How and why collaborative and learning behaviours influence strategic organisational innovation: a mixed methods study in the UK tertiary education sector.

by

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Declaration of Originality

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Summary

The primary research question explores the influence of collaboration on strategic organisational innovation. At the organisational level, innovation is seen as crucial for successful performance and to being able to adapt to changing circumstances: and with the rise of globalisation and the information society, collaboration is seen as one of the major catalysts for achieving innovation. Existing evidence shows a positive relationship between collaboration and innovation, but is almost entirely quantitative, with weak measures, and rarely focuses on the public sector. The secondary research question explores alternative theories for why innovation decisions are made – organisational learning versus institutional conforming. The context for this thesis is the UK tertiary education sector.

This thesis adopts a mixed methods approach. The quantitative research aims to be uniquely robust, with multi-item operationalisation of collaboration and innovation. The qualitative research adopts a specially developed innovation journey framework, which enables underlying processes and decisions to be investigated. The survey questionnaire was sent to 133 universities and 300 FE colleges with a demographically representative 36.5% response rate. Three universities and two FE colleges participated in the case study, with four senior managers being interviewed in each institution. 31 strategic innovations were studied in depth.

Both the quantitative survey and qualitative case study confirm a strong relationship between collaboration and innovation. In addition, this thesis includes in-depth analyses of the nature of collaboration and innovation, including the organisational impact and contribution to corporate objectives of emergent innovation types and the functional mechanisms and output contributions of emergent collaborator types. There is practical advice to government policy makers and to senior managers in the sector - differentiating between eclectic collaboration aimed at identifying opportunities and purposive collaboration aimed at working with key players to enact new strategies and optimise operational performance. Complementing the above research, this thesis uniquely compares two prominent schools of thought – organisational learning and institutional theory – and provides a detailed explanation as to why the former was found to be far more pre-dominant as a basis for individual innovation decisions, although most innovations belong in some sense to generic sector norms.

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I would also like to extend my warm gratitude to Wendy, my long-suffering thesis widow.

Abbreviations

Sector abbreviations

TES	Tertiary Education Sector
FE	Further Education
HE	Higher Education

Key concepts defined in this thesis

SIB	Strategic Innovative Behaviour
CB	Collaborative Behaviour
OL	Organisational Learning
IC	Institutional Conforming

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CHAPTER ONE

INTRODUCTION

1.1 FORMULATION OF RESEARCH QUESTION 1 (RQ1)

1.1.1 Organisational innovation and its enablers

Innovation is at the heart of this research. At the organisational level, innovation is seen as crucial for successful performance (Teece, 2010), competitive advantage (Tushman & Anderson, 2004; Tidd et al, 2005) and survival (Glor, 2015); and, at the national level, it is seen as "a key driver of UK growth and economic prosperity" (Department of Business, Innovation and Skills, 2014, p.3). The specific focus in this research is strategic organisational innovation. This author develops the following definition in Section 2.2: "Strategic organisational innovation is any change to an organisation's products/ services, processes and/or organisational characteristics, which is new to the organisation, which aims to provide a corporate benefit, and which is important enough to be discussed by the senior management team."

Early research into organisational innovation stemmed from the contingency theories of authors such as Burns & Stalker (1961) and Lawrence & Lorsch (1967), who proposed that an organisation's optimum strategy is dependent on its external environment. This led to work on the major influences of organisational innovation, typically examining four factors: leadership, including individual traits and behaviours; organisational characteristics, including size and structural complexity; the environment, including the level of competition and the economic situation (Corwin, 1972; Baldridge & Burnham, 1975); plus the type of innovation itself. Factor analysis research has continued to this day, as evidenced by notable meta-analyses by Damanpour (1987, 1991, 1996 and 2010).

1.1.2 The relevance of collaboration to organisational innovation

The idea of a specific link between collaboration and innovation arose in the 80's and 90's. With the rise of rapid technological advances (Utterback, 1994), globalisation (Archibugi & Iammarino, 1999), the information society (Webster, 2014) and supply chain management (Porter, 1985), inter-organisational networking became seen as a major catalyst for achieving innovation and performance goals (Miles & Snow, 1992). There were two key benefits. Firstly, formal collaboration with external partners can be more efficient than loose market-based arrangements and more flexible than hierarchical ownership arrangements (Williamson, 1981). Secondly, collaboration provides access to complementary know-how/ competences and complementary resources/ assets (Teece, 1998). Consequent upon the above, there was a change in emphasis in organisational innovation research from factor analysis to process analysis. Central to this process-oriented research was the study of how the development of inter-organisational relationships leads to the development of social capital. This engenders potential opportunities for innovation through the novel combination of complementary, but previously unconnected, partner knowledge stocks (Nahapiet & Ghoshal, 1998; Tsai & Ghoshal, 1998). According to Nahapiet & Ghoshal (1985), social capital has three major elements: the structure of the network ties between organisations (Granovetter, 1973; Burt, 2004); the compatibility of the mental models and narratives between organisations (Nooteboom et al, 2007) and inter-organisational trust (Mayer et al, 1995; Dodgson, 1993b). Alongside research into social capital was the equally important research into the actual process of knowledge transfer (Argote & Ingram, 2000a), the capacity to absorb knowledge from other organisations (Cohen & Levinthal, 1990) and research into different forms of collaborative working (Simonin, 1997). Finally, the rapid advance in internet and bio technologies in the 90's, led to a spike in the study of formal organisational alliances (Stuart, 2000).

Research in each one of these specialist facets of collaboration is now very strong and mature, with an accepted body of core theories. Empirical evidence is also strong, albeit predominantly quantitative and in high tech industries: rarely is the empirical evidence qualitative or in the public sector. New research tends to focus on specific angles/ contingencies and to test theories in specialised empirical settings. It is not the purpose of this research to seek to take the exploration of these topics any further.

However, their existing concepts are used extensively to help define the variables in the research models.

More recently, in the 00's and 10's, there has been a huge growth in the availability of corporate digital information and a commensurate growth in national innovation surveys. A particular example is the Community Innovation Survey (CIS), which is organised every two years by the EU through its individual members. These surveys often seek to explore a holistic association between collaboration and innovation or are focussed on identifying which types of collaborative partner, such as customers, suppliers or third parties, have the greatest influence on innovation. The evidence of a relationship between collaboration and innovation is consistently positive. However, this evidence is almost entirely quantitative, and the operational measures are generally weak, often consisting of simplistic binary yes/ no indicators. Additionally, there is a scarcity of qualitative studies, and especially a lack of the exploration of decision making through the innovation journey. This means that the question "why" is seldom posed. Finally, because the surveys are aimed at private firms, the consequential research analysis is also exclusively focussed on private firms, mainly in manufacturing sectors, with an absence of analysis in the public sector.

1.1.3 Summary of the problem addressed by RQ1

Earlier in this section, it was established that the relationship between collaboration and innovation is an important topic in management theory and practice. As such, it merits a much more comprehensive and robust approach than has been attempted up until now and, hence, it is the primary research question in this thesis. Specifically, RQ1 addresses the following two problems. Firstly, existing quantitative studies linking collaboration with innovation either are very broad-brush surveys, using very simplistic measures or they are from a rather specialist perspective. We do not have a robust statistic based on the complex operationalisation of collaboration and innovation, nor can we position that relationship statistically vis-à-vis other key organisational and environmental measures, such as organic culture and sector competition. Secondly, there is a dearth of qualitative studies and those that exist, do not address decision making during the innovation journey. Apart from high technology R&D/ supply chain

relationships, we do not know a) how and why organisations collaborate, b) with whom, c) for different types of innovation and d) at different stages of an innovation.

1.1.4 Why focus on the public sector?

The context for this research is the UK public sector. According to Moore (2005) and Hartley et al (2013), innovation in the public sector is under-theorised and under-researched compared with the private sector. This is borne out by two of the classes of evidence cited in Section 1.1.2. Therefore, this research fills a contextual gap in the empirical evidence base. The public sector is important, firstly, because it is almost as large in size as the private sector (Koch et al, 2006; OECD, 2016). Government spending for OECD countries as a % of GDP in 2015 ranged from 29% to 57% (OECD, 2018). For the UK, the % in 2015 was 42% and for the period 1997 to 2015, it ranged from a low of 36% in 1997 to a high of 48% in 2009 and 2010 (Trading Economics, 2018). In 2015, the 42% is split between 24% on operational services and the remaining 18% on pension, welfare and interest payments (Trading Economics, 2018). Thus, a sizeable proportion of UK public expenditure is potentially susceptible to operational innovation.

A second reason for choosing the public sector is because it has a different environment and a different set of issues compared with the private sector. Traditionally, there are several reasons why the public sector has not been thought of as being as innovative as the private sector. Firstly, the external environment is seen to lack strong market competition (Halvorsen et al, 2005). Secondly, there is weak corporate direction engendered by multiple stakeholders with contradictory agendas – this includes unhelpful interference from politicians (Naschold, 1996). Thirdly, there is a lack of resources – for example, reliance on centrally allocated annual capital and revenue budgets (Naschold, 1996) and poor R&D facilities (Mulgan, 2014). Fourthly, leadership is believed to be bureaucratic and risk averse (Heffron, 1989). Finally, the public sector is believed to have an inherently lower level of productivity than the private sector (OECD, 2017). Because of these issues, there is no shortage of organisations such the OECD (internationally) and NESTA (within the UK) who have developed policies and toolkits which aim to improve public sector innovation. These are motivated by the need to cope with an ever-growing demand for public services,

coupled with complex demographic issues and climate change, all whilst having to operate under tight fiscal constraints (OECD, 2016).

The third reason for choosing the public sector is because over the past 30 years, two models of public innovation strategy have been pre-dominant – new public management and organisational entrepreneurship (Hartley et al, 2013), and several writers have recently proposed that the time is ripe to augment, or replace, these two existing models with a new model of public innovation strategy based on greater external collaboration (Eggers & Singh, 2009; Bommert, 2010; Sorensen & Torfing, 2011; Hartley et al, 2013).

The first existing model, new public management, claims that the public sector could be more innovative by adopting market-based competition structures and private sector management cultures and techniques (Osborne & Gaebler, 1992). In practice, such reforms have been useful in replacing the traditional emphasis on bureaucratic rules by an emphasis on outcomes (Bryson et al, 2010). They have also engendered user driven changes to public services and more consumer choice (Jaeger, 2013). On the other hand, the introduction of performance targets, set by politicians, and league tables have tended to distort management behaviours (Andrews et al, 2008). The encouragement of competition has also discouraged inter-organisational learning and co-operation (Rashman et al, 2009). On the whole, new public management is appropriate where there is a need to improve efficiency through rolling out "best" practice, and is rather poor where there is a need to create and implement "next" practice (Hartley et al, 2013).

The second existing model, organisational entrepreneurship, is based on transformational leadership and the replacement of a control-based performance management style by one which encourages the empowerment of front line managers and trusts them to apply their know-how and skills (Hartley et al, 2013). This model is good at enhancing service quality and being responsive to user demands for new services, eg e-government (Hartley et al, 2013). However, in this model, the primary source of innovative ideas is inside the organisation and thus organisational entrepreneurship fails to realise fully the potential of extra-organisational actors as a source of innovative ideas (Hartley et al, 2013).

The new collaborative innovation model emphasises co-operation rather than competition (Warmer, 2016) and highlights the beneficial role of external multi-actor engagement in each of the stages of the innovation cycle (Bommert, 2010; Hartley et al, 2013) – for example: in framing complex problems using actors with different experiences and perspectives; in selecting an optimal solution, given the choice of several solutions tested by diverse actors; in a more robust implementation, given diverse sources of skills and resources; and a greater utilisation/ diffusion when collaborators become the champions of new practices (Bommert, 2010; Hartley et al, 2013). According to Borins (2001), in a US public innovation national award programme, 60% of innovations were created through inter-organisational collaboration. Resolving the two research questions in this thesis would be a small first step in providing partial evidence for assessing the relative merits of new public management, organisational entrepreneurship and collaborative innovation.

The public sector includes several distinct public services which have many of the features of private firms, in that there is an operational, customer-oriented service provided by a semi-autonomous organisation. Education is an example of such a public service, which, in the UK, represents 5% of GDP (Trading Economics, 2018). The specific context for this thesis is the UK tertiary education sector (TES), consisting of universities and FE colleges. These are fairly large organisations which are responsible for post-school education and training and are financed primarily by a mix of public funding and customer fees. TES has specifically been chosen because it has many operational features similar to those found in private firms and because the sector has rarely been studied in an innovation context. In fact, there has only been one comprehensive study of innovation in the UK TES, by Hannan & Silver (2000).

1.1.5 Statement of RQ1

The primary RQ is:
How and why does collaboration influence strategic organisational innovation?

