically about the new Cass building, it discusses a number of innovative models which informed the design of the new learning environment.

Van Baalen and Moratis (2001) write about the implications of the 'new economy' – and therefore of the changing landscape within which business schools need to operate – on management learning with particular reference to their experience at Erasmus University in Rotterdam. In their conclusions they lament the paucity of academic leadership available to guide business schools into the new structures that they deem necessary to meet the new economy's demands. The extent of collaborative work in the constituent papers, and the trend towards more active collaboration over time, during the period within which the constituent papers were written, are evidence of a movement to introduce innovative learning methods within the business school, and to orient these methods towards students' requirements, that had support from several members of faculty.

Van Baalen and Moratis also emphasise the need to value adaptation, in the sense of gradual change, performed with sensitivity to the requirements of those affected by it, and cognisant of the need to retain knowledge that is there at the start of the change process. The work covered by the constituent papers is firmly rooted in an existing business school and its degree programmes, and is distinguished by the importance accorded to adaptation as well as innovation.

6.8 *Policy issues*

Because the chapter from *Smoke signals to Satellite II* (CaseStudy95) was published alongside a number of other cases, it is written to locate the Trent Engineering exercise clearly as an attempt to use some of the ideas of distance learning in a setting where face-to-face learning was the primary medium of instruction. This has implications for the university's strategy at the time that the paper was written, and for consideration of how much the university should build on its location in central London as a strength.

Part of the historical context for this was that it predated the Dearing report (Dearing, 1997) which set out to map a future for higher education in the UK. Within City University there was discussion of the type of teaching and learning that should be offered in the future. It was recognised that the university's location in central London was one of its selling points, and that in economic terms it was sensible to adopt a strategy that took advantage of this. For example the university's premises in central London were an expensive resource that could best be exploited by promoting face-to-face learning.

There was also strong anecdotal evidence that students who had chosen to study part-time in London, such as evening MBA students, were quite resistant to using technology in learning. One reason for this was simply resistance to learning an additional user identity and password to use the university's system, and this presaged the problems that many Internet users now have with password overload. But another was that these students had explicitly rejected the option of distance learning, and

resented being asked to use tools that in practice were usually associated with distance learning.

City University's strategy of the time is not explicitly discussed in any of the constituent papers, but re-reading them now, CaseStudy95 is very clearly informed by that strategy.

TechTeach97 covers the same Trent Engineering case study as some of the others; it contains a much more detailed discussion of the surrounding issues than has been covered hitherto. In particular the reasoning behind the simulation, and other business games, such as the Proteus simulation used at Aston Business School, are discussed.

ResLinking02 is directly concerned with the relationship between teaching and research, and has very significant implications for the strategy and management of universities in the future.

The focus on university-based learning, and the exclusion of specifically distance learning from the research, was initially a pragmatic decision based on an interest in what City University could do to benefit from new technology. This was rapidly refined into the question of what lessons campus-based universities could learn from the approaches used in distance learning, and in particular how value could be added to a traditional university course – as articulated in Eteaching92.

6.9 *Repertory Grid Analysis*

A *repertory grid* technique is the instrument used here to collate the qualitative issues raised in the papers, and particularly the development of these issues over time. The philosophical foundation of these techniques is in personal construct theory (Kelly, 1955), which in turn is premised on varying individual constructions of reality, combined with a shared construction of reality among people working together. This is an effective model for examining an individual's progress over a period, and

coincidentally the same underpinning philosophy for a teaching environment where individual differences are valued. Repertory grid technique is highlighted by Easterby-Smith et al (2002) as a tool with relevance to qualitative research in management. Fransella et al (2004: 6) describe the approach as 'an attempt to stand in others' shoes, to see their world as they see it, to understand their situation and their concerns', so a useful tool both for studying the student experience and for reviewing my own learning over the period under discussion. Furthermore they observe that grids can be 'viewed as providing snapshots of a particular person at a particular time in their life' (Fransella et al, 2004: 153). In a special issue of the *Journal of European Industrial Training* devoted to the use of repertory grids, Easterby-Smith et al (1996) emphasise the broad applicability of the technique but are especially concerned with its use in facilitating and analysing personal change.

Repertory grids can be used to find patterns in individual responses to a number of *bipolar* issues – that is issues which can be stated in terms of two opposite responses. For example distance learning / face-to-face learning, and self-directed learning / didactic learning are examples of issues that can be placed on bipolar scales in a pedagogic context. In Kelly's terms these bipolar scales are known as *constructs* where these are applied to a number of different *elements*. Repertory grids appeal because they are a way of eliciting, and putting some structure on, views of the world that might be written or said in different places.

While repertory grids can be used to create quantitative data, which is then suitable for statistical analysis, from qualitative findings, in this context they are used purely to add some structure to issues raised in the papers. To attempt a quantitative approach on one's own work would simply be to invite the danger of creating a body of impressive-looking but meaningless numbers. Computer packages and statistical tools are available to assist with analysis of repertory grid results, but Easterby-Smith et al (2002) remark that simple grids can be analysed by hand. The only numeric tool used is to construct a simple correlation matrix to draw attention to any close correspondence between the elements.

One acknowledged use of repertory grids is to trace changes in perception over time (in their early applications in therapy they were used to gauge how a patient's views of the world around might change during treatment) and here they are used to trace developments in the perspective represented by these papers over time. In contrast to the matrix in chapter 6, which focuses on a current reader's response to the constituent papers, the repertory grids set out to recreate the author's own thoughts when the papers were being written.

Easterby-Smith et al (2002) and Stewart and Stewart (1981) emphasise the importance of remembering the focus of a repertory grid analysis. The focus of the analysis here is to give some shape to the *evolving* ideas represented by the constituent papers: in that way it complements the analysis in the matrix in 3.2.

Construct elicitation is an important part of the process. In the repertory grids that follow, the *elements* are the constituent papers and the *constructs* are derived from the headings used above for sections 6.3-6.8. These headings in turn represent clusters of issues which arise when writing a discursive commentary on the constituent papers. This technique differs from the *triad* approach most commonly used for construct elicitation, in that the constructs used here flow naturally from the review of the papers. In a triad approach, constructs are chosen so that it is possible to select three elements, where two are at one pole of a construct and the other is at the opposite pole. However, as a check on the validity of the constructs, triads of elements are identified in the table below.

Fransella et al (2004: 31) describe *eliciting from self-characterisation* as Kelly's 'truly qualitative method of assessment': this is a method that invites a subject to write a character sketch of themselves in the third person, much as a close friend might write it. Again, the grid analysis below does not purport to use this approach precisely, but there are resonances between the work here and self-characterisation, both in the use of written material (6.3-6.8 above) as a cue for elicitation, and in the aim within this chapter as a whole to survey the author's work in the same way that an independent observer might.

The bipolar constructs set out to be value-free, to the extent that one pole should not be considered more desirable, or a closer fit with the research question, than the other. Returning to the metaphor of a journey, the work aims to travel through a variety of topics and take a variety of viewpoints, not to follow a unidirectional journey towards one 'ideal' set of constructs. This is consistent with the non-positivist epistemology posited in 2.3, in that the choice of constructs recognises the validity of a multiplicity of viewpoints. It is also consistent with an ontology that recognises a socially constructed reality, albeit in this repertory grid analysis a reality constructed through the author's view. Where other views are represented, for instance through students' experiences related in GroupWork94 or through a variety of educators' experiences of innovative learning in Barriers01, they are nevertheless mediated through the author's view. Given that the purpose of the grid is to offer insight into the author's evolving ideas, this is appropriate.

There is a temptation to read the poles of the constructs as though they are not value-free: an innovative culture might be seen as preferable to an adaptive culture, student response as central to a paper might be seen as preferable to its being peripheral, and so on. It is important to resist this temptation in analysis of the grids.

This approach to construct elicitation fits with the *interpretive* approach (within a non-positivist epistemology) where the constructs used in inquiry into a subject are determined and refined as inquiry takes place (Orlikowski and Baroudi, 2002)

Fransella et al (2004) are critical of researchers' tendencies to be over-concerned with reliability and validity, and in particular refer to Kelly's original notion that the best measure of validity of a repertory grid is its usefulness. They also suggest that some significant correlation between the constructs would typically be a sign of intrinsic validity simply because the grid has thus revealed a relationship between two or more constructs: correlations between the constructs used here are discussed in 6.10.7 below. They suggest discussing the validity of a grid in terms of its ability to reveal

patterns within the source data, and also in terms of its relationship to the personal construct theory that underlies the grid technique.

Certainly the use of a grid in this instance has revealed some patterns which are not apparent from an initial reading of the constituent papers – for instance the shift between an innovative and adaptive climate – and suggests that the constituent papers can be ‘mined’ to provide greater insights than were documented in the papers themselves.

Given that the repertory grids below set out to provide insight into the author’s view of a subject over time, their purpose fits well with their basis in personal construct theory.

The *range of convenience* is a term used in grid analysis to measure whether the constructs really can apply to the elements: every construct can only apply to a certain set of elements. This is not a trivial issue in analysing the constituent papers, since they discuss different, though overlapping and linked, subjects and not every issue is covered in every paper. Even where the constructs are elicited originally from reflection on the papers, as here, it is a legitimate concern: each construct is clearly highly relevant to at least one of the papers, but is it relevant to all of them?

In practice, it has been possible to measure each of the papers in terms of all the constructs, and it is noteworthy (and evidence of a range of convenience) that in each paper it is possible – reading it at this stage – to evaluate the presence of an innovative or adaptive climate, and to judge how central learning styles, and policy issues, are to each paper.

The first of the tables that follow shows how the constructs are elicited. The others, for each constituent paper, show the author’s assessment of how the paper relates to each of the constructs.

Section (above)	Construct	Question	Triad
6.4 <i>Evolution of learning exercises at City University – early years</i>	Leading-lagging	Are the pedagogic exercises described ahead of current thinking, or do they respond to current thinking and requirements?	Leading (Eteaching92, TechTeach97) Lagging (ActionRes03)
6.5 <i>Information skills and literacy</i>	Building-using	Is the focus on encouraging information literacy, or on taking advantage of students' existing skills?	Building (GroupWork94, InfoLiteract03) Using (Virtual00)
6.6 <i>Student response and learning styles</i>	Central-peripheral	Is discussion of students' learning styles and their response central to the discussion in the paper, or is it a peripheral issue?	Central (Barriers01, ActionRes03) Peripheral (CaseStudy95)
6.7 <i>Culture of innovation</i>	Innovative-adaptive	Is the focus on radically new approaches, or is it on improving existing approaches?	Innovative (Eteaching92, ResLinking02), Adaptive (Barriers01)
6.8 <i>Policy issues</i>	Integrated-separated	Are policy issues (within City University or the higher education sector as a whole) integrated into the discussion or are they separate?	Integrated (ResLinking02, 21stCSpace02), separated (WebLessons99)

Eteaching92							
<i>Evolution of exercises</i>	Leading	√					Lagging
<i>Information skills etc</i>	Building		√				Using
<i>Student response etc</i>	Central				√		Peripheral
<i>Culture of innovation</i>	Innovative		√				Adaptive
<i>Policy issues</i>	Integrated				√		Separated

GroupWork94							
<i>Evolution of exercises</i>	Leading	√					Lagging
<i>Information skills etc</i>	Building	√					Using
<i>Student response etc</i>	Central		√				Peripheral
<i>Culture of innovation</i>	Innovative	√					Adaptive
<i>Policy issues</i>	Integrated		√				Separated

CaseStudy95							
<i>Evolution of exercises</i>	Leading	√					Lagging
<i>Information skills etc</i>	Building		√				Using
<i>Student response etc</i>	Central					√	Peripheral
<i>Culture of innovation</i>	Innovative		√				Adaptive
<i>Policy issues</i>	Integrated		√				Separated

Community97							
<i>Evolution of exercises</i>	Leading			√			Lagging
<i>Information skills etc</i>	Building		√				Using
<i>Student response etc</i>	Central		√				Peripheral
<i>Culture of innovation</i>	Innovative		√				Adaptive
<i>Policy issues</i>	Integrated				√		Separated

TechTeach97							
<i>Evolution of exercises</i>	Leading	√					Lagging
<i>Information skills etc</i>	Building		√				Using
<i>Student response etc</i>	Central	√					Peripheral
<i>Culture of innovation</i>	Innovative	√					Adaptive
<i>Policy issues</i>	Integrated	√					Separated

Weblessons99							
<i>Evolution of exercises</i>	Leading				√		Lagging
<i>Information skills etc</i>	Building			√			Using
<i>Student response etc</i>	Central		√				Peripheral
<i>Culture of innovation</i>	Innovative					√	Adaptive
<i>Policy issues</i>	Integrated					√	Separated

Virtual00							
<i>Evolution of exercises</i>	Leading		√				Lagging
<i>Information skills etc</i>	Building					√	Using
<i>Student response etc</i>	Central	√					Peripheral
<i>Culture of innovation</i>	Innovative				√		Adaptive
<i>Policy issues</i>	Integrated		√				Separated

Barriers01							
<i>Evolution of exercises</i>	Leading				√		Lagging
<i>Information skills etc</i>	Building		√				Using
<i>Student response etc</i>	Central	√					Peripheral
<i>Culture of innovation</i>	Innovative					√	Adaptive
<i>Policy issues</i>	Integrated	√					Separated

ResLinking02							
<i>Evolution of exercises</i>	Leading			√			Lagging
<i>Information skills etc</i>	Building	√					Using
<i>Student response etc</i>	Central			√			Peripheral
<i>Culture of innovation</i>	Innovative	√					Adaptive
<i>Policy issues</i>	Integrated	√					Separated

21stCSpace02							
<i>Evolution of exercises</i>	Leading	√					Lagging
<i>Information skills etc</i>	Building	√					Using
<i>Student response etc</i>	Central				√		Peripheral
<i>Culture of innovation</i>	Innovative	√					Adaptive
<i>Policy issues</i>	Integrated	√					Separated

InfoLiteracy03							
<i>Evolution of exercises</i>	Leading					√	Lagging
<i>Information skills etc</i>	Building	√					Using
<i>Student response etc</i>	Central		√				Peripheral
<i>Culture of innovation</i>	Innovative			√			Adaptive
<i>Policy issues</i>	Integrated		√				Separated

ActionRes03							
<i>Evolution of exercises</i>	Leading					√	Lagging
<i>Information skills etc</i>	Building	√					Using
<i>Student response etc</i>	Central	√					Peripheral
<i>Culture of innovation</i>	Innovative			√			Adaptive
<i>Policy issues</i>	Integrated	√					Separated

Table 6.2 Repertory Grid Analysis

6.10 *Discussion of the grids*

6.10.1 *Preamble*

Before proceeding further it is worth reiterating both the purpose of the grids – which is to assist understanding of the progress of ideas over time, and a limitation on how they are used here – which is purely to structure thoughts, in such a way that analysis by hand (and by eye) can lend some insights.

6.10.2 *Evolution of Exercises*

First, taking the constructs one-by-one. *Evolution of exercises* reinforces the trend in the research, mentioned elsewhere, from encouraging students to use new technology to responding to their use. In fact the recent paper that most directly refers to technology *leading* innovation in teaching and learning is focused on the entirety of the teaching and learning environment, not merely on the use of ICT. This trend in the papers can be read as evidence of the increasing ubiquity of ICT, and as a reminder of the continuing need to take evolving technology into account.