The relationship between collaboration and innovation is well researched. This thesis fills gaps in existing theoretical research in three ways. Firstly, existing research either

takes a holistic approach using very simplistic definitions or examines specialised angles of collaboration or innovation in depth. This thesis is both holistic and incorporates broad definitions of collaboration and innovation. Secondly, existing research is almost entirely quantitative. This research is a mixed methods approach, exploring both the big picture and underlying decision making. Thirdly, existing research is mainly concerned with the private sector. This thesis is focussed on the public sector, which is also economically and socially very important.

1.1.6 The practical importance of RQ1

As well as the theoretical and empirical importance to academics, this thesis is also of potential value to two sorts of practitioner, particularly in the UK TES. Firstly, it can be useful to policy makers, in evaluating whether they should be specifically encouraging collaboration and, if so, what form of collaboration, how they should be enacting such encouragement and what the benefits would be. Secondly, it can be useful to senior managers in universities and FE colleges in helping them to evaluate how useful collaboration might be as a strategic policy, what form such collaboration should take and with whom and what the benefits would be.

1.2 FORMULATION OF RESEARCH QUESTION 2 (RQ2)

1.2.1 Comparing organisational learning and institutional conforming theories

Central to the concept of collaboration are the processes of scanning for opportunities, knowledge transfer and the evaluation, integration and exploitation of new knowledge. Essentially, this is the basis of the theory of organisational learning (Crossan et al, 2011; Easterby-Smith, 2011). The motivational driver is to implement opportunities that optimise technical efficiency with the ulterior purpose being survival. The theory of organisational learning arose in the 80's and has its roots in contingency theory. However, as a reaction against contingency theory, neo-institutional theory (Meyer & Rowan, 1977; DiMaggio & Powell, 1983; Scott, 2014) also emerged in the 80's. This theory proposes that organisations adopt an innovation, not to enhance technical performance, but because it is believed to be perceived by stakeholders to represent the legitimate business practice in their sector. (To match the grammatical structure of

organisational learning, institutional theory is called institutional conforming in this thesis). Organisational learning and institutional conforming both purport to explain, in very different ways, why organisations decide to innovate. The two schools of thought can be compared in two dimensions – firstly, how is an innovation justified, and secondly, what is the behaviour during the innovation journey.

Dealing firstly with how an innovation is justified, the driver for organisational learning is for an organisation to adapt to its environment and to improve its technical efficiency (Fiol & Lyles, 1985; Dodgson, 1993). Evidence would be the existence of a business case (Boardman et al, 2011). The driver for institutional conforming is for an organisation to enhance its legitimacy with stakeholders (Suchman, 1995). Evidence would be compliance with coercive government regulations (DiMaggio & Powell, 1983), or with mimetic pressures to follow leading competitors (Haunschild & Miner, 1997) or with normative pressures to follow sector norms (Scott, 2014). Regarding behaviour, organisational learning is about how to arrive at solutions tailored to the specific needs of a specific organisation, whereas institutional conforming is about implementing solutions which are sector standards. Organisation learning behaviour has three distinguishing characteristics, each highly proactive. These are: scanning externally for opportunities (Huber, 1991); a continual monitoring – reflection – adjustment feedback cycle (March & Olsen, 1975; Argyris & Schon, 1978); and sensemaking through open participation (Edmondson, 1999). Institutional conforming behaviour is essentially reactive with an absence of organisational learning behaviours.

1.2.2 Summary of the problem addressed by RQ2

Up until now, these two schools of thought have been explored in two separate research streams, and have never been compared empirically. This thesis aims to rectify this and hence the secondary research question. Specifically, it addresses the following two problems. Firstly, we do not know statistically whether organisational learning or institutional conforming influence strategic organisational innovation more. Secondly, we do not know which of the characteristics of organisational learning versus institutional conforming, as differentiated in Section 1.2.1, are more in evidence during the innovation journey, and why.

1.2.3 Statement of RQ2

The secondary RQ is:
Which of organisational learning and institutional conforming influences strategic organisational innovation more, and why?

Organisational learning and neo-institutional theory (the basis for institutional conforming) are two very prominent management theories. Each theory purports to explain why organisations decide to innovate, but the explanations are radically different. This thesis fills gaps in existing theoretical research in three ways. Firstly, it distils the essences of and compares the two theories and seeks to explore which one, in practice, influences organisational innovation more than the other. Secondly, existing research in each field is mainly quantitative. This research is a mixed methods approach, exploring both the big picture and underlying decision making. Thirdly, existing research is mainly concerned with the private sector. This thesis is focussed on the public sector.

1.2.4 The practical importance of RQ2

RQ2 has exactly the same contextual setting as RQ1, ie the UK TES. This research question also has practical value to both policy makers and senior managers. With regard to both, it would give a greater contextual awareness of how organisational decisions are made. More specifically, it could influence policy makers in how they should frame potential benefits, discretionary funding and implementation support and could encourage senior managers to analyse the effects of legitimacy and performance pressures in respect of each innovation.

1.3 RESEARCH QUESTIONS AND RESEARCH OBJECTIVES

The research questions were identified in the preceding section as:

1. How and why does collaboration influence strategic organisational innovation?
2. Which of organisational learning and institutional conforming influences strategic organisational innovation more, and why?

These research questions are now broken down into detailed research objectives. These have formed the basis for the detailed research and, consequently, the basis for the presentation of research findings later in this thesis. In all, there are 10 research objectives, numbered RO1 – RO10. These research objectives address the behaviour of organisations and, hence, strategic organisational innovation is termed strategic innovative behaviour (SIB) and collaboration is termed collaborative behaviour (CB).

The primary structure of the research objectives reflects the two research questions and two distinct methodological perspectives – one quantitative and one qualitative. This gives the following four research objectives:

	Quantitative approach	Qualitative approach
Research Question 1	RO2 To identify whether collaborative behaviour influences strategic innovative behaviour.	RO4 To explore how and why collaborative behaviour influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.
Research Question 2	RO6 To identify whether organisational learning or institutional conforming influences strategic innovative behaviour more.	RO8 To explore which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why.

The research objectives associated with Research Question 1 are rather holistic. A more fine-grained approach would give greater insight into underlying phenomena. The most powerful insight into the nature of collaboration is provided by identifying

whether different collaborator types differentially influence organisational innovation. This is the purpose of two further research objectives.

	Quantitative approach	Qualitative approach
Research Question 1 - additional fine-grained research objectives	RO3 To examine whether collaborator type differentially influences strategic innovative behaviour.	RO5 To explore how and why each collaborator type influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

There are four further research objectives. The most important is a preparatory research objective, which explores the nature of strategic innovative behaviour and is a necessary first step to approaching each of the above research objectives. This is also interesting information in its own right and can be used to develop interesting analyses. This research objective applies to both the quantitative and qualitative approach.

	Quantitative approach	Qualitative approach
Preparatory research objective.	RO1 To explore the nature of strategic innovative behaviour.	

The second of the further research objectives attempts to evaluate collaboration as a source of innovation concepts vis-à-vis the two other major theoretical sources of innovation concepts, ie internally generated concepts and non-collaborative awareness of well-known industry solutions. Thus, this research objective seeks to position collaboration in the overall scheme of organisational innovation. It applies to both the quantitative and qualitative approach.

	Quantitative approach	Qualitative approach
Positioning research objective.	RO10 To examine where joint internal/ external collaboration is positioned as a source of innovation concepts, compared with mainly internally generated sources and mainly externally generated sources.	

The final two research objectives are spin-offs from the data required for the above research objectives. One research objective seeks a statistical model that positions collaborative behaviour amongst the other independent variables (including organisational learning, institutional conforming and various organisational/ environmental control variables) that might influence the dependent variable, strategic innovative behaviour. The other research objective, mirrors RO6, except in evaluating the comparative influence of organisational learning versus institutional conforming on collaborative behaviour rather than on strategic innovative behaviour. These research objectives apply only to the quantitative approach.

	Quantitative approach
Statistical modelling research objective	RO10 Using the results from Research Objectives 2 and 6, to develop a statistical model that identifies the relative contributions made by the key independent variables in influencing strategic innovative behaviour.
Research objective concerning influences on collaborative behaviour	RO7 To identify whether organisational learning or institutional conforming influences collaborative behaviour more.

1.4 RESEARCH METHODOLOGY

Two perspectives are sought. Firstly, there is the big picture – the overall state of play in the given population of organisations. This perspective is provided by a quantitative survey. The second perspective considers deeper questions of how and why and explores underlying decision making during the innovation journey. This perspective is provided by qualitative case study interviews. This mixed methods approach has methodological advantages in that if the findings from two such differing research methods are mutually corroborative, then such findings are more robust. The two methods also have differing strengths in terms of reliability and validity. In addition, in this thesis, results from the survey were used to inform the design of the case study.

The survey was conducted in 2010 and consisted of a questionnaire survey sent to 133 UK universities and 300 UK FE colleges. Overall, there was a 36.5% response rate, with an excellent demographic match with the total population on six distinct attributes. This gives confidence that the findings in the volunteered sample can be generalised to the whole population, thus providing the required big picture perspective. The case study was conducted in 2012 and 2013 and consisted of 20 interviews with the senior managers of three universities and two FE colleges selected on the basis of their size, geographical spread, high value added, high widening participation and a high reputed innovation performance. The case study explored 31 strategic organisational innovations in depth across 10 distinct innovation categories. The seniority, background and enthusiasm for the research displayed by the interviewees together with the sound methodological approach, ensured that interesting and relevant insights emerged concerning decision making during the innovation journey.

1.5 THE CONTRIBUTIONS MADE BY THIS RESEARCH

Although existing empirical evidence shows a positive relationship between collaboration and innovation, this evidence is almost entirely quantitative with weak measures and the context is almost entirely in high tech sectors. The quantitative research in this thesis aims to be as robust as is possible, with multi-item operationalisation of collaboration and innovation and the incorporation of organisational and environmental controls. Distinctively, this thesis also includes qualitative research, using a specially developed innovation journey framework, which has enabled underlying processes and reasons for decisions to be investigated. Thus, this research provides a robust mixed methods confirmation of the positive influence that collaboration has on strategic organisational innovation, and a detailed insight into the respective roles and contributions to innovation made by specific collaborator types, particularly within the UK TES. This granular analysis of collaboration types is new to the TES and provides a most useful categorisation of collaboration, relevant to both eclectic and purposive collaboration, and provides both theoretical and practical insight.

Complementing the above research, is the unique idea to compare the relative prevalence of two prominent schools of thought – organisational learning and

institutional theory – in an innovation context. In both the survey and the case study, the characteristics of organisational learning were pre-dominant compared with the characteristics of institutional conforming. It is opined that this is because there is much more information available nowadays to assess performance, both by senior managers within organisations and by external stakeholders. This is not to say that there is no longer any uncertainty, rather that in most circumstances, most of the time, the role of myths is trumped by rational analysis. Notwithstanding this conclusion, the data could also be argued to demonstrate that every innovation belongs to one of several generic categories of innovation types, and that in some sense each of these supra generic categories are sector norms.

This study is primarily concerned with theories about innovation, collaboration, organisational learning and institutional conforming. The UK TES is simply a vehicle for analysis. Nevertheless, this study, especially the case study, provides a rich picture of the nature and relevance of strategic organisational innovation and collaboration in the UK TES, including the organisational impact and contribution to corporate objectives of emergent innovation types and the functional mechanisms and output contributions of emergent collaborator types.

Also, specific to the UK TES, this research provides practical advice to government policy makers concerning support for innovation in the UK TES and advice to senior managers in the sector. The role of government was found to be much more than merely the paymaster. The breadth and depth of support is impressive. It could be argued that without the direction and/ or funding and/ or support from various arms of government, most of the innovations described in this thesis would not have got off the ground. Nevertheless, there is criticism of the government's inconsistent policies and lack of strategic direction in the FE sector. With regard to practitioners, although leadership was not a specific focus, it emerged that most of the innovations in this thesis were triggered by someone in the senior management team, often by the CEO themselves. Collaboration was seen to play two important roles. "Purposive" collaboration is crucial in both implementing new strategies and in meeting key performance targets. It involves having a targeted plan of action aimed at specific external players. "Eclectic" collaboration is associated with spotting opportunities. It involves routine and ad hoc networking at industry and sector meeting groups. The

serendipitous nature of this type of collaboration requires judgement by managers in the use of their time.