This trend also offers support for a model of learning where *technology maturity* is a significant input into learning design. Even before any significant use of the Internet was introduced into courses at City University, there was strong anecdotal evidence that students feel most comfortable with the type of technology that was most familiar when they started to use computers: for instance some students who had used DOS personal computers extensively, reported difficulties in adapting to use of a mouse in a Windows or Macintosh environment. While enhancing students' IT skills, and increasing their range of IT competencies, has always been an objective, the technology used needs to be concordant with students' skills and expertise.

6.10.3 *Information skills*

It is striking that, despite widespread familiarity with ICT among students, the emphasis in *information skills* remains in building, and not in using, the skills. As the range of information available electronically increases, and students' knowledge about how to navigate this becomes more embedded, and harder to articulate, the challenge of educating students in information skills is shifting. Historically it was about tangible, almost mechanical, processes such as the etiquette for sending and receiving e-mails. Now it has more to do with reviewing and understanding the cognitive processes that students use in searching for information.

There is one sense in which using students' information skills has become important, but which is not reflected in the grids, and in fact highlights a weakness in the use of bipolar constructs. Students now embark on courses with enough expertise that it is possible to build on the collective knowledge within a cohort, and to share this knowledge. So InfoLiteracy03 and ActionRes03 do include consideration of how students' existing information literacy can be used as well as how it can be built, for instance by asking students to suggest how they would approach a problem and by gathering experienced students' existing knowledge. Abbott (2002) includes some thoughts about the shifting nature of information literacy and how younger students, at least, come into university with a different set of skills from those that were common in the past. Perhaps these recent papers imply a different interpretation of building information skills as building *on* skills that already exist.

In both *building* and *using* examples the concept of situated learning (Lave and Wenger, 1991) is relevant. In *building* information skills, using the case of Trent Engineering, the community aspect of the work is emphasised in both Community97 and WebLessons99. With hindsight, both these papers (which were written within strict constraints on the length of papers submitted to the AMCIS conferences) could have been developed into papers that introduced an additional analytical dimension, by discussing the community aspect in terms of situated learning. In InfoLiteracy03 and

ActionRes03, the use of existing knowledge within the cohort is a characteristic of situated learning.

6.10.4 *Student Response*

Student Response is central in GroupWork94, which does reflect on student response to the Trent Engineering case in some depth, and discuss how student's comments could be acted upon. Response transpires to be peripheral, or close to peripheral, in Eteaching92, CaseStudy95, and 21stCspace02. These are papers which emphasise the design and implementation of novel approaches above the experience of using these approaches. Eteaching92 and CaseStudy95 are counterbalanced by other papers, eg. 21stCspace02 is grounded in practical experience, particularly of the design and development of the new Cass Business School building; at the time the paper was written, students had not yet used the building, and the authors made a conscious decision to write the paper about the broader issues of space and not only about the Cass building.

Student response is central, notably in ActionRes03, Virtual00, and TechTeach95, all of which discuss in some detail students' responses to innovation as elicited through interviews and through feedback forms, and, in turn, the university's reaction to these responses. During the period under review students' response was directly influenced by changes in technology, so this construct provides further support for a model of learning implementation, where technology maturity is a key input.

6.10.5 *Culture of Innovation*

The *innovative* and *adaptive* poles of the *culture of innovation* construct are derived from Kirton's (1994) description of innovators and adapters as contributors to the creative process. Kirton uses the terms to describe personal cognitive styles, where innovators and adapters have complementary skills and styles. Kirton defines cognitive style in terms of preferred ways of doing thing, where innovators favour radical changes and lack of structure, while adapters favour gradual change within a clearly defined

structure. Kirton is emphatic that this distinction is non-pejorative: neither innovators nor adapters should be favoured over the others.

In the repertory grid analysis above, these poles are used to describe the organisational climate at City University. Katz and Kahn (1978: 50) define organisational climate in terms of norms and values, but also suggest that an organisation's climate depends on 'the history of internal and external struggles, the types of people the organisation attracts, its work processes and physical layout, the modes of communication, and the exercise of authority within the organisation' – a definition which, read in connection with the constituent papers, suggests that the work covered by the PhD is intimately related to climate, especially in connection with modes of communication. Recalling that the purpose of the grid is to assist in understanding progress of ideas, this pole tracks the evolving climate within the university

Kirton (1994) links his cognitive styles to types of organisations, by suggesting that the bureaucratic structures typically found in business favour adaptation over innovation. This could be read as a plea to create a more favourable climate for innovators in business. In the example of City University the work described in the constituent papers was located largely within one group (at different times, a 'division', a department, and a 'subject group' within a faculty), and the experiences reflect the climate within that group.

While the earliest papers, eg GroupWork04, are marked as *innovative* on this scale, and the most recent papers, eg ActionRes03, are marked midway between the two poles (in this case because it discusses an *innovative* approach to a fundamentally *adaptive* challenge, of how to respond to shifting requirements), there is not a clear discernible trend away from innovation. In fact the papers that are marked most unequivocally as *adaptive* (WebLessons99, Barriers01) could be read as papers which either record (WebLessons99) or recommend (Barriers01) pragmatic approaches to introducing some adjustment to the pedagogic process in response to changes in technology. Both are written in the context of rapidly changing expectations from students and faculty, and the need to meet these expectations.

6.10.6 *Policy Issues*

Regarding the *policy issues* construct, the most remarkable feature is the preponderance of these being *integrated*. Where they are *separated* (Eteaching92, Community97, WebLessons99) this is because the papers concerned focus more on implementation than on planning. Even in Eteaching92, a case could be made for policy issues to be less separated than a preliminary analysis would suggest, because the breadth of the implementation implies a policy decision to put a great deal of effort into this style of learning. In Community97 and WebLessons99 the emphasis on creation of a community has clear resonances of the use of communities of practice (Lave and Wenger, 1991; Wenger, 1998), a concept which has informed recent thinking about how and where learning takes place.

The connections between the applications of ICT discussed in the constituent papers, the evolution of knowledge management and knowledge as a business resource, and the move away from a didactic style of teaching in higher education, are not immediately apparent from consideration of the papers individually. However, taking the papers in their entirety, there is a thread of facilitating collaborative learning, that is also reflected both in public policy and in the directions taken by many universities, including City.

6.10.7 *Correlations and dimante*

Finally, a simple correlation matrix has been constructed to highlight parallels and differences between the constructs. This has been derived by assigning scores from 1-5 for each construct against each paper, and the results are tabulated below.

Construct Element (paper)	1 Evolution	2 Skills	3 Response	4 Innovation	5 Policy
1	1	2	4	2	4
2	1	1	2	1	2
3	1	2	5	2	2
4	3	2	2	2	4
5	1	2	1	1	1
6	4	3	2	5	5
7	2	5	1	4	2
8	4	2	1	5	1
9	3	1	3	1	1
10	1	1	4	1	1
11	5	1	2	3	2
12	5	1	1	3	1

Correlation matrix

	<i>Evolution</i>	<i>Skills</i>	<i>Response</i>	<i>Innovation</i>	<i>Policy</i>
Evolution	1				
Skills	-0.11636	1			
Response	-0.50451	-0.26579	1		
Innovation	0.613677	0.54373	-0.43994	1	
Policy	0.033293	0.343019	0.157524	0.300768	1

Agreement scores (no. of times two constructs have the same value)

	<i>Evolution</i>	<i>Skills</i>	<i>Response</i>	<i>Innovation</i>	<i>Policy</i>
Evolution	12				
Skills	2	12			
Response	2	2	12		
Innovation	3	6	2	12	
Policy	2	4	6	5	12

Table 6.3 Correlations from repertory grid

The strongest correlations are:

- Between the culture of innovation and the evolution of learning exercises, suggesting that in an innovative climate the university has a tendency to use technology which is in advance of that already used by students. This is no surprise, on reflection about the nature of the innovative climate, but it is important to remember that an innovative climate implies more than merely using the newest technology.
- Between the culture of innovation and building, more than using, information skills. This suggests that there is a continuing parallel between the use of new technology and the imperative to build new information skills.

A further inference from this is the centrality of the issue of culture of innovation. So to conclude this chapter, it is worth reflecting further on this culture, and on the organisational climate within which this research was carried out.

While the organisational climate was predominantly one that encouraged innovation, it is clear that adaptation was also supported. This is apparent not only from the papers with a strong adaptive slant, but also from references to adaptation elsewhere: notably Eteaching92 includes descriptions of very specific responses to issues raised by students. Adaptation is highly valued in the knowledge management literature: notably Leonard (1995) advocates 'adaptive spirals' and change which builds thoughtfully from an existing position.

Another effect of this climate can be seen in the concepts that tacitly inform the work. It is consistent, not only with developing tacit knowledge and reflective practice (the whole could be termed *reflective online learning*), but with a range of issues that were not explicitly acknowledged, notably learning styles, the importance of context, communities of practice, and mode 2 research. While the emphasis within the constituent papers is on lessons from practical experience (ResLinking02 is an exception in relation to mode 2 research) the theoretical underpinnings become apparent when reviewing the papers as a complete body of work. In some cases, the theoretical underpinnings were not widely known or understood: knowledge management emerged as a topical issue during the 1990s, and communities of practice were only discussed from the early 1990s onwards in the wake of work by Wenger (1998).

It would be both arrogant and inaccurate to suggest that the author and his colleagues presaged a whole series of innovations in business, information systems, and research policy. However the constituent papers were written in an atmosphere infused with study of contemporary management ideas, as they were influenced by information systems. Executive information systems (in vogue during the early 1990s), knowledge

management, business process re-engineering, the growth of virtual organisations, and the rise and fall of e-business, all figured in the topics that were studied and taught. These topics, to a greater or lesser extent, related to the emergence of new approaches to work, which were informed by reflective practice and related concepts.

Conversely the climate was not necessarily conducive to mode 1 research (rigid, bounded, based on volumes of empirical data) into educational technology: this is not to disparage the great volume of mode 1 research produced in other subjects. The pace of change in technology was too fast for material to remain relevant through the considerably lead times entailed in submitting journal papers, though ironically this process of writing an integrating PhD paper has triggered a process of reflection that suggests that the earliest papers remain of interest. The most valuable data, in practice, was often communicated in a tacit form by students, and it is unclear that more structured surveys would have offered any useful insights. There was always pressure to move on and devise the next set of learning materials, rather than to mine the last set of experiences for publishable research findings. So mode 2 research provides a valuable framework within which to codify this work.

7. Concluding Remarks

7.1 *Key influences revisited*

Chapter 4 (section 4.4) included a discussion of a number of key people who, in some ways, influenced the author during the period during which the constituent papers were published. In this chapter it is appropriate to revisit these people's work and to remark on how the complete PhD draws on their ideas.

- *Shoshana Zuboff* is not explicitly an influence on the analysis in this paper, although she is cited in some of the constituent papers. However her analysis (Zuboff, 1988) does highlight the potential for IT to alter patterns of work. It also relates IT to the use of power in the workplace, which was the theme for the *Nancy and Sam* case study (Eteaching92), and raises the spectre of uses of ICT which, despite introducing new communication channels, in fact serve to stifle effective communication. These issues form an important part of the context for the constituent papers
- *Fernando Flores* created the language action perspective (Winograd, 1987). This is on the horizon in several of the papers, and Winograd and Flores are cited on occasions. And yet the prospect of using Flores' ideas to carry out an empirical analysis of communication among learners and teaches, is not followed up within the constituent papers. So Flores, arguably, remains an influence on possible further work. He is also relevant, though, because of his location in the world of systems thinking, which does inform much of this research
- *Alan Mumford* similarly provides metrics which could be used in further work, through his work with Peter Honey on learning styles. He also provides a bridge with the world of management training, which is also on the horizon in several of the constituent papers even where it is not explored in detail
- *Donald Schön's* concept of reflection-in-action has proved a unifying theme, both within the constituent papers and in the process of writing this unifying paper. In the cases discussed here, the value added by ICT invariably includes a measure of facilitation of reflection-in-action. Examples include the ability to introduce new insights into a case study by adding an international dimension (GroupWork94), and using students' analysis of their own information management strategies to facilitate collective learning. Taking

the research question from section 4.3 expressed in its simplest form ‘how can an organisation use ICT to improve the effectiveness of managers’ learning?’, the simplest answer would be ‘by facilitating reflective practice.’ Additionally, this integrating paper is itself the expression of a continuing reflective process

- *Dorothy Leonard* was included in the original list principally as a signifier for the world of knowledge management. However her work holds particular relevance because of its emphasis on valuing adaptation (Leonard, 1995), and the importance of adaptation to the evolution of students’ learning at City is highlighted in section 3.10
- *Michael Polanyi* did indeed enable knowledge management by writing about the importance of the tacit dimension. Throughout the research, it is notable how often the benefits from use of ICT are discernible through subtle, unquantifiable, factors
- *Harvey Brightman*, on the Master Teacher Program attended by the author (Brightman and Bahda, 2000), drew attention to the different personality profiles typically found among faculty members and among students in business schools, which in turn led to an interest in learning styles which has helped to make sense of the papers as a complete body of work.

7.2 Key outcomes

The central research question stated in 1.3 is:

‘How can management learning be enhanced, by integrating the acquisition and advancement of knowledge with Information and Communication Technology?’

This question does presume that the acquisition – in the sense that individual learners acquire and internalise knowledge – and advancement – in the sense that new knowledge can be created – of knowledge are vital elements of learning.

Reviewing the constituent papers and this integrating document together, a number of specific ways emerge in which learning can be enhanced:

- Information and communication technology does offer new scope to embed reflective practice in the learning process. This is especially relevant to management learning because of the connection between reflective practice and the emergence of the learning organisation (Argyris, 1999) which in turn is a response to the availability and ubiquity of new technology.
- A reflective approach offers scope for building up tacit knowledge, and for encouraging the creation of new explicit knowledge based on that tacit knowledge (Nonaka and Takeuchi, 1995).
- A reflective approach also offers scope to ensure that learners with disparate levels of initial knowledge, and with varying learning styles and strategies, can work together. This is particularly evident in InfoLiteracy03 which discusses the scope for exploiting knowledge that already exists within a learning cohort.
- New communication technology can overcome geographical boundaries in ways that are valuable, even for university-based students who have no desire to participate in any type of distance learning. Within the constituent papers this is most dramatically illustrated by the international collaboration on a case study, notably in Eteaching92.
- The emergence of communities, enabled or assisted by new technology, can facilitate the learning process. Communities of practice are well established as tools for experiential learning (Lave and Wenger, 1992; Wenger, 1998) and the constituent papers offer examples where building a virtual community is a key element in the learning experience (Community97, Weblessons99).
- Integrating the learning experience with action research provides a valuable link with reflective practice, and also offers constructive opportunities to connect scholarship with teaching and learning within a business school. This is demonstrated in the constituent papers, notably ResLinking02 and ActionRes03.

The constituent papers here represent a personal journey where each stage of that journey has some relevance to the core research question, which can be framed in terms of what value can be added to management learning through the use of new ICT. Within the constituent papers there are very practical answers (for instance allowing students to collaborate with students in other countries without travelling), more theoretical points (for instance discussions of learning styles, and of ways of integrating teaching and research), and the application of theory to practice (for instance the ability to tailor the learning experience to match students' temperaments and to suit their preferred learning strategies, the theme of adding value through facilitating reflective practice, and the development of research outcomes into new teaching approaches).