Finally, this research has also led to other spin-off contributions. In respect of methodology, there have been the development of robust concepts in respect of an innovation space, strategic organisational innovation and an innovation journey framework. There has also been the development of embryonic new categorisations from the data – in respect of the justification criteria for organisational innovation and in respect of collaborator/ innovator management styles

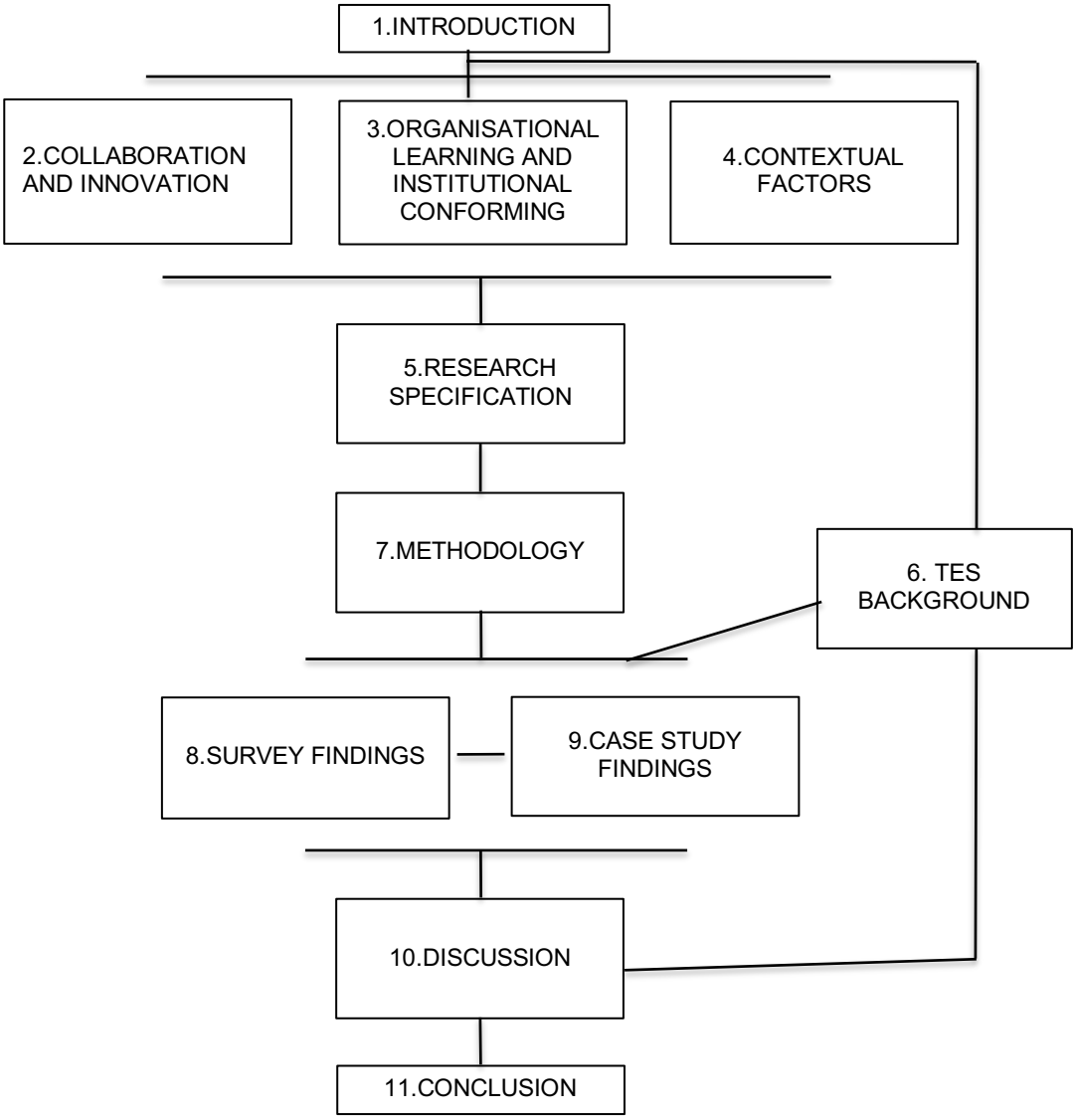
1.6 CHAPTER CONFIGURATION

Figure 1.1 overleaf depicts the thesis chapter configuration.

There are three chapters covering the literature review. Chapter 2 specifically concerns RQ1. It scopes and defines strategic organisational innovation and develops an innovation journey framework for use in data gathering and data analysis. It then goes on to explore six themes associating collaboration with innovation, before justifying in depth RQ1 and the associated detailed research objectives. Chapter 3 specifically justifies in depth RQ2 and the associated research objectives. It goes on to scope and distil the concepts of organisational learning and institutional conforming. Chapter 4 justifies the controls for use in the survey and the background organisational and environmental theory relevant to conducting the case study. Chapter 5 brings all the research questions and research objectives together and explains relevant nuances in the use of specific terms. It also develops research models for both the survey and the case study and specifies how organisational learning can be differentiated from institutional conforming. Chapter 6 provides background information regarding innovation in the UK public sector and the UK TES in particular. It also discusses the one major study concerning innovation in the UK TES by Hannan & Silver (2000). Chapter 7 is an in-depth description and justification for the research philosophy, for the research design and for the respective detailed design and conduct of the survey and the case study. This includes how the research concepts are operationalised in the questionnaire and how interview questions are formulated for use in the case study. Chapter 8 concerns the survey findings. It justifies the credibility of the findings and

then presents the findings under the headings of each relevant research objective, using univariate, covariate and multivariate statistics as appropriate. Chapter 9 concerns the case study findings. It describes and analyses the 31 innovations that emerged, describes and analyses the role and contribution made by the eight collaborator types that emerged and analyses each of the innovations in terms of whether they can each be characterised as being motivated by organisational learning or institutional conforming. Chapter 10 discusses the overall contributions made by the thesis, including an in-depth analysis of the theory relating to the two research questions. It also discusses the practical benefits of the research to TES policy makers and TES senior managers. Finally, it introduces two new categorisations, in respect of innovation justification criteria and collaborator/ innovator management styles. Chapter 11 discusses the strengths and limitations of the thesis, including issues concerning conceptual definitions, the measurement of concepts and the interpretation of findings. It also suggests opportunities for future research.

Figure 1.1 Thesis chapter configuration



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CHAPTER TWO

COLLABORATION AND INNOVATION

2.1 INTRODUCTION TO THE LITERATURE REVIEW

The literature review, consists of Chapters Two, Three and Four, and explores comprehensively, systematically and critically the main theories and empirical evidence relating to the research questions. Important and interesting opportunities for new research are identified, covering both theoretical content and methodical approach. From these opportunities, outline research objectives are proposed, which are formalised and consolidated in Chapter 5 – Research Specification. Thus the new research is positioned within existing related research.

Chapter Two is at the heart of this research and considers Research Question 1 – How and why does collaboration influence strategic organisational innovation? It begins with the scoping/ definition of organisational innovation, followed by a discussion and specification of a template for a typical innovation journey. This template is used as a vehicle for analysis in the qualitative research. The remainder of this chapter consists of a systematic analysis of theories and empirical evidence in the literature which link collaboration with organisational innovation. Three themes are explored: a cause-effect relationship between collaboration and innovation, collaborative processes and collaborative structures. The final section develops specific research objectives.

2.2 THE DEFINITION AND SCOPE OF ORGANISATIONAL INNOVATION

2.2.1 Introduction

This thesis concerns an organisation adopting an innovation. Hence, the term that is used is organisational innovation and the primary unit of analysis is the organisation (Damanpour, 1991). This distinguishes the scope from diffusion, which concerns the spread of an innovation in a potential population of users, where the unit of measure is an innovation (Rogers, 2010); social innovation, which concerns public service innovation at the societal level, where the unit of analysis is social change (Voorberg et al (2015); and national innovation systems, which concern institutions that enable innovation, where the unit of analysis is a country (Nelson, 1993). Although the primary unit of analysis is the organisation, for the purposes of more fine-grained analysis, this thesis explores specific innovations, or innovation types, within an organisation.

2.2.2 Definitions of organisational innovation

In order to clarify the interpretation of innovation as used in this thesis, it is useful to consider examples of the definition of innovation proposed by notable authors. Table 2.1, overleaf, lists several examples. In the table, each of the definitions is split into three parts so that they can be systematically compared. The first part is the action by the prime organisation, the second is the object of the action and the third is the intended benefit.

Table 2.1 Examples of the definition of innovation by notable authors			
Author	Action by prime organisation	Object of the action	Intended benefit
Zaltman & Lin (1971, p.656/7)	The adoption…	of any idea, practice or material artifact perceived to be new by the unit of adoption	
Rowe & Boise (1974, p.285) (defining organisational innovation)	The successful utilization……introduced as a result of decisions made within an organisation	of processes, programs or products which are new to an organisation	"successful"
Damanpour & Evan (1984, p.393)	The implementation…	of an internally generated or borrowed idea – whether pertaining to a product, device, system, process, policy or service - that is new to the organisation at the time of adoption	
Drucker (1985, p.19)	The exploitation…	of change as an opportunity for a different business or service	
Kanter (1988, p.170)	The creation and exploitation…	of new ideas	
DTI (2004, p.web Home Page)	The successful exploitation…	of new ideas	"successful"
Mulgan & Albury (2003, p.3) (defining successful innovation)	The creation and implementation…	of new processes, products, services and methods	…which results in significant improvements in outcomes, efficiency, effectiveness or quality

Table 2.1 Examples of the definition of innovation by notable authors			
Author	Action by prime organisation	Object of the action	Intended benefit
OECD (2005, paras. 146 & 150)	The implementation……	…….of a new or significantly improved product (good or service), or process, a new marketing method, or a new organisational method in business practices, workplace organisation or external relations. A new or improved product is implemented when it is introduced on the market. New processes, marketing methods or organisational methods are implemented when they are brought into actual use in the firm's operations.	"significantly improved"
Damanpour & Wischnevsky (2006, p.271)	The development and use…	of new ideas or behaviours in organisations. A new idea could be a new product, service, method of production (technical innovation) or a new market, organisational structure, administrative system (administrative or organisational innovation)	
Birkinshaw et al (2008, p.825) (defining management innovation)	The generation and implementation…	of a management practice, process, structure or technique that is new to the state of the art	…and is intended to further operational goals
Bloch & Bugge (2013, p.143) (defining organisational innovation for the MEPIN project)	The implementation…	of a new method for organising or managing work that differs significantly from existing methods in an organisation. This includes new or significant improvements to management systems or workplace organisation.	"significant improvements"
Grant (2016, p.243)	The initial commercialization…by producing and marketing…or using	an invention or a new product or service …or new method of production	
Innabarometer (2016, p.4)	Innovation occurs when a company introduces…	a new or significantly improved good, service, process, marketing strategy or organisational method. The innovation can be developed by the company itself or has been originally developed by other companies or organisations.	

(Source = Author)

With regard to the first part of the definition, the action by the prime organisation, specific key words can be identified. These are set out in Table 2.2.

Table 2.2 List of key words representing organisational action related to innovation

Key word	Authors
Creation	Kanter, 1988; Mulgan & Albury, 2003
Generation	Birkinshaw et al, 2008
Development	Damanpour & Wischnevsky, 2006
Adoption	Zaltman & Lin, 1971
Introduction	Rowe & Boise, 1974; Innabarometer, 2016
Implementation	Damanpour & Evan, 1984; Mulgan & Albury, 2003; OECD, 2005: Birkinshaw et al, 2008; Bloch & Bugge, 2013
Utilisation	Rowe & Boise, 1974
Use	Damanpour & Wischnevsky, 2006; Grant, 2016
Exploitation	Drucker, 1985; Kanter, 1988; DTI, 2004
Commercialisation	Grant , 2016

Source=Author

These key words infer a clear interpretation by the respective authors of the scope of the primary innovating organisation. The following is this author's analysis of the meaning of these key words. Creation and generation imply the invention of something new – ie an innovation that is new to the state of the art, and one that has never been implemented anywhere else before. This omits innovations that are simply new to the adopting organisation, ie innovations they have copied from elsewhere. It is possible for innovations to be in a grey area – for an organisation may borrow an idea or embryonic innovation and develop it themselves into a full-blown innovation. Development implies an organisation working on an innovation, that it has invented or acquired, until it is ready for exploitation. Adoption, introduction and implementation are generic terms implying an organisation has started using an innovation. None of these terms infer how it was sourced. Implementation can also include the process of the organisation getting ready for the innovation. Utilisation and use mean the innovation is now part of the organisation's working operations. Exploitation means both using the innovation internally or selling it for commercial gain, while

commercialization and putting on the market mean only selling the innovation for commercial gain.

Turning to the second column, the subject matter of the innovation, there are two relevant points to note. Firstly, each definition uses a form of words which effectively clarifies the scope of the innovation subject matter. There are three basic subject areas, covering respectively: products or services sold; delivery processes; and organisational matters (Damanpour, 1991; OECD, 2005). (These are discussed in Section 2.2.2.1.) Only three of the definitions (Damanpour & Wischnevsky, 2006; OECD, 2005; Innabarometer, 2016) include all three subject areas. It is possibly no coincidence that these include the definitions by the two supra-national bodies. Three definitions do not mention any of the three basic subject areas at all, but refer simply to ideas. This does indicate the rather wide scope of the theoretical material on innovation. The second point of interest concerning the second column is the authors' respective interpretations of new. Of the 13 definitions, all except one, mentions new: the odd one out simply mentions change. In three of the definitions, new is defined as new to the organisation; in two of the definitions, new is defined as new to the state of art; and in seven of the definitions, the meaning of new is not clarified.

Turning to the final column, benefit to the organisation, it can be observed that several of the definition entries are blank. This is because these definitions do not directly or indirectly mention benefit in any form. The definitions most directly citing a benefit are those of Birkinshaw et al (2008), who state the benefit to be "to further operational goals" and Mulgan & Albury (2003), OECD (2005) and Bloch & Bugge (2013) who use the term "significantly improved". Two other definitions imply benefits by using the word "successful" in the definition.

These definitions raise several interesting points that can be used to clarify the scope or interpretation of innovation in this thesis. Firstly, as one suspects that few organisational innovations can be defined truly as new to the state of the art, the adoption of such a definition would exclude the vast majority of organisational innovation. Consequently, this thesis adopts the definition of new to the adopting organisation. This definition is also adopted by the Community Innovation Survey

(organised by the European Commission). Secondly, there is the question as to whether only innovation for internal use and/or only for external sale are included. Both these types of innovation are included in this thesis as this is compatible with including both product and process/organisational innovations. Thirdly, this thesis proposes to include consideration of the benefits of organisational innovation to the host organisation. This does not extend to a detailed analysis of consequential improvements to performance, but it does include whether the process of innovation has been successful and whether the innovation is perceived to yield positive business benefits. In order to not limit the scope, or learning, by only including successful innovations, this thesis includes all innovations, whether successful or not and whether the benefits have yet accrued or not, provided there was an intention of corporate benefit. Fourthly, the analysis of the first column implied a sequential innovation process – starting with the invention or acquisition of an idea or innovation; followed by the internal development of the idea or innovation so that it can be ready for organisational use or sale as a new or modified service; and finally ending with the exploitation of the innovation by internal use or external sale. This introduces the idea of an innovation journey which is explored in Section 2.3.

2.2.3 The scope of organisational innovation

The previous section stated that the scope of an innovation can consist of three basic subject areas: products or services sold; delivery processes; and organisational matters. This functional categorisation is just one perspective of innovation scope. Two important other perspectives are the scale distinction between radical and incremental innovations (Dewar & Dutton, 1986) and the scoping distinction between stand-alone and architectural innovations (Henderson & Clark, 1980). All three perspectives are now dealt with in detail.

2.2.3.1 Functional categories of innovation

Damanpour (1991) carried out a major and often cited meta-analysis concerning the effects of the determinants and moderators of organisational innovation. As part of this analysis, Damanpour (1991) broadly specified the functional categories of

organisational innovation in terms of three innovation types – product and service innovation; process innovation, including product technology; and administrative innovations, including organisation structure and administrative processes. Damanpour's (1991) categories emphasise a technological/ administrative split. A slightly different emphasis has been taken by the OECD and the European Commission, whose aim, in defining categories, is to compile consistent national statistics of innovation. The OECD (2005) category definitions are specified in the Oslo Manual 3rd edition and are given below.

"A **product innovation** is the introduction of a good or service that is new or significantly improved with respect to its characteristics or intended uses. This includes significant improvements in technical specifications, components and materials, incorporated software, user friendliness or other functional characteristics." (OECD / Eurostat, 2005, p.48)

"A **process innovation** is the implementation of a new or significantly improved production or delivery method. This includes significant changes in techniques, equipment and/or software." (OECD / Eurostat, 2005, p.49)

"A **marketing innovation** is the implementation of a new marketing method involving significant changes in product design or packaging, product placement, product promotion or pricing." (OECD / Eurostat, 2005, p.49)

"An **organisational innovation** is the implementation of a new organisational method in the firm's business practices, workplace organisation or external relations." (OECD / Eurostat, 2005, p.51)

The Community Innovation Survey (CIS) concerns collaboration and innovation and is organised every two years by the EU through its individual members. The CIS follows the OECD innovation category definitions. There have been many analyses of the data, a recent example being Bujidos-Casado et al (2017). The design of the CIS survey questionnaire is a major input into the design of the survey questionnaire used in the quantitative analysis in this research.

The OECD and CIS statistics are concerned with the analysis of private sector firms: their category definitions have not been designed for use in the public sector (Hartley, 2006; Gault, 2016). Hartley's (2006) response is to propose additional subject areas, such as new public services, new public goals, new forms of citizen engagement and new rhetoric. These subject areas are more relevant to central government policy innovation than to organisational innovation by individual public service organisations, such as universities and FE colleges. Accordingly, they have not been taken up in this thesis. Table 2.3 summarises how Damanpour (1991) and the OECD/ Eurostat (2005) categorise the subject matter of organisational innovation and also sets out the proposed categorisation for use in this thesis.

Table 2.3 Categorisation of the subject matter of organisational innovation

Subject Matter	Damanpour categories (1991)	OECD/ Eurostat Categories (2005)	Categories used in this thesis
Product/Service	Product/Service	Product/ Service	Product/ Service
Production Process	Process	Process	Process
Administrative Process	Administrative	Process	Process
Marketing (changes to product / pricing)	Not specified	Marketing	Product/ Service
Marketing (changes to processes)	Not specified	Marketing	Process
Organisation Structure	Administrative	Organisation	Organisation

Source = Author

The OECD approach has less of a technological emphasis than that of Damanpour. Also, it splits administrative topics between administrative process and organisation structure elements and adds the cross-cutting subject of marketing. CIS surveys use the OECD categories. However, in practice, in the CIS surveys, there is a far greater emphasis on the product/ service and process categories than the marketing and organisation categories. In this thesis, it is proposed to utilise a mix of the Damanpour and OECD approaches. This thesis proposes to retain the major differentiation between product/ service and process, as found in both Damanpour and OECD categorisations. In addition, the third category concerning organisation structure, found in the OECD approach, is also retained as it highly relevant to the public sector.

However, the OECD marketing category is not retained. It is barely used in CIS surveys and analyses of results and is not so relevant, in an innovation context, to the tertiary education sector.

The final point to note is that in common with most writers, this thesis uses the term organisational innovation to mean any innovation carried out by an organisation. However, some writers, for example, Bloch & Bugge (2013) for their MEPIN project, restrict the definition to "the implementation of a new method for organising or managing work" (p.143), which in this thesis, and indeed in the OECD categorisation, is the subject matter of only the "organisation" category.

2.2.3.2 Scale categories of innovation

The most common scale distinction is between incremental and radical innovation (Ettlie et al, 1984: Dewar & Dutton, 1986; Nord & Tucker, 1987; Damanpour, 1991). Dewar & Dutton (1986) describe incremental innovations as "minor improvements or simple adjustments in current technology" (p.1423) and radical innovations as "fundamental changes that represent revolutionary changes in technology. They represent clear departures from existing practice." (p.1422). They say that the difference is the extent of new knowledge or technology embodied in the innovation. They go on to say that there is a continuum of innovations that range from radical to incremental and that to assign the category incremental or radical would need a very robust metric and even then, it would be arbitrary. In practice, most empirical studies rely on the intuitive assessment of experts in the field (Dewar & Dutton, 1986). Although Dewar & Dutton's language often relates to technology or working practice, the terms radical and incremental are also commonly used to describe scale changes in products, processes and organisation. Other terms used in the literature that are similar to the intent of being radical are major, fundamental, transformational, revolutionary and discontinuous. Allied to the distinction between an innovation being incremental or radical is the consequential impact on organisational competences. Innovations may be competence enhancing, or competence destroying and/or require new competences (Gatignon et al 2002).

Incremental and radical innovation are very different in terms of the nature of the change itself, the process of change and the impact on performance. Including both types in this thesis would significantly increase its scope and therefore only one category is proposed. It is preferable to have a definition that involves more than the minor changes that are included in incremental innovation and yet is not restricted to the rare transformational changes inferred by radical innovation. It is proposed to use the term strategic innovative change. The term strategic implies a change that is significant to the adopting organisation, and so the change may be radical, but it also may be a significant incremental change. In order to define strategic innovative change so that it can be understood by participants in this research and readers of the results, it is proposed to define strategic innovative change to be any change that is discussed by the senior management team.

2.2.3.3 Architectural categories of innovation

In any analysis of organisational innovation, it is important to be aware that innovations are not always stand-alone, but may be part of a framework or series of innovations. One approach that takes this into consideration is the categorization developed by Henderson & Clark (1980). They are particularly concerned with complex manufactured products and differentiate between the components of the product and the architecture that links these components together. Their four-category model for product innovation, is set out in Table 2.4:

Table 2.4 An architectural model of innovation

Architectural linkages	Core concepts	
	Re-enforced	Overturned
Unchanged	Incremental Innovation	Modular Innovation
Changed	Architectural Innovation	Radical Innovation

Source: Henderson & Clark (1980)

It is useful to understand whether Henderson and Clark's (1980) approach could apply to a tertiary education situation. The following example demonstrates that it could apply. A conventional campus university has the components of a portfolio of courses each with their own schema, lecturers, study facilities and materials and so on. Let us

say that a lecturer updates the study materials. This would be an incremental innovation. However, let us say that this component is now obtained from a specialist outside source instead of the lecturer creating the material. This would be a modular innovation. Now let us say that the original course components are reconfigured for distance learning. This would be an architectural innovation. Finally, let us consider a series of courses developed for a specific employer. Not only would the architecture be completely different but so too would most of the components. The course schema would be tailored to the employer's requirements; much of the teaching and learning could be on the job; and the mode of assessment could take the form of competence assessment rather than formal examination. This would be a radical innovation and therefore would require considerably more effort and, indeed, organisational change.

2.2.4 Definition of strategic organisational innovation used in this thesis

Consequent upon the above discussions, this thesis uses the term strategic organisational innovation, which is defined as follows:

"Strategic organisational innovation is any change to an organisation's products/ services, processes and/or organisational characteristics, which is new to the organisation, which aims to provide a corporate benefit, and which is important enough to be discussed by the senior management team."

2.3 THE INNOVATION JOURNEY

2.3.1 Development of a generic framework

The innovation journey is the process undertaken by an organisation in implementing an innovation (Cheng, Y. & Van de Ven, 1996; Van de Ven et al, 2008; Van de Ven, 2017). In this section, the Author has developed a generic framework for this innovation journey derived from an analysis of several models in the literature and an analysis of the detailed tasks involved during the innovation process (Sections 2.3.3, 2.3.4 and 2.3.5). The framework covers from the moment a need for change is identified, through the identification and selection of candidate solutions, the

harmonious development of the innovation, any changes to the organisation to make it ready and finally the utilisation, realisation of benefits, reflection and continuous improvement. The purpose is to provide a simple template for study participants to understand and talk about the innovation journey and to provide a structured and robust approach for the analysis of qualitative data. The framework consists of a series of innovation journey stages together with a description of the nature of the tasks and decisions that may be made during that stage. The framework is based on the eight innovation process models set out in Table 2.5. The framework has three distinct phases – initiation, development and exploitation. This split into three phases highlights two turning points – the crucial formal decision to go ahead with investing in development and the equally crucial formal decision to start using the innovation in live operations.

Some patterns are apparent from an analysis of the models in Table 2.5. In all models, there is a first phase which begins with the generation of ideas and/ or the recognition of opportunities. There is ambiguity as to whether the concepts for the innovation are derived in-house or externally. In most models, this is followed by a selection process and the evaluation of which options to develop further. A formal decision is needed at this point because the development phase is likely to require considerably more investment of money and time (Van de Ven, 2008). In most models, the next phase is the design and development of a new product or service and tangible organisational change. Again, typically, there is ambiguity as to how much of the development is carried out in-house and how much is out-sourced. For example, the Damanpour & Schneider (2006) model assumes that the concept is developed by a third party and thus their model only includes modifying an innovation. There are two distinct categories of models in the exploitation phase, depending upon whether the innovation primarily focusses on changing internal processes/ organisation (Kanter, 1998; Tidd, 2005; Damanpour & Schneider, 2006; Van de Ven, 2008) or primarily focuses on developing new products/ services for external marketing (Rothwell, 1994; Everleens, 2010; Garud, 2013). In the former case, the processes lead to organisational routinisation and in the latter case lead to the gearing up for production and marketing. The two most detailed models are those of Damanpour & Schneider (2006) and Van de Ven (2008), while those of Kanter (1998) and Tidd (2005) are rather simplistic and generic. Both

Damanpour & Schneider (2006) and Van de Ven (2008) models recognise a distinction between the organisational change starting to be used and it later becoming a routine operation. On balance, in this regard, it is preferable for the turning point for the third phase to be the first act of meaningful live operation. This makes for a clearer break between phases and one that is easier to recognise.

The three phases of initiation, development and exploitation are now described in detail. However, first, the topic of decision making in an innovation context is covered briefly.