Reviewing the papers, in the light of current thinking, some further points emerge. Inevitably some of these overlap with points that have been made in earlier chapters, but they deserve restating and summarising here:

- The idea that electronic *communication* technologies have a place as a teaching tool in a conventional university, where the core method of instruction is face-to-face, was radical in the early 1990s (Laurillard, 2001). The current interest in the use of e-learning tools, notably managed learning environments and virtual learning environments, suggests that this idea has now entered the mainstream of educational thought. Many of the ideas that were introduced with the Trent Engineering case, and related exercises, from 1992 (Eteaching92), have resonances with ideas now being promoted for the use of virtual learning environments in established universities (Cuthell, 2002). This follows a pattern which is typical of the diffusion of innovation: applications are available for some time, but only become commonly used once the underlying technology is good enough for them to be exploited. For instance Hiltz and Turoff (1995) anticipated many of the characteristics of current Internet applications (chat-rooms, Internet bulletin boards, and so on), long before the Internet offered enough connectivity to make these viable as mass-market tools – it should be noted here that their work of 1995 was a re-issue, with a new introduction, of a prophetic work which had been published in the 1970s. Xerox developed the graphical user interface a decade before memory and processing power became cheap enough for Apple to implement it on an affordable personal computer.

- Over the years since 1992 there have been great changes in students' experience and expectation of computers and of the Internet. A challenge over this period has been to develop learning approaches which can be responsive to these changes. For instance in the first half of the 1990s many students had little practical experience of using personal computers, and those with PC experience were often most used to a DOS environment and were unfamiliar with using a mouse (Eteaching92). At one stage, initial computer skills training felt akin to being a sports instructor in that students needed to practise how to hold and manipulate a mouse accurately. In the mid 1990s it was still appropriate to state, as a learning objective for a module within an MBA programme, that students should gain experience in using IT. (Community97, WebLessons99) By 2000 it was the norm for students to be very confident users of the Internet, to an extent which introduced a new set of challenges in developing their information literacy skills: in particular, sometimes they were so wedded to particular approaches to searching and navigating the Internet that this hampered their ability to use the professional bibliographic services available in an academic environment. Library staff at the university reported the need for students to 'un-learn the Google effect' of simply typing in a whole string of keywords, as this was a good strategy when using the Google search engine but a weaker one when using specialised bibliographic databases (InfoLiteracy03)

- The constituent papers focus on experience of teaching both undergraduate and postgraduate students at Cass Business School (formerly City University Business School). However the concepts applied here are also relevant to learning by managers in business, and in-service learning offers more practical opportunities for ICT to add value. (TechTeach97) Notably, it allows managers to dip into learning materials at their own pace without leaving their desks, or to have access to those materials when they are travelling. The continuing change in learners' response to technology applies to managers at work as much as to university-based students.

- One very significant way in which ICT can add value – and the key to answering the research question above – is by offering new scope for students to reflect on their learning. This is possible partly by introducing new virtual communities which straddle

traditional boundaries – for instance through international collaboration – but also by allowing students to build up a repository of knowledge where they can all draw on their collective knowledge. ICT also offers new ways to move away from a didactic approach to teaching, for example by allowing them to raise particular issues in electronic discussion groups, or to browse a wide variety of resources on the Internet. To be effective in exploiting this, students need to operate as reflective practitioners, and be prepared to question the issues that are put to them. The literature on knowledge management in business draws explicitly on the more established literature on reflective practice (Argyris, 1999), and knowledge management has entered the popular vocabulary of business in the period covered by the constituent papers (Leonard, 1995; Davenport, 2000). ICT offers considerable scope to capture the tacit dimension in knowledge, and one goal for applications of ICT in learning is to foster the development of tacit knowledge among both students and educators.

- Students' responses to innovative approaches to learning vary considerably, and are a function partly of the students' preferences (which could be described, for example, by the Myers-Briggs type indicator) but also by their adopted learning strategy. Note that the Myers-Briggs type is thought to be innate: for instance if you were born an ENTP, you will always be an ENTP (Myers, 1980), whereas an individual's learning strategy is influenced by many different factors, and one person's favoured learning strategy can vary considerably according to the context. The term learning *strategy* rather than learning *style* is used here deliberately to acknowledge that learning strategies are not innate to an individual (Grasha, 1996; Honey and Mumford, 1992; Pask, 1976).

- In the mid-1990s one discussion point raised with students at the Business School was whether connectivity on the Internet (that is, how many people had access to it) was more important than capacity (that is, how much data could be sent or received to a particular node). The suggestion was that *at that stage* connectivity was more important (GroupWork94). It is worth reviewing whether in 2003 this still holds true. At least for the group relevant to the work here, connectivity is now a given: people in employment, and business students, can get some sort of access to the Internet more-or-less as a matter of course (InfoLiteracy03). In fact the only problems with connectivity

experienced by Cass students in recent years have been created by over-zealous firewalls, which have sometimes made it impossible for students who are also in employment to reach the necessary learning materials from their desks. However capacity is more of an issue than might have been predicted, and Internet users frequently complain about slow responses. Partly this is the result of applications which make very heavy use of the available bandwidth. But it is also a reflection on the use of the Internet to download software, which connects with a further characteristic of the Internet – its extensibility, in other words the ability to add new services to it simply by downloading software. And this is perhaps the most important characteristic behind the continuing importance of the Internet.

The work here has focused on understanding, and not on measuring the benefits of ICT in management learning. To measure these benefits would take this research into the realm of measuring intangibles (Kaplan and Norton, 1994; PRISM 2003) and is beyond the scope of this work. However there are considerable opportunities for further research, by applying these principles of measuring intangibles, to the contribution of ICT to learning discussed here.

Nevertheless, one lesson of the personal journey described here is the impossibility of predicting the future, and the risk associated with making firm plans based on forecasts about technological development. In the spirit of writing this paper as a reflective process, these two practical illustrations have been extracted from the experience of writing the PhD integrating paper:

- In producing the paper, and particularly in seeking relevant literature, electronic resources have been invaluable. Archives of many scholarly journals are held electronically, and electronic citation indices such as *web of knowledge* provide powerful tools to aid navigation of literature, which were not available in the early 1990s. This has direct consequences for the sort of learning resources that universities will need in the future

- E-mail, and both asynchronous and synchronous computer conferencing systems, have become popular to an extent that an impartial observer would not have predicted during the 1990s. While the potential of such systems was apparent, and is acknowledged in the constituent papers, they were accompanied by a popular image – technology-focused, dominated by young, male, technologically confident (and often socially awkward) users – that one might have expected to hamper their universal use.

There is little evidence to support any slackening in this pace of innovation, and a final thought is that future research needs to be flexible and responsive enough to deal with unexpected developments. The toughest challenges for management learning in the future may well be ones that cannot be foreseen at all at present.

REFERENCES:

- Abbott C (2002): Writing the visual: the use of graphic symbols in onscreen texts, in I Snyder (Ed) *Silicon literacies: communication, innovation and education in the electronic age*. London: Routledge.
- Ackoff R L (1994): *The democratic corporation*. Oxford: Oxford University Press.
- Ackoff R L (1989): From data to wisdom. *Journal of applied systems analysis*. 16 (1) 3-9
- Alavi M and Leidner D (2001): Knowledge management and knowledge management systems: conceptual foundations and research issues. *MIS quarterly* 25 (1) 107-136.
- Alexander C, Ishikawa S and Silverstein M (1977): *A pattern language – towns, buildings, construction*. Oxford: Oxford University Press.
- Archer S (1988) qualitative research and the epistemological problems of the management disciplines, in A Pettigrew, (Ed): *Competitiveness and the management process*. Oxford, Blackwell.
- Argyris C (1999): *On organisational learning* (2nd edition). Oxford: Blackwell.
- Argyris C (2000): *Flawed advice and the management trap*. Oxford: Oxford University Press
- Argyris C, Putnam R and Smith D M: *Action science. Concepts, methods and skills for research and development*. San Francisco: Jossey-Bass, 1985
- Aristotle (2002): *Nicomachean ethics: translation, introduction, and commentary* (C Rowe and S Broadie, translated and edited). Oxford: Oxford University Press.
- Ashby W R (1956): *An Introduction to cybernetics*. London: Chapman and Hall.

Baker, A C, Jensen P J, and Kolb D A (2002): *Conversational learning – an experiential approach to knowledge creation*. New York: Quorum Books.

Baskerville R L and Wood-Harper A T (2002): A critical perspective on action research as a method for information systems research, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.

Bawden D (2001): Information and digital literacies: a review of concepts. *Journal of documentation* 57 (2) 218-259.

Beer S (1974): *Designing freedom*. Chichester: Wiley.

Beer S (1975): *Platform for change*. Chichester: Wiley.

Bellinger G (1997): *Knowledge management – emerging perspectives* retrieved 2 January 2004 from <http://www.systems-thinking.org/kmgmt/kmgmt.htm>

Bernstein R J: *The Restructuring of Social and Political Theory*. London: Methuen, 1976

Boisot M H (1998): *Knowledge assets: securing competitive advantage in the information economy*. Oxford, Oxford University Press,

Boje D (2001): *Narrative methods for organisational and communication research*. London: Sage.

Bonwell C C, and Eison J (1991): *Active learning: creating excitement in the classroom* ASHE-ERIC research document, Washington: George Washington University..

Brightman H and Bhada Y (2000): Course materials for Master Teacher Program. Atlanta: Georgia State University.

Brown J S and Duguid P (2000): *The social life of information*. Boston: Harvard Business School Press

Bruce C (1997): *The seven faces of information literacy*. Adelaide: AUSLIB press.

- Bruner J (1996): *The culture of education*. Boston: Harvard University Press.
- Castells M (2000): *The rise of the network society*. (2nd Edition) Oxford: Blackwell.
- Castells M and P Hall (1994): *Techonpoles of the world. The making of 21st century industrial complexes*. London: Routledge.
- Checkland, P and S Howell (1998): *Information, systems and information systems*. Chichester: Wiley.
- Christensen, C M (1997): *The innovator's dilemma*. Boston: Harvard Business School Press.
- City University (1992): COMMDATA proposal to the University Funding Council.
- City University (2003): *Research studies handbook* retrieved 5 December, 2003 from <http://www.city.ac.uk/researchstudies/contents.htm>
- City University (2002): Ordinance C2.2
- Claxton C S and Murrell P H (1987). *Learning styles: implications for improving educational practices*. ASHE-ERIC research document, Washington: George Washington University.
- Cohen C, Manion L and Morrison K (2000): *Research methods in education*. London: Routledge.
- Collis B (2003): *E-learning: what can higher ed and the corporate sector learn from each other?* Paper presented at E-learn 2003 conference, Phoenix AZ, USA .
- Collis B and J Moonen (2001): *Flexible learning in a digital world*. London: Kogan Page.
- Collins H: (2002, 7 June) Science adds up for big softies. *Times higher education supplement*.

Contu A, Grey C and Ortenblad A (2003): Against learning. *Human relations* 56 (8) 931-952.

Coyle D (1999): *The weightless world*. Oxford: Capstone.

Crainger S and D Dearlove (1998): *Gravy Training: Inside the World's Best Business Schools*. Oxford: Capstone.

Cross R and L Baird (2000): Technology is not enough: improving performance by building organizational memory. *Sloan management review* 41 (3) 69-78.

Csikszentmihalyi M (2002): *Flow the classic work on how to achieve happiness in work and play* (2nd edition). London: Rider.

Cuthell J P (2002). *Virtual learning: the impact of ICT on the way young people work and learn*. Aldershot: Ashgate.

Daniel, C (2001, 3 October): Lord Weinstock's baby. *Financial Times*,.

Davenport T and L Prusak (2000): *Working knowledge: how organizations manage what they know* (2nd edition). Boston: Harvard Business School press.

Dadds M and S Hart (2002): *Doing practitioner research differently*, London: Routledge Falmer.

Dearing R (1997): *Higher education in the learning society. National committee of inquiry into higher education*. HM stationery office.

DfES (Department for Education and Skills) (2003): *Towards a unified e-learning strategy* retrieved 2 January 2004 from <http://www.dfes.gov.uk/consultations2/16/>

Easterby-Smith M, Thorpe R and Lowe A (2002): *Management research: an introduction* (2nd edition). London: Sage.

- Easterby-Smith M, R Thorpe and D Holman (1996). Using repertory grids in management. *Journal of European industrial training* 20 (3) 3-30.
- Edvinsson L (2002): *Corporate longitude: what you need to know to navigate the knowledge economy*. London: Financial Times/Prentice Hall.
- Edwards S L and Bruce C (2003): Reflective Internet searching: an action research model. *The learning organisation* 9 (4) 180-188.
- Eisenhardt K M (1989): Building theories from case study research. *Academy of management review* 14 (4) 532-550,
- Elton L (2001): Research and teaching: conditions for a positive link. *Teaching in higher education* 6 (1) 43-56
- Entwistle N J (1987): *Understanding classroom learning*. London: Hodder and Stoughton.
- Espejo R, Shuhmann W, Schwaninger M, and Bilello U (1996): *Organizational transformation and learning: a cybernetic approach to management*. Chichester: Wiley.
- Feldman C F (2000): The sociability of meaning: Olson's interpretive community, in Astington J E, (Ed). *Minds in the making*. Oxford: Blackwell.
- Fleming N: *VAR K – a guide to learning styles* retrieved 23 December 2003 from <http://www.vark-learn.com/english/index.asp>
- Flyvbjerg B (2001): *Making social science matter: why social inquiry fails and how it can succeed again*. Cambridge: Cambridge University Press.
- Forest, J J F (2002): *I prefer to teach*. London: Routledge Falmer.
- Fransella F, Bell R and Bannister D (2004): *A manual for repertory grid technique*. (2nd edition) Chichester: Wiley.
- Gant, P (2003): Personal communication.

- Gibbons M (1996): *What kind of university?* Melbourne: Victoria University of Technology
- Gibbons M, Limoges C, Nowotny H, Schwartzman S, Scott P, and Trow M (1994): *The new production of knowledge: the dynamics of science and research in contemporary societies.* London: Sage.
- Gilster P (1997): *Digital literacy*, Chichester: Wiley.
- Gold M (1999). *The complete social scientist. A Kurt Lewin reader.* Washington: American Psychological Association.
- Golden-Biddle K and Locke K (1997): *Composing qualitative research.* London: Sage.
- Goold M, and Campbell A (1987): *Strategies and styles*, Oxford: Blackwell.
- Grasha A F (1996): *Teaching with style.* Claremont CA: Alliance Publishers,
- Gregorc A F (1982): *An adult's guide to style.* Columbia CT: Gregorc Associates.
- Grenier R and Metes G (1992). *Enterprise networking: working together apart..* Lowell, MA: Digital Press.
- Gummesson E: *Qualitative methods in management research.* (2nd edition). London: Sage, 2000.
- Habermas, J (1987): *Knowledge and human interests* (J J Shapiro translated). Cambridge: Polity Press
- Harasim L (1990): Online Education: an environment for education and intellectual amplification, in Harasim L, (Ed): *Online education: perspectives on a new environment.* New York, Praeger
- Hart S (1995): Action-in-reflection. *Educational action research*, 3 (2) 211-232