2.3.2 Decision making during the innovation journey – general issues

Eisenhardt & Zbaracki (1992) identify three dominant paradigms in strategic decision making – cognitive, political and stochastic, each of which demonstrates inherent challenges. According to Simon (1947, 1991) a lack of knowledge means that decision makers not only do not know the cause-effect relationship of their choices, but they are not even aware of all the choices open to them – this is the famous bounded rationality problem. Secondly, there is often a plurality of agendas and, sometimes, powerful players will tend to dominate (Cyert & March, 1963). Thirdly, there is Cohen et al's (1972) famous garbage can model, in which the starting point are manager's pet solutions for which problems are found, rather than the other way around.

Decision making during the innovation journey is especially challenging because of the contextual complexity. Innovation often means novelty and open-endedness, uncertainty and ambiguity and, because participation often crosses boundaries, achieving a consensus is often difficult (Mintzberg, 1976; Kanter, 1988; Stacey, 1996). According to Van de Ven (2008), the innovation journey rarely starts with a discrete event but with an extended gestation process that can often last several years. Furthermore, the process is not a simple linear one but complex and recursive (Van de Ven, 2008; Birkinshaw et al, 2008) with different organisational units pursuing separate and often divergent paths (Van de Ven, 2008). Setbacks are frequent and assumptions and plans often have to be re-configured (Van de Ven, 2008). Behn (1988) described this process as "management by groping along" (p.643).

Table 2.5 Examples of Innovation process models in the literature

Innovation process models designed to be applicable to …	Phase		
	Initiation	Development	Exploitation
... organisational and product innovation			
Kanter (1998)	1. Idea generation 2. Coalition building	3. Idea realisation (developing a tangible product)	4. Transfer to use
Tidd (2005)	1. Search opportunities/ threats 2. Select in line with corporate strategy	3. Implement (acquire technology and market know-how, execute change, launch and sustain)	
Damanpour & Schneider (2006) – meta-analysis	1. Recognise need 2. Search for solutions 3. Evaluate options 4. Decide on chosen option and allocate resources	5. Modify innovation 6. Prepare organisation for its use	6. Continue operational use until innovation becomes routine
Van de Ven (2008)	1. Initiation (ideas and problems leading to solutions) 2. Proposal submitted for development funds	3. Development work 4. Integration new with old and the beginning of operational use	5. The innovation becomes institutionalised within the organisation
… only product innovation			
Rothwell (1994)	1. New needs and new technologies generates new ideas	2. Research 3. Design and development 4. Prototyping	5. Manufacture and market
Everleens (2010) – meta-analysis	1. Idea generation 2. Select opportunities	3. Develop tangible product and test	4. Launch and market
Garud (2013)	1. Invent	2. Develop	3. Scale up for mass production and marketing

Source=Author

2.3.3 Innovation journey framework – initiation phase

Overall, the factors for a successful initiation stage are a diversity of ideas and a flexible, open approach (Kanter, 1988; Damanpour, 2006). Some organisations have a dynamic entrepreneurial innovation strategy, variously called in the literature "prospectors" (Miles & Snow, 1978), "dynamic capabilities" (Teece et al, 1997), "adhocrats" (Cameron et al, 2016) or "builders" (Makkonen et al, 2016). A key strategic dilemma is whether to explore new possibilities or exploit old certainties (March, 1991).

Perry-Smith & Mannucci (2017) argue that there are four stages of idea development – generation (needing cognitive flexibility), elaboration (needing organisational support), championing (needing influence) and adoption (needing a shared vision). The initial trigger is either an internal performance problem (Birkinshaw et al, 2008; Penide et al, 2013) or an external opportunity (Kanter, 1988; Preez & Louw, 2008; Desouza et al, 2009) or a combination of the two (Van de Ven, 1993; Hargadon, 2003). External ideas can come from scanning the environment (Ota et al, 2013) and from the everyday working routines of boundary spanners (Birkinshaw et al, 2008; Tushman, 1977, 1981), who link internal networks with external networks. Nutt (1984, 2000) conducted two meta-analyses and found that the best way of scanning for innovation opportunities was in two steps - benchmarking against other organisations followed by a finely specified search.

As a result of opportunity scanning, an organisation is likely to have many potentially good ideas. Over time, similar ideas converge and are filtered and refined (Ota et al, 2013; Preez & Louw, 2008). Those with power need to be persuaded to invest in the idea (Van de Ven, 2008) and this often requires coalition building (Kanter, 1988). Experimentation (Birkinshaw et al, 2008) and trialling (Desouza et al. 2009) may be conducted to test aspects of feasibility and efficacy.

Eventually, there needs to be an adoption decision concerning which opportunities to choose among the many alternatives in which to invest money and time. It has become the norm for most sizeable corporate investments to require a business case – including,

inter alia, how the proposed change aligns with the corporate strategy together with an evaluation of options in terms of costs, benefits, risks and implementation plan. It was Chandler (1962) who first highlighted how important a corporate strategy is to large firms and Ansoff (1965) identified that this could be developed using a corporate gap analysis and the identification of product/ market combinations. About the same time, techniques for making decisions in a complex, uncertain and competitive world were emerging under headings such as operations research (Ackoff & Sasieni, 1968) and systems analysis (de Neufville & Stafford 1971). Additionally, various techniques, as found in standard accounting textbooks, were devised for estimating the financial values of investment decisions.

The criteria for assessing whether to adopt an innovation depends on the situational circumstances and the type of innovation. The criteria may include financial performance (Pliskin, 2005; Kennedy & Fiss, 2009); quality performance and customer satisfaction (Pliskin, 2005; Kennedy & Fiss, 2009); efficacy (Pliskin, 2005; Rogers, 2010; TAM*); feasibility/ testability Rogers (2010); reputation (Pliskin, 2006; Kennedy & Fiss, 2009); competitive pressures (Kennedy & Fiss, 2009); organisational alignment – including compatibility with working practices and culture and ease of use (Rogers, 2010; Tornatzky & Klein, 1982; TAM*); and relative advantage compared with other options (Rogers, 2010; Tornatzky & Klein, 1982). (TAM* are technology assessment models, such as those specified by Klein & Sorra (1996), Chau & Hu (2002), Repenning (2002) and Venkatesh et al (2003).

Participation is particularly important in the initiation phase. Ideas generally start with individuals (Woodman, 1993). Internal problems can be recognised at all organisational levels. However, external opportunities are more likely to be recognised by senior managers playing a boundary spanning role. Coalition building is also a people process, where those with decision making powers are persuaded to participate. Finally, in the evaluation of whether to adopt an innovation, future operational managers will play an important role in assessing feasibility.

2.3.4 Innovation journey framework – development phase

The factors for a successful development phase are sufficient resources and commitment (Kanter, 1988; Damanpour, 2006). This phase has two important tasks – to develop the innovation itself and to ensure that the organisation will be ready for live operation.

The design and development of the innovation will typically start with a specification of requirements, to be followed by the design and build (Association of Project Management, 2006). The design and build may be carried out by internal staff or external contractors and there may be the acquisition of components from third party suppliers.

In many cases, a raw concept that is well known in the sector will be developed and tailored to the specific needs of an organisation. Rogers (2010) calls this re-invention and sees several benefits. Firstly, innovations are often conceived at an outline level and are not too prescriptive. This necessarily requires detailed design to be specified at the local level. Secondly, even if innovations are conceived at a detail level, the conditions on which they were based are unlikely to pertain in each local situation, requiring the innovation to be tailored. Finally, thinking about the design of the innovation locally may lead to a generic improvement in the innovation.

As well as tailoring the innovation to fit the organisation, it is equally important to re-design the organisation (ie structures, roles, processes and rules (Rogers, 2010)), to extract maximum benefits from the innovation (Bernstein & Singh, 2006). A lack of fit can cause problems (Hong & Kim, 2002). An example is provided by Southon et al (1997). Their case study describes an attempt to implement a packaged IT system into New South Wales hospitals. Although the package was seemingly well specified functionally, it was a poor organisational fit, compounded by the host environment being fragmented.

Radical change can require radical transformations to the existing organisational design. There are two basic approaches – integrate the new organisational model into

the old one or develop a separate parallel organisation (Westerman et al, 2006). The latter approach may be the only way if new capabilities need to be developed (Christenson & Overdorf, 2000). Both approaches are fraught with cultural problems.

In the development and implementation phases, it will be mainly the future operational managers and staff who will need to participate in innovation and organisational design and in the transition to live operation. A crucial element of this is the training of operational and management staff in order to ensure the organisation is ready (Pisano et al, 2001.

2.3.5 Innovation journey framework – exploitation phase

Exploitation involves integrating and embedding an innovation into the organisation until it is routine and institutionalised (Damanpour, 2006; Van de Ven, 2008). In the case of process and organisational innovation, this means only changes to the production side of the organisation, while in respect of innovative products and services, it means a change to both production and marketing/ sales.

There are two internal dimensions to exploitation - infusion and diffusion. The infusion of an innovation into an organisation is the depth to which all of its features are fully embedded into the organisation's operational systems and culture (Yin, 1981; Zmud & Apple, 1992; Zeitz et al, 1999). The diffusion of an innovation is the extent to which the innovation has spread to the different business units within an organisation (Katz & Khan, 1978; Berta et al, 2005). An example of diffusion, is that the implementation phase may start with a pilot. This is live operation with restricted features of the innovation and/or in just one part of the organisation. The advantages of a pilot are to improve the design and reduce potential problems; to build trust with operatives and customers; and to assess capacity issues (NHS Institute for Innovation and Improvement – Project Management Guide, 2015).

After the innovation is embedded (or terminated), it is usual for post-implementation reviews to be carried out. There are two types. The first concerns benefits realisation management and the second concerns change management. Both are important to

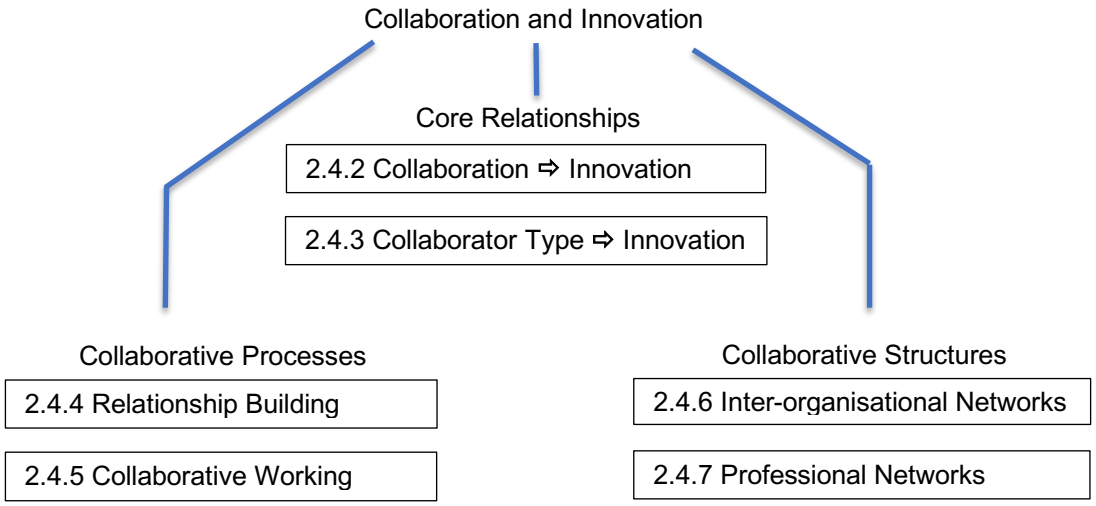
innovation success (Badewi & Shehab, 2016). The purpose of benefits management is to ensure that the potential benefits from an investment are actually achieved (Bradley, 2010), by measuring the benefits after the innovation has been embedded and against those predicted in the business case (Breese, 2011). Strictly speaking, benefits management should be carried out all through the development phase, as well as in the implementation phase. Often, development focuses on tangible deliverables and resources when it should also focus on how benefits will be harvested (Ashhurst et al, 2008). The second kind of review is to reflect on the innovation process, to identify what worked well and what worked not so well – so that lessons can be learned (NHS Institute for Innovation and Improvement, 2015). It is also to celebrate success.

2.4 COLLABORATION AND INNOVATION – THEORIES AND EVIDENCE

2.4.1 Introduction

The heart of this research topic is how collaboration influences innovation. The literature can be structured into six themes, as follows:

Figure 2.1 Structure of theories relating collaboration to innovation



The first two themes specifically explore material seeking to identify a core relationship between collaboration and innovation. The first theme is a holistic perspective and the second theme explores types of collaborator and whether any one type is more influential than another. Collaborator types include supply chain partners, ie customers and suppliers, peer group partners and competitors and research organisations and consultants.

The next two themes concern underlying collaborative processes with regard to innovation. This material takes several specialist perspectives. The first process theme concerns relationship building, which includes the initial and on-going process of developing social capital with partners. According to Nahapiet & Ghoshall (1998), there are three main components of social capital - structural features of a relationship, cognitive compatibility and trust. The second theme concerns collaborative working, which includes those processes which are substantively concerned with innovation, such as knowledge transfer and joint working on development or actual operations.