- Harvey L J and M D Myers (2002): Scholarship and practice: the contribution of ethnographic research methods to bridging the gap, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.
- Hawkridge D, Newton W and Hall C (1988): *Computers in company training*. London: Croom Helm.
- Hendriks P H J (2001): Many rivers to cross: from ICT to knowledge management systems. *Journal of information technology*, 16 (2) 57-72.
- Holsapple C W and Whinston A B (1996): *Decision support systems: a knowledge-based approach*. St Paul MN: West.
- Honey P: *The Learning Series*. retrieved 11 December, 2003 from <http://www.peterhoney.com/learning/>
- Honey P and A Mumford (1992): *The manual of learning styles*. Maidenhead: Peter Honey.
- Hult M and S A Lennung (1980): Towards a definition of action research: a note and bibliography. *Journal of management studies* 17: 241-250.
- Harvey L J and M D Myers (2002): Scholarship and practice: the contribution of ethnographic research methods to bridging the gap, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.
- Hiltz S R and M Turoff (1993): *The network nation: human communication via computer*. (2nd edition) Cambridge MA: MIT press
- Hudson L (1966): *Contrary imaginations: a psychological study of the english schoolboy*. London: Penguin.
- Hunt, B (2002, 28 May): Brave face in a troubled sector. *Financial Times*
- Jenkins A, Breen R, and Lindsay R with Brew A (2003): *Reshaping higher education: linking teaching with research*. London: Kogan Page

- Jung C G (1989): *psychological types*. London: Routledge.
- Kaplan H and D Norton (1994): *The balanced scorecard*. Boston: Harvard Business School Press.
- Kaye A R (1992): Learning Together Apart, in Kay A R, (Ed): *Collaborative Learning through Computer Conferencing – The Najaden Papers*. Berlin, Springer-Verlag.
- Katz D and R L Kahn (1978): *The social psychology of organisations* (2nd edition). Chichester: Wiley.
- Kelly G A (1955): *The psychology of personal constructs*. New York: Norton,
- Kiesler S and Sproull L (1987): Social process of technological change in organisations, in S Kiesler and L Sproull (Eds): *Computing and change on campus*. Cambridge, Cambridge University Press.
- Kirby P (1979): *Cognitive style, learning style, and transfer skill acquisition*. Columbus OH: Ohio State University.
- Kirton M J (1994): A theory of cognitive style, in Kirton M J (Ed): *Adaptors and innovators: styles of creativity and problem solving*. London: Routledge,
- Knight P T (2002). *Small-scale research: pragmatic inquiry in social science and the caring professions*. London: Sage.
- Kolb, D A (1984): *Experiential learning*. Englewood Cliffs, NJ: Prentice-Hall,
- Lanham R A (1995, September): Digital literacy. *Scientific American*.
- Laurillard D (2001): *Rethinking university teaching: a framework for the effective use of educational technology*. (2nd edition). London: Routledge.
- Lave J and E Wenger (1991): *Situated learning: legitimate peripheral participation*. Cambridge: Cambridge University Press.

Leonard D (1995): *Wellsprings of knowledge*. Boston: Harvard Business School Press.

Leonard D and Swap W (1999): *When sparks fly: igniting creativity in groups*.
Maidenhead: McGraw-Hill.

Lewin K (1997): *Resolving social conflicts and field theory in social science*. Washington:
American Psychological Association (original work published 1948 and 1951)

Light G and Cox R (2001): *Learning and teaching in higher education. The reflective
professional*. London: Paul Chapman.

Lipman M (1991): *Thinking in education*. Cambridge: Cambridge University Press

Loevinger J with Blasi A (1976). *Ego development*. San Francisco: Jossey-Bass.

Lynch K and Carr S (1990): Where learning happens, in T Banerjee and M
Southworth (Eds): *City sense and city design. Writings and projects of Kevin Lynch*.
Cambridge MA: MIT Press.

McCreary E (1989): Computer-mediated communication and organisational
culture, in R Mason and A Kaye (Eds): *Mindware – communication, computers, and
distance education*. Oxford, Pergamon.

Mann R D (1970): *The College Classroom*. Chichester: Wiley.

March J G (1987): Old colleges, new technology, in S Kiesler and L Sproull, (Eds):
Computing and change on campus. Cambridge, Cambridge University Press

Marton F, Hounsell D and Entwistle N (1997): *The experience of learning: implications
for teaching and studying in higher education*. Edinburgh: Scottish Academic Press.

Miles M B, and Huberman A M (1994): *Qualitative data analysis: an expanded
sourcebook*. London: Sage.

Mitchell W J (1995): *City of bits*. Cambridge MA: MIT Press,

- Morecroft J (1999): Visualising and rehearsing strategy. *Business strategy review* 10 (3) 17-32.
- Moore G (1965): Cramming more components onto integrated circuits. *Electronics* 38 (8)
- Mumford A (1995). *Learning at the top*. Maidenhead: McGraw-Hill.
- Mumford L (1966): *The city in history*. London, Penguin
- Myers I B and Myers P (1980): *Gifts Differing*. Palo Alto CA: Consulting psychologists' press.
- Myers M D and Avison D (2002): An introduction to qualitative research in information systems, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.
- Nonaka I and Takeuchi H (1995): *The knowledge-creating company*. Oxford: Oxford University Press.
- Norman R (2001). *Reframing business: when the map changes the landscape*. Chichester: Wiley.
- Olson D R (1994): *The World on Paper: the conceptual and cognitive implications of writing and reading*. Cambridge: Cambridge University Press.
- Orlikowski W J and Iacono S (2001): Research commentary: desperately seeking the 'IT' in IT research – a call to theorizing the IT artifact. *Information systems research* 12 (2) 121-134
- Orlikowski W J and Baroudi J J (2002): Studying information systems in organisations: research approaches and methods, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.
- Papert, S (1993): *Mindstorms: children, computers and powerful ideas*. (2nd edition) Brighton: Harvester Wheatsheaf

Pask G (1975): *The cybernetics of human learning and performance*. London: Hutchinson.

Pask G (1976): Styles and strategies of learning. *British journal of educational psychology* 46 (2) 128-148.

Pask G and Curran S (1982): *Microman: living and growing with computers*. London: Century Publishing.

Penzias A (1995): *Harmony: business, technology and life after paperwork*. London: HarperCollins.

Pick R A and Schell G P: An architecture for knowledge management featuring metaknowledge, in C Holsapple, V Jacob and H R Rao: *Business modelling: multidisciplinary approaches*. Dordrecht: Kluwer, 2002

Polanyi M (1967): *The tacit dimension*. London: Routledge and Kegan Paul,

Polkinghorne D E (1988): *Narrative knowing and the human sciences*. Albany NY: State University of New York Press.

PRISM (2003): About PRISM. Retrieved 2 January 2004 from <http://www.euintangibles.net/about>

Quah D (2003): Digital goods and the new economy, in D Jones (Ed) *New economy handbook*, Elsevier.

Rainbow, S W, and E Sadler-Smith (2003): Attitudes to computer-assisted learning among business and management students. *British journal of educational technology* 34 (5) 615-624.

Ramsden P (2003): *Learning to teach in higher education* (2nd edition). London: RoutledgeFalmer.

Remenyi D, Williams B, Money A and Swartz E (1998): *Doing research in business and management*. London: Sage.

Revans, R W (1998). *ABC of action learning* (3rd edition). London: Lemos and Crane.

Richardson, J T E (2000). *Researching student learning: approaches to studying in campus-based and distance education*. Buckingham: Open University Press.

Rogers, R R (2001): Reflection in higher education: a concept analysis. *Innovative higher education* 26 (1) 37-57.

Ross J and R Schulz (1999): Can computer-aided instruction accommodate all learners equally? *British journal of educational technology* 30 (1) 5-24.

Salmon P (1992): *Chieving a PhD – ten students' experience*. Stoke on Trent: Trentham Books,

Schein E H (1987): *The clinical perspective in fieldwork*. *Sage university paper series on qualitative research methods* no 5. London, Sage.

Schön D (1971): *Beyond the stable state*. London: Maurice Temple Smith.

Schön D: (1988): *E ducating the reflective practitioner*. San Francisco: Jossey-Bass.

Schön D (1986): *The design studio*. London: RIBA publications,

Schön D (1991): *The reflective practitioner*. Aldershot: Avebury. (originally published in UK by Maurice Temple Smith, 1983)

Schön D, W D Drake and R I Miller: *Social experimentation as reflection-in-action* *Knowledge: creation, diffusion, utilization* 6 (1), 1984

Schwiller J (1999): Personal Communication,

Searle, J R (1969): *Speech acts: an essay in the philosophy of language*. Cambridge: Cambridge University Press.