The final two themes concern collaborative structures with regard to innovation. The first structural theme concerns inter-organisational networks, which includes ad hoc networking inside and outside the supply chain and more formal alliance agreements. The second structural theme concerns professional networking, ie individuals collaborating with other individuals or professional associations on a strictly personal basis, as opposed to representing their organisation in an official capacity.

Existing material in respect of holistic and specific collaborator type relationships with innovation is rather weak, particularly in terms of the methodological approach and the situational context of the empirical evidence. Improving on this research forms the bases for the research objectives specified later in this chapter. On the other hand, many of the specialist concepts, especially those of relationship building, collaborative working and inter-organisational networking have a large body of strong mature theory and supporting empirical evidence and this thesis does not attempt to challenge or improve such theory. However, this specialist material does provide the basis for the detailed specification of constructs for the quantitative research and does provide the essential contextual awareness in order to conduct qualitative research.

2.4.2 Collaboration and innovation – a holistic perspective

This sub-section explores theory and empirical evidence that demonstrates a relationship between collaboration and innovation. In theory, collaboration with external partners can be more efficient than market-based arrangements and offer more flexibility than hierarchical ownership arrangements (Nieto & Santamaria, 2007; Tavasson & Karlsson, 2015). Another benefit is being better positioned to achieve strategic goals (Tidd et al, 1997), primarily achieved through access to complementary know-how/ competences and complementary resources/ assets (Teece, 1986; von Hippel, 1994; Hagedoorn, 1993; Shaw, 1994; Doz & Hamel, 1998; Ahuja, 2000a; Pittaway et al, 2004). Also, national institutions that support networking have been found to enhance innovation (Scott & Jensen, 2016).

Thirteen empirical studies have been found that specifically focus on the relationship between collaboration and organisational innovation. Details of these are set out in Table 2.6 overleaf, in chronological sequence.

Table 2.6 Empirical studies linking collaboration with innovation

Authors	Industry/ Country	Findings	Methodology and measures for innovation and collaboration concepts, respectively.
Love & Roper (1999)	Manufacturing/ UK	Collaboration leads to greater innovation	Quantitative. Innovation = number of products introduced. Collaboration = 7-point indicator
Becker & Dietz (2004)	Manufacturing/ Germany	R&D collaboration leads to greater product innovation. Increases with number of partners.	Quantitative. Innovation = binary. Collaboration = binary
Faems et al (2005)	Manufacturing/ Belgium	Variety of partner types leads to greater innovation	Quantitative. Innovation = extra turnover from new products. Collaboration = 7-point indicator
Amara & Landry (2005)	Manufacturing/ Canada	Collaboration leads to more novel innovation	Quantitative. Innovation = binary. Collaboration = binary
Nieto & Santamaria (2007)	Manufacturing/ Spain	Collaboration leads to greater innovation and increases with diversity of partners	Quantitative. Innovation = binary. Collaboration = binary
Soosay et al (2008)	Logistics/ Australia	Collaboration with customers and suppliers leads to the following innovation related benefits: standardised operations, joint planning, sharing knowledge, sharing processes, joint investing and better synchronisation.	Qualitative
Frenz & Letto-Gillies (2009)	Industrial and services/ UK	Collaboration is not associated with innovation	Quantitative. Innovation = innovative sales per employee. Collaboration = binary
Hsueh et al (2010)	Software/ Taiwan	Collaboration is associated with greater innovation	Quantitative. Innovation = 2 constructs (7 items) Collaboration = 4 constructs (21 items)
Gronum et al (2012)	Industrial and services/ Australia	SME collaboration is associated with greater innovation	Quantitative. Innovation = count of binary Y/N in respect of each of 12 types of innovation Collaboration = count of frequency of contact (3 values) with each of 9 partner types
Clauß (2012)	Manufacturing/ Germany	SME buyer-seller collaboration is associated with greater innovation	Quantitative. Innovation = 2 constructs (9 items - but only 2 are really innovation outcomes) Collaboration = 12 constructs (42 items)
Fitjar & Rodriguez-Pose (2013)	Industrial and services/ Norway	Collaboration is associated with greater innovation	Quantitative Measures not stated

Table 2.6 Empirical studies linking collaboration with innovation			
Authors	Industry/ Country	Findings	Methodology and measures for innovation and collaboration concepts, respectively.
Gonzalez-Benito et al (2016)	Private businesses/ Spain	Collaboration is associated with greater innovation. Channel collaboration is more important in small firms and consulting collaboration is more important in large firms.	Quantitative. Innovation = number of patents; plus R&D size; plus eight Likert scale items. Collaboration = eight Likert scale items
Simao et al (2016)	Manufacturing/ Portugal	Both channel and consulting collaboration is associated with greater innovation.	Quantitative. Innovation = binary Collaboration = two measures, each composed of three binary indicators.

Source=Author

Out of these 13 studies, 12 have found a significant positive relationship between collaboration and innovation. The one exception is the study by Frenz & Letto-Gillies (2009), who conjecture this is because of organisations possibly fearing opportunistic behaviour and also decisions to go solo on non-risky projects. Their data does not provide any evidence for these two conjectures. It is possible that their anomalous result could be methodological. Their study uses data from earlier Community Innovation Surveys, which had simplistic binary measures for collaboration. Another problem is that only 25% of respondents (167) declared positive sales from innovative products. This is a surprisingly small number. Notwithstanding this one result, overall, the other 12 studies do provide strong evidence of a relationship between collaboration and innovation.

A further weakness is that, of these 13 studies, 12 consist of statistical analyses of national surveys tailored for specific industrial sectors. Only one paper is qualitative and although this paper does consider the form of and outcomes from collaboration, it does not explore the innovation process or innovation decision making. Also, the context is logistics which is very different from tertiary education. The lack of qualitative studies related to collaboration and innovation has been noted by several writers (Greer & Lee, 2012). In addition, of the 12 quantitative studies, the measures used for innovation and collaboration are extremely simplistic, often being binary indicators. A typical measure for innovation is for the survey participant to answer the question: "Did your firm offer new or improved products to clients in the last three years", with a yes/no response. Similarly, the collaboration question often only requires a simple yes/no response. Such a simplistic approach gives rise to questions about the validity of the measures. Also, although four of the studies use quite complex measures for collaboration and innovation, these studies have other weaknesses. For example, with regard to Clauss (2012) only two of the nine innovation items relate to innovation outcomes, as opposed to innovation activities and none of his 12 collaboration constructs consider type of collaborative partner. In another of these three studies, the approach taken by Gronum et al (2012) in having 12 types of innovation and 9 partner types is a good one, except that both lists are poorly constructed. In the study by Gonzalez-Benito et al (2016), innovation includes patent

counts and R&D spend – not at all relevant to the TES. Finally, with regard to the paper by Hsueh et al (2010), the sample rate is only 10% which does limit the credibility of the findings. A good approach would be to involve a multi-dimensional approach to specifying both innovation and collaboration and this idea is developed later in this chapter.

Another significant problem with all 13 studies is the situational context. This thesis concerns tertiary education, ie the public sector, in the UK. None of the 13 studies involve public sector organisations. In fact most of the studies concern high technology firms. As is discussed in Chapter Six – TES Background, public and private sector organisations provide very different contexts in which to implement innovation and the distinction, for example, between collaboration and innovation in tertiary education organisations on the one hand and bio-technology or telecommunications firms on the other hand, is likely to be very marked. It follows that the results of these studies may not necessarily apply to services in general and public services, such as tertiary education, in particular.

There are two recent studies which explore collaboration in the HE sector – Fastner (2016), concerning the European Consortium of Innovative Universities and Romeau et al (2016), concerning on-line collaboration between teachers. Both studies are very specialised and do not give either a holistic picture of the influence of collaboration on innovation or a comparative evaluation of collaborator types.

2.4.3 Collaboration and innovation – collaborator types

This section explores how collaborator partners can be categorised, which partner types are collaborated with most frequently and which partner types make the greatest contribution to innovation.

Most collaboration is carried out within the supply chain, ie with customers and suppliers. Supply chain collaboration is particularly useful in specifying and designing products and services (Meyers & Athenide, 1991; Shaw, 1994) and to finding the right balance between price and performance (Shaw, 1994; Tether, 02). Also, if one

customer has accepted a design, it is more likely that others would follow (Pittaway et al, 2004; Tether, 02). Collaboration with competitors can bring benefits (Brandenburgher & Nalebuff, 1996; Ritala et al, 2016), for example in the establishment of standards (Tether, 2002). Collaboration with research organisations and universities has increased markedly in recent years due to the exhortations by the government for these organisations to play their part in improving UK competiveness and reducing public sector direct funding.

There have been found 23 empirical studies (21 different authors) that specifically focus on the relationship between different collaboration partners and organisational innovation. The analysis of these is set out in Table 2.7, overleaf. Please note that for each entry, there is one line describing the situation followed by one line describing the findings. The situation line includes 7 columns which provide indications of the purpose, context and methodology of the study and 12 columns which indicate which partner types are included in the study. The legend for the table headings is given after the table.

Table 2.7 Empirical studies where collaborator type is linked with innovation

Author	Industry	Location	Method	Measures	Analysis: Frequency of contact	Analysis: Source of Ideas	Analysis: Relationship	Partner Types: Customer	Supplier	Competitor	Research Org	University	Consultant	Intermediary	Co-supplier	Distributor	Professional Ass	Conglomerate Unit	Government
Tether (2002, 2003)	B	W	D	S	☒			☒	☒	☒	☒	☒	☒						
	There is an association between the level of spend on R&D and collaborative activity. Firms collaborate with all partner types except universities.																		
Pittaway et al (2004)	B	-	M	-				☒	☒	☒	☒	☒	☒						
	General meta-analysis																		
Faems (2005)	M	C	D	M			☒	☒	☒	☒	☒	☒	☒					☒	
	Supply chain collaboration (customers and suppliers) is associated with innovation of existing products/ technologies, while universities/ research organisation collaboration is associated with radical innovation of products/ technologies.																		
Nieto & Santamaria (2007)	M	C	D	S			☒	☒	☒	☒	☒								
	Collaboration with suppliers, research organisations and customers has a significantly positive association with innovation – higher in the first two than the third. There is no association between collaboration with competitors and innovation.																		
Robson & Haigh (2008)	M	W	D	S	☒	☒		☒	☒	☒	☒	☒	☒					☒	
	The frequency of collaboration of innovative organisations with partners and the frequency of source of innovative information in respect of partners is described – please see body of text.																		

Table 2.7 Empirical studies where collaborator type is linked with innovation

Author	Industry	Location	Method	Measures	Analysis: Frequency of contact	Analysis: Source of Ideas	Analysis: Relationship	Partner Types: Customer	Supplier	Competitor	Research Org	University	Consultant	Intermediary	Co-supplier	Distributor	Professional Ass	Conglomerate Unit	Government
Tsai (2009)	M	E	S	S			☐	☐	☐	☐	☐								
	The relationship between collaboration and innovation is highly contingent on the type of innovation, the sector and the size of organisation. Generally, there is a significant positive association between each of suppliers and customers with innovation, but this is completely moderated by absorptive capacity.																		
Hsueh et al (2010)	S	E	S	C			☐	☐	☐		☐								
	There is a significant positive association between collaboration with each of suppliers and customers but not with research organisations.																		
Nieto & Santamaria (2010)	M	C	D	S			☐		☐	☐									
	Suppliers and customers are the most important partner regarding innovation. Collaboration in SMEs is more important for product compared with process innovation.																		
Un et al (2010, 2015)	M	C	D	S			☐	☐	☐	☐		☐							
	For both product and process innovation, suppliers are the most important partner followed by universities. Customers have a neutral effect while competitors have a negative effect. Access to knowledge is more important than breadth of knowledge.																		
Wagner (2010)	M	C	S	C			☐		☐										
	Supplier orientation to customer has a significant impact on customer new product performance.																		
Zeng et al (2010)	M	E	S	S			☐	☐	☐	☐	☐		☐						☐
	A significantly positive association between collaboration and innovation was found between all categories of partner except for government agencies.																		