Selwyn N (2002): *Telling tales on technology: qualitative studies of technology and education*. Aldershot: Ashgate.

- Senge P (1992): *The fifth discipline*. London: Century Business.
- Shields, R (1996) *Cultures of Internet: virtual space, real histories, living bodies*. London: Sage.
- Skyrme D (2001): *Capitalizing on knowledge from e-business to k-business*. London: Butterworth-Heinemann.
- Smith, M. K. (2001) Donald Schön: learning, reflection and change, retrieved 30 December 2003 from *the encyclopaedia of informal education*, at www.infed.org/thinkers/et-schon.htm
- Sproull L and S Kiesler (1991). *Connections: new ways of working in the networked organisation*. Cambridge MA: MIT press.
- Stewart V and A Stewart (1981). *Business applications of repertory grid*. Maidenhead: McGraw-Hill.
- Stusser I (2002). *The Castells reader on cities and social theory*. Oxford, Blackwell.
- Sumsion J (2000): Facilitating reflection: a cautionary account. *Reflective practice* 1 (2) 199-214.
- Syrret M and J Lammiman (2000): Happily landed. *People management* 6 (19).
- Tiffin J, and L Rajasingham (1995): *In search of the virtual class*. London: Routledge.
- Tsai, S-H (2001): *Features of english in CMC and their implications for language learning*. Unpublished PhD thesis, Institute of Education, London,
- Usability First (2002): Groupware links retrieved 11 December 2003 from <http://www.usabilityfirst.com/groupware/cscw.txt>
- Van Baalen PJ and Moratis L (2001): *Management education in the network economy – its context, content and organisation*. Dordrecht: Kluwer.

- Van der Veer R and Valsiner J (1991): *Understanding Vygotsky*, Oxford: Blackwell.
- Vasquez Bronfman S (2001): *Linking active learning methods and information technology to enhance business education*. Presentation at EDINEB conference.
- Walsham G (2002): Interpretive case studies in IS research, in M D Myers and D Avison (Eds): *Qualitative research in information systems, a reader*. London: Sage.
- Weatherall A and Nunamaker J (1996): *Getting results from electronic meetings*.
Chandlers Ford: Electronic Meeting Solutions Ltd
- Wenger E (1998): *Communities of practice: learning, meaning and identity*. Cambridge: Cambridge University Press.
- Wiener N (1989): *The human use of human beings: cybernetics and society*. Free Association.
- Winograd T (1987): A language/action perspective on the design of cooperative work *human-computer interaction* 3(1) 3-30. Also retrieved 31 December 2003 from <http://hci.stanford.edu/~winograd/papers/language-action.html>
- Winograd T and Flores F (1986): *Understanding computers and cognition: a new foundation for design*. Norwood NJ, Ablex,
- Wray R (2003, 8 May): Marconi tries to win hearts. *Guardian*.
- Zuboff S (1988): *In the age of the smart machine*. London: Heinemann.

Appendix 1:

Glossary

Definitions of some names and abbreviations used in the submission are given below for convenience

BPR	Business process re-engineering
Cass Business School	New name (since 2002) for the business school at City University
CAL	Computer assisted learning
CBT	Computer based training
CMC	Computer mediated conferencing
CSCW	Computer supported collaborative work
ICT	Information and communication technology
IT	Information technology
Trent Engineering	Case study used as the basis for a collaborative learning project for MBA students at City University

Appendix 2:

Statements from
co-authors



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A School of City University London
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28 January 2004

Dear Mr Martin

I have been asked to comment on the contribution of my colleague and co-author Mr Martin Rich to the following papers:

Holtham, Clive and Rich, Martin (1997) "Learning information systems through a mail-enabled business simulation: the case of Trent Engineering" in Lloyd, Les: Technology and Teaching. Information today inc. 1997. 139-156

This paper drew particularly on Martin's in-depth work on the Trent case study, combined with my more general knowledge of the background to the use of IT and simulations in management education. We each drafted material about our relevant areas but collaborated on producing the complete paper.

Holtham, Clive and Rich, Martin (2001) "Barriers to academic take up of computer mediated communications and video technologies – the comfort factor" technology in education and training (TET) Prague, May 2001

I took the lead in drafting this paper, but both Martin and I contributed examples and synthesised the research findings from the paper. We presented it jointly at the conference in Prague.

Holtham, Clive; Murphy, Ciaran, and Rich, Martin (2002) "Business information systems: can relevance link teaching and learning to research?" Scholarship of teaching and learning (SOTL) conference, London, June 2002

This was a fully collaborative effort which, drew on both Martin's experience and mine, in linking teaching and research, together with supporting ideas from Professor Ciaran Murphy of University College Cork. Martin and I jointly presented this paper at the SOTL conference in London, and we also ran a workshop for academic staff at City University based around the paper.

Holtham, Clive and Rich, Martin (2002) "Making space for twenty first century management learning" Educational Innovation in Economics and Business (EDINEB 2002), Guadalajara, June 2002



I led on drafting this paper, and presented it at the EDINEB conference, but both my ideas and Martin ideas were formative in writing the paper, and he had been personally involved over a long period of time in developing with me the underlying thinking reflected in the paper.

Rich, Martin; Brown, Ann, and Holtham, Clive (2003) "Information literacy for starting MBAs: issues and dynamics" Business Education Support Team (BEST) conference, Brighton, April 2003

Brown, Ann; Rich, Martin, and Holtham, Clive (2003) "Supporting information literacy for starting MBAs through action research" Electronic journal of business research methods2 (1)

These last two papers are complementary. Martin took the lead in drafting one of these papers and Ann Brown in the other, and I contributed to the ideas used in both of them. Martin undertook most of the empirical work used in these papers.

All of these papers are the result of collaborative research to which Martin, I, and other co-authors contributed. In almost all cases Martin and I would closely collaborate early on in some depth on the purpose, themes and structure of the paper.

They constitute a consistent body of work around the theme of management education and they all draw on Martin's analysis and insight, in most cases very heavily. Martin's contribution to each paper was significant, and they collectively represent scholarship on his part of a standard consistent with the City PhD regulations for academic staff. Therefore I would, as co-author, support all of these papers being put forward as part of Martin's PhD submission.

Yours sincerely

A handwritten signature in black ink, appearing to read 'Clive Holtham', with a long horizontal flourish extending to the right.

Clive Holtham



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**Ms. Frances Owen,
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A School of City University London
Formerly City University Business School

December 23, 2003

Dear Ms. Owen,

I have been asked to comment on the contribution of my colleague Mr. Martin Rich to the two papers, that we co-authored:

Ann Brown, Martin Rich and Clive Holtham 'Supporting Information Literacy for starting MBAs through Action Research' Electronic Journal of Business Research Methods, vol (2) issue 1 August 2003 at <http://www.ejbrm.com>

Martin Rich, Ann Brown and Clive Holtham 'Information Literacy for starting MBAs – issues and dynamics' proceedings of BEST (Business Education Support Team), April 2003 also at <http://www.business.ltsn.ac.uk/events/BEST%202003/List%20of%20papers.htm>

The two papers draw on material from the same case study, but use it for different purposes. The two papers are complementary.

It is not always easy to be precise about the respective contributions of the main authors to the papers. The papers were fully collaborative pieces of work by Martin and myself with each of us taking the lead in drafting one paper – myself for the first and Martin for the second. Martin undertook most of the empirical work that was used in each paper. Our third co-author, Clive Holtham contributed to shaping the ideas behind each paper.

Therefore, it is entirely appropriate that one or both of these papers can be used to substantiate the Ph.D. thesis of Martin Rich.

Yours sincerely

**Ann Brown, BSc, MSc
Senior Lecturer, Cass Business School**