Table 2.7 Empirical studies where collaborator type is linked with innovation

Author	Industry	Location	Method	Measures	Analysis: Frequency of contact	Analysis: Source of Ideas	Analysis: Relationship	Partner Types: Customer	Supplier	Competitor	Research Org	University	Consultant	Intermediary	Co-supplier	Distributor	Professional Ass	Conglomerate Unit	Government
Gnywali & Park (2011)	T	E	C				☐			☐									
	A case study showing that co-operation between Samsung and Sony, who are competitors, led to each deriving innovation benefits plus wider business society innovation benefits.																		
Lewrick et al (2011)	T	C	S	C			☐	☐		☐									
	A strong competitor orientation has a positive relationship to incremental innovation for start-up companies, but it is contra productive for mature companies. In mature organisations a strong customer orientation is associated with radical innovation.																		
Foss et al (2011)	B	C	S	M			☐	☐											
	There is a strong positive relationship between collaboration with customers and innovation performance, but this is mediated by the existence of internal innovation support practices.																		
Partanen et al (2014)	T	C	C				☐	☐	☐			☐				☐			
	Collaboration with customers is associated with radical innovation; collaboration with universities and distributors is associated with incremental innovation																		
Menguc et al (2014)	T	W	S	C			☐	☐	☐										
	Customer involvement in design helps new product performance under high incremental innovation capability but harms new product performance under high radical innovation capability. In contrast, supplier involvement in design was beneficial to new product performance under both high incremental and radical innovation capability.																		

Table 2.7 Empirical studies where collaborator type is linked with innovation

Author	Industry	Location	Method	Measures	Analysis			Partner Types											
					Frequency of contact	Source of Ideas	Relationship	Customer	Supplier	Competitor	Research Org	University	Consultant	Intermediary	Co-supplier	Distributor	Professional Ass	Conglomerate Unit	Government
Park et al (2014)	T	W	D	P			☐			☐									
	Collaboration with a competitor is significantly associated with innovation, especially if mix of one-sided and common innovation																		
Kim & Lui (2015)	T	E	D	S			☐	☐	☐		☐	☐						☐	☐
	Market networks positive for process/organisational innovation; institutional networks positive for product innovation; conglomerate networks positive for both types of innovation.																		
Codini (2015)	T	C	C				☐	☐	☐	☐	☐		☐	☐	☐	☐	☐		
	This is case study of a single technological innovation by one company. The most important relationships by far were with customers, although the nature of these relationships changed over the technology life cycle.																		
Fidel et al (2015)	B	C	S	M			☐	☐											
	There is a significant positive relationship between customer collaboration in the innovation process and marketing results.																		
Wang et al (2016)	B	E	D	M			☐	☐	☐										
	A customer orientation, mediated by supplier collaboration and technological capability, had a significant positive effect on innovation performance in both manufacturing and service companies.																		

Source=Author

Table 2.7 legend

Industry: M=making goods; T=if those goods are high technology; S=providing services; B=both goods and services; if the participants are SMEs, the indicator is underlined
Location: W= UK/ USA/ Australia; C=Continental Europe; E= Far East; O= other
Method: D= statistical based on a national database/ survey – if underlined, indicates use of the Community Innovation Survey; S= statistical based on a specially tailored survey; C= qualitative case study; M= meta-analysis
Measures: Only completed if method is statistical. S or M or C or P = whether measures for collaboration and innovation are either Simple (eg binary) or Moderately complex (eg single dimension having several values) or Complex (many items with many values) or, if P, then indicates patents are used, often to determine both innovation and collaboration measures
Analysis: There are three headings categorizing the type of analysis: 1) The frequency of collaboration by partner type; 2) The source of ideas by partner type; and 3) The correlation between collaboration and innovation for that partner type.
Partner Types: A cell is ticked if that partner type is measured separately in the study. Note that some partners are considered severally.

The first task is to analyse the range of partner types. Overall, there are 12 partner types included across the 23 studies – with certain partner types occurring much more frequently than others – please see Table 2.8.

Table 2.8 Frequency of appearance of each collaborator type in the empirical studies

Partner type	Frequency
Customer	14+4
Supplier	12+4
Competitor	11+ 3
Research Organisation	7+2
University	7+2
Consultant	+5
Intermediary	+2
Distributor	+2
Professional Association	+2
Conglomerate Unit	+2
Government	1+1

Note the + numbers refer to incidences where the partner type is jointly counted with other partner types.
Source=Author

As a result of this frequency analysis, the remainder of this analysis focuses on four categories of partner type - customer, supplier, competitor and knowledge provider.

The latter consist of the merger of research organisation, university and consultant, which have similar functions and similar results. The remaining five categories are not included as they are situation specific and there is relatively little data. The exception is that some comments are made on the findings in respect of government partner type, as this type is particularly relevant in the TES and only found in two studies.

The most important question is what the studies have to say about the relationship between specific partner types and innovation. We are looking for two things – relationship patterns and evidence that the methodologies and situations are relevant. Table 2.9 sets out an analysis of the 19 studies (18 authors) which explore the relationships between partner type and innovation. Each of these studies has its own emphasis which means that many results are contingent on specific circumstances eg only applying to one of incremental or radical innovation, or only applying to one of product or process innovation, or only applying to one of small or large organisations, or only applying to one of manufacturing or service organisations or only applying to one of start-up or mature organisations. The purpose of this analysis is not to identify a complete contingent picture (the data is too sparse for that) but to get an indication as to whether any partner type appears to have a strong relationship with innovation. In the table, there is a separate heading for any result which is contingent – ie a positive relationship has been found, but only in some circumstances.

Table 2.9 Relationship patterns between collaborator type and innovation

Partner Type Results ➔	Customers			Suppliers			Competitors			Knowledge Providers		
Authors (studies) ⬇	+	+*	N	+	+*	N	+	+*	N	+	+*	N
Faems (2005)		▯			▯						▯	
Nieto & Santamaria (2007)	▯			▯					▯	▯		
Tsai (2009)		▯			▯				▯			▯
Hsueh et al (2010)	▯			▯								▯
Nieto & Santamaria (2010)	▯			▯								
Un et al (2010)			▯	▯					▯	▯		
Un et al (2015)			▯	▯					▯	▯		
Wagner (2010)				▯								
Zeng et al (2010)	▯			▯			▯			▯		
Gnywali & Park (2011)							▯					
Lewrick et al (2011)		▯						▯				
Foss et al (2011)		▯										
Partanen et al (2014)		▯									▯	
Menguc et al (2014)		▯		▯								
Park et al (2014)							▯					
Kim & Lui (2015)		▯			▯						▯	
Codini (2015)	▯				▯			▯			▯	
Fidel et al (2015)	▯											
Wang et al (2016)	▯				▯							
Totals	7	7	2	8	5	0	3	2	4	4	4	2

\+ indicates a positive relationship has been found

+* indicates a positive relationship in some circumstance has been found, ie subject to certain contingencies

N indicates that no relationship or a negative relationship has been found

Source=Author

Each paper is treated equally rather than the results manipulated, as one would do in a formal meta-analysis. With regard to customers, out of 16 relevant studies, there are 14 showing a positive relationship with innovation, but 7 of these are contingent. With regard to suppliers, out of 13 relevant studies, all 13 show a positive relationship with innovation, but 5 of these are contingent. With regard to competitors, out of 9 relevant studies, there are 5 showing a positive relationship with innovation, but 2 of these are contingent. With regard to knowledge providers, out of 10 relevant studies, there are 8 showing a positive relationship with innovation, but 4 of these are contingent. The overall pattern shows promising evidence of a relationship between each partner type and innovation, albeit this evidence is not overwhelming and is often subject to contingencies. Relationships with both customers and suppliers, key elements of the

supply chain, are positively linked with innovation, although the detailed evidence suggests that the relationship with customers has the deepest influence. This is compatible with the evidence cited later in this sub-section which shows customers being the most frequently cited partner as a source of innovation knowledge. The detailed evidence does not give any insight as to why suppliers might also be an important partner for innovative collaboration. It could be that organisations find it advantageous to piggy back on the shoulders of their suppliers' innovations.

Turning now to situational context and methodology in the 23 studies, it is clear that the same weaknesses in relevance and approach are found as with the holistic studies analysed in Section 2.4.2. With regard to industry type, of the 23 studies, 22 are mainly manufacturing, 7 of which are high technology manufacturing. 6 of these studies also include service companies, but only one focusses solely on service organisations and these are all high-tech software firms. None of the studies includes public sector organisations. With regard to methodology, of the 23 studies, 20 are quantitative (of which 16 show statistical correlations between collaboration and innovation, 3 others show frequency statistics and one is a meta-analysis) and only 3 are qualitative. Of the 16 studies including statistical correlations, 7 use simple measures for collaboration and innovation, 4 use simple multi-item scales, 4 use quite complex measures and one uses patents. Although complex measures are preferable, the 4 studies with complex measures have weaknesses: one has a very low response rate, one has very obscure research questions, one mainly concerns technological start-ups and one only concerns high technology products and does not include process or organisational innovation. Looking specifically at the 3 qualitative studies, one is a case study of the long-term tie-up between Samsung and Sony: one concerns four small high tech Finnish firms, and one concerns the 10-year life cycle of an innovative piece of machinery. In conclusion, although there are a fairly large number of studies, there are few qualitative studies and those few have situations that are not relevant; and with regard to the quantitative studies, there are weaknesses both with their situational context and the robustness of their measures.

While the main focus of analysis of these studies is on the relationship between specific partner types and innovation, a few studies look at the frequency of collaboration with each partner type and the frequency with which that partner type is used as a source for

innovation knowledge. Looking specifically at the findings in the paper by Robson & Haigh (2008), which uses data from the UK version of the Community Innovation Survey, the frequency of collaboration of innovative organisations with different partner types is: suppliers and customers 70%; conglomerate units 55%; and each of competitors, consultants, universities and research organisations between 25-35%. These results are intuitively reasonable. One would expect frequent contact with supply chain organisations as this is part of on-going operations. The frequency that each type of partner is a source of innovation knowledge is: customers 37%, conglomerate units 33%, suppliers 18%, competitors 17% and consultants/ universities/ research organisations 4% or less. As might be expected, innovation know-how is sought from customers and conglomerate partners. However, the surprise is how low down in % terms are the knowledge providers: this does not seem compatible with the frequency of contact %s.

2.4.4 Collaborative processes – relationship building

2.4.4.1 Social capital

This sub-section covers the collaborative process of relationship building. When networks of enduring relationships accrue actual or virtual value, Bourdieu (1985) called this social capital. Nahapiet and Ghoshal (1998) applied the concept to organisations and defined it thus:

"Social capital is the sum of the actual and potential resources embedded within, available through, and derived from the network of relationships possessed by an individual or social unit." (p.4)

In this thesis, the important benefit of social capital is the opportunities that it enables for innovation. It is the complementary nature of partner knowledge stocks and the potential for combining knowledge elements previously unconnected, or developing novel ways of combining knowledge elements already connected, that drives innovation (Schumpeter, 1934; Cowan et al, 2007; Baum et al, 2010). This recombination is difficult as one has to disentangle and recombine knowledge from small fragmented domains that exist in the business world (DiMaggio, 1997). It is

more difficult, but typically more fruitful, to combine knowledge across different technology domains (Ferguson & Carnabuci, 2017).

Nahapiet & Ghoshal (1998) identify three relationship dimensions which facilitate social capital and thus innovation: these are structural, cognitive and relational. The structural element consists of an organisation's network ties and network configurations which provide access to, and the easy exchange of, knowledge resources (Nahapiet & Ghoshal 1998). The cognitive element consists of being compatible in mind-set and know-how, through shared language, narratives and mental models (Nahapiet & Ghoshal 1998; Boschma, 2005). These influence the quality of knowledge combination and exchange (Nahapiet & Ghoshal 1998; Grant (1996b). The third element is relational and consists of trust, the sharing of general values and norms - specific obligations built up over past events, and perhaps also a shared group identity. This trust exists at the individual level and, through a common framework of norms, at the organisational level (Boschma, 2005). Boschma (2005) includes a fourth element, geographical proximity.

Several empirical studies have found a positive association between social capital and innovation, including studies by Tsai & Ghoshal (1998), Tsai (2002), Landry et al (2002), Subramaniam & Youndt (2005), ßstieler et al (2015), Akhavan & Hosseini (2016) and the meta-analysis by Zheng (2010). These all concern quantitative surveys. It is important to note that the meta-analysis by Zheng (2010) and the studies by ßstieler et al (2015) and Akhavan & Hosseini (2016) failed to find a relationship between the cognitive element of social capital and innovation.

As social capital involves soft constructs, it is useful to find that there are two qualitative studies concerning social capital in a UK tertiary education setting. The first study was conducted by Dhillon (2009). He studied a Midlands based voluntary educational partnership which was formed in 1997 and lasted over a decade. It consisted of one university, several FE colleges and other educational providers. Its goal was to improve the quality of post-16 education in the region. It was deemed a success, particularly because it encouraged widening participation. Dhillon (2009) did not start out with the aim of studying social capital per se but during the analysis realised that the success of the partnership was due to the members sticking together

despite other similar partnerships coming and going. He thought that social capital was the glue. Dhillon (2009) interpreted social capital as "the networking, trust, norms and values that enable individuals and organisations to achieve mutual goals" (p.692). The second study by Camps & Marques (2014) involved the Faraday Partnership and university-industry technology transfer.

Each of the component concepts of social capital are now considered in turn, ie network structure, cognitive compatibility and trust.

2.4.4.2 Network structure

Network structure indicates how social capital is configured within an industry and where the opportunities for collaborative innovation are positioned (Walker, 1997). Networked innovation depends on social capital rather than market or hierarchical mechanisms (Swan & Scarbrough, 2005). According to Burt (1980), there are two approaches to analysing network structure – a relationship approach which describes the closeness of the relationship (or ties) between pairs of actors and the positional approach which describes the pattern of relationships, especially the notion of centrality, in a system of actors. It will be seen that both concepts have a significant bearing on innovation.

The relationship aspect of network structure is founded on the concept of strong and weak ties. Granovetter (1973, 1983) developed the logic of strong and weak ties as follows. A strong tie is one where actors interact frequently and have strong emotional bonds. A weak tie is a relationship between actors who do not share any mutual strong ties. So an actor can have a network of ties: the strong ties will know each other, while the weak ties will know none of the actor's strong ties, but may have other ties of their own. When it comes to learning new information, weak ties are best. What one learns from strong (ie close) ties is often what one knows already, because these people are likely to be similar to us. Therefore, an abundance of strong ties is not very useful for gathering new information. On the other hand, weak ties are an excellent source of non-redundant, ie new information. This is not only because the weak tie has a different information set but also because the weak tie is likely to be connected with lots of others with whom one is not already connected. These are indirect ties, and

these will have new knowledge as well. Granovetter's logic continues as follows. When it comes to disseminating information widely, weak ties are best, since if one tells strong ties, the information will just circulate within one's own network of strong ties, and the idea or innovation will be still born. However, if one communicates with weak ties, the information will diffuse and traverse a greater social distance. Of course, as they are weak ties, their interests may be different, and this may preclude them from wanting to pass on the information.

Following on from Granovetter's initial ideas, Burt (1987) developed further social networking concepts, such as contagion, ie the propensity to transfer something from one network member to another; network density, ie ties in a network compared to the number of ties possible in that network; and network cohesion, ie the rate of average tie strength between members within a group compared with average tie strength of those members with outsiders. However, he is most famous for coining the term structural holes (Burt (2004) as a metaphorical generalization of how weak ties form a bridge to other networks of ties.

There is very little difference between the respective ideas of Granovetter and Burt, except that the former emphasises individuals and the latter emphasises whole networks and the opportunities for entrepreneurial behaviour. Granovetter considers individuals as the unit of analysis and derives theories about groups from the geometrical configuration of the connectivity of individuals. Burt and nearly all subsequent empirical work, identifies groups per se as the unit of analysis. This is an important distinction. Later, there was much theoretical debate in the literature between the merits, in terms of innovation, between structural holes (ie bridging ties) and closed (ie cohesive) groups. However, Burt recognised the advantages of both, when he said that brokerage (ie operating through structural holes) increases the value of co-operation and closure lowers the risks of co-operation.

There have been many empirical studies that have demonstrated that a dual network consisting of strong ties, but with structural holes, is the optimum configuration for innovation. These studies include those by: Hansen (1999), Reagans et al (2001), Reagans & McEvily (2003), Ahuja (2000b), Zaheer (2005), Capaldo (2007), Sampson (2007), Schilling & Phelps (2007), Tiwana et al (2008), Phelps (2010), Rost et al

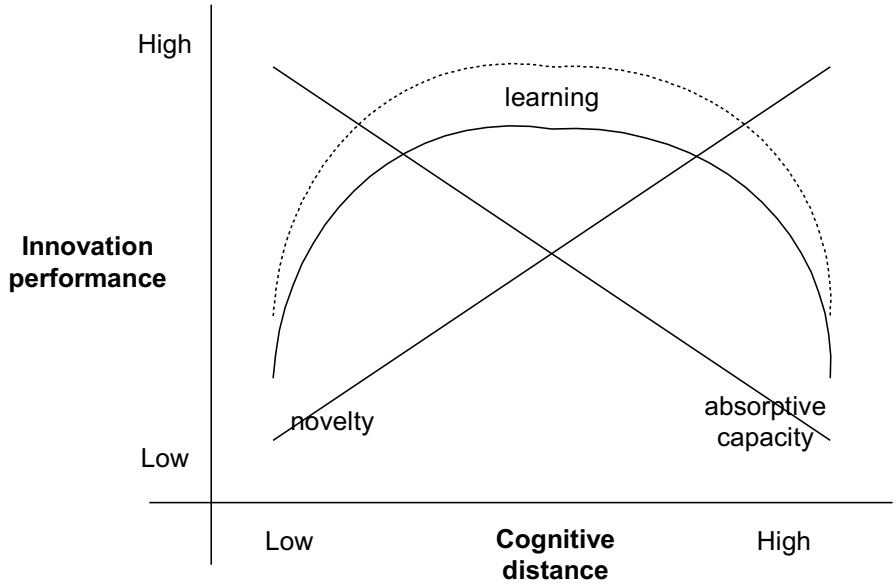
(2011), Hemphala & Magnusson, 2012), Michelfelder & Kratzer (2013) and Bellamy et al (2014). The collective finding from these studies is that the benefit operates as a two-step process: structural holes enable the scanning and vicarious evaluation of a diverse range of opportunities, while the cohesiveness of strong ties enables knowledge integration and a smooth implementation of change. In addition, Singh et al (2016) found that combinatory knowledge is easier to discuss and share with direct ties than with indirect ties. Finally, Carnabuci & Eth (2015) found that individual style is a differentiating factor: those with an adaptive cognitive style (good at doing things better in a familiar setting) are more innovative given structural holes; while those with an innovative cognitive style (good at doing things differently in a new situation) are more innovative give a closed dense network. Yet again, all of these studies, except for the one by Capaldo (2007) are quantitative, generally using a sociometric approach. Another problem with these studies, vis-à-vis this thesis, is that most of the studies involve R&D units, and the subject matter, typically, is rather technological. It would be more relevant if the studies included the networking of senior managers.

The other approach to analysing network structure and innovation concerns network centrality. Granovetter (1973) commented that in sociometric studies, the person who is chosen most by other members is in some sense central within the group and those chosen least is marginal. He conjectured that new ideas tend to originate at the periphery of a network and then may be taken up and implemented by central players. However, four empirical studies by Tsai (2001), Salman & Saives (2005), Dahlander & Frederiksen (2012) and Roxenhall (2013) and a meta-analysis of 40 studies by Wang (2015) have shown the opposite is true, and that being in the centre of a network is positively associated with innovation. Again, these are all quantitative studies.

2.4.4.3 Cognitive compatibility

Cognitive compatibility refers to partners having similar mind-sets. In contrast to network structure, there has been very little scholarly work in this area. The most relevant is the paper by Nooteboom et al (2007), which explores the relationship between cognitive distance, ie the gap between partners' shared mind-sets, and innovation performance. Nooteboom et al (2007) hypothesised and found an inverted U-shaped curve as depicted in Figure 2.2.

Figure 2.2 Cognitive distance mapped against innovation performance



Source=Nooteboom et al (2007)

Nooteboom et al's (2007) reasoning was that as cognitive distance increases, ie there is a lesser shared mind-set, then absorptive capacity with that partner also reduces, but compensating relationships with other partners result in an increase in the diversity of knowledge. This reaches an optimum point of learning and innovation performance, which then falls off as the lack of absorptive capacity outweighs any novelty effect. In the diagram, the higher learning curve represents Nooteboom et al's (2007) hypothesis that this effect is more pronounced with radical innovations than it is with incremental innovations.

2.4.4.4 Trust

Trust is the third element of social capital. There is a rich literature base, which needs to be filtered to extract what is especially relevant to collaboration and innovation. It is proposed that five forms of trust are most pertinent, within the context of this thesis.

Three of the forms are from the model developed by Mayer et al (1995), who identified three attributes of the trustee that would facilitate trust – ability, benevolence and integrity. Ability concerns skills and know-how within a specific domain. Collaboration partners would need skills specific to their contribution to the partnership

and more general skills in understanding the responsibilities of a collaborative partner (Muthusamy & White, 2005). Benevolence implies the trustee has good intentions towards the trustor. In a collaborative agreement, for example, it means that one party will not take opportunistic advantage with sensitive commercial knowledge acquired during the collaboration (Saxenian, 1991). Integrity implies that the trustee conforms to a set of recognised principles, for example, that they consistently keep promises (Muthusamy & White, 2005). The main criticism of the Mayer et al (1995) model is that it is uni-directional and lacks reciprocity (Galford & Drapeau, 2003; Schoorman, 2007).

Another relevant model, is based on cognitive trust and social trust (Kramer, 1999; Van de Ven & Ring, 2006). Cognitive trust involves weighing up the potential gains, losses and risks of a relationship (Coleman, 1990). This would make sense in the case of a collaborative agreement. On the other hand, social trust is built more on altruism and faith (Van de Ven & Ring 2006), when we enter into a trusting relationship on emotional grounds (McAllister 1995). This does not seem as relevant to an organisational situation compared to a personal situation. Associated with social trust is having the confidence that vulnerability will not be exploited (Sabel, 1993). This is an individual emotion. Of course, individuals enact collaborative agreements, but as agents for their organisation. The degree of personal risk is hence buffered. Thus, this author argues that cognitive trust is highly relevant to collaboration/ innovation, but social trust is less relevant in an organisational setting.

The fifth form of trust relevant to collaboration/ innovation is organisational trust (Dodgson, 1993b). This is based not just on personal relationships, but also on the expectations of specific roles and shared policies and strategies (Dodgson, 1993b). When partners exchange sensitive information over a long time, trust becomes engrained in joint organisational routines and joint values of the partners (Saxenian, 1991). According to Hakansson & Johanson (1988), organisational trust will be embedded in the technical, knowledge, social, administrative and legal systems of the partnership.

To summarise, the five types of trust that are most relevant building blocks in a collaboration/innovation context are – ability, benevolence, integrity, cognitive and

organisational trust. However, the key to successful organisational collaboration is the continual and spiralling interaction of reciprocal commitments (Saxenian, 1991; Muthusamy & White, 2005). This may take a long time to develop and, as with any relationship, there may need to be the management of periodic misunderstandings (Saxenian, 1991; Dodgson, 1993b; Rousseau, 1998) and trust may be more difficult to develop when there are multiple partners (Davis, 2016). The main way of demonstrating reciprocity is the amount of time, effort and mutual adjustment invested in the collaborative agreement (Muthusamy & White, 2005)

2.4.5 Collaborative processes – collaborative working

Collaborative working is the second topic concerning collaborative processes in the literature model. It refers specifically to substantive innovative or operational activities, as opposed to pure relationship building. The most important topic in this area is knowledge transfer.

2.4.5.1 Knowledge transfer

Knowledge is the fundamental stuff of innovation, and so knowledge transfer is one of the most fundamental processes in the collaboration/ innovation context. Appleyard (1996) defines the process of knowledge sharing as "the transfer of useful know-how or information across company lines" (p.138). Argote (2000a, 2000b), gives a more outcome related definition of knowledge transfer as "the process through which one unit .... is affected by the experience of another" (p.151) and Easterby-Smith & Lyles (2011) similarly define it as "an event through which one organization learns from the experience of another" (p.677). Three quantitative studies by Carusgil et al (2003), Schilling (2007) and Charterina (2016), respectively, demonstrate an association between knowledge transfer and innovation.

Knowledge can include a wide array of subject matter. Child (2001) describes three levels of knowledge – technical, systemic and strategic. Technical includes individual technologies or techniques; systemic includes a whole technological architecture or the complete restructuring of roles and relationships; and strategic includes changes in

mind sets and values. The more complex the knowledge, eg strategic knowledge, the more complex the processes between the seeker and provider need to be (Carlile, 2004) and the more trust there needs to be. Another useful distinction is between explicit knowledge (written down in recognised language) and tacit knowledge (know-how in our minds that we may not even be aware of). Many writers (Grant 1996b; Spender 1996; Kogut & Zander 1992) have proposed and some have tested (Chen, 2004: Simonin, 1999) that tacit knowledge is more difficult to transfer than explicit knowledge. This is not surprising as tacit knowledge is abstract, subjective and, often, is not even well articulated by those who possess it. Generally, it is easier to transfer knowledge within business groups where the participants share a common strategy, structure, culture and history (Ranft & Lord, 2002).

Szulanski (1996) and Almeida et al (2003) agree that there are three stages in knowledge transfer. However, their approach within each stage is markedly different. The three stages are - the search for knowledge, the transfer or exchange of knowledge and the integration or routinisation of knowledge. Almeida believes that the search for knowledge is shaped by existing expertise and past experience while Szulanski believes that firms identify a knowledge gap and conduct a probablemistic search for opportunities to fill it. Almeida's approach to knowledge transfer is structural, emphasising the roles of staff recruitment, firm alliances and firm networks while Szulanski emphasises cultural alignment, motivation and good communications and co-ordination. Finally, Almeida's approach to integration is based on using structural and cultural facilities within the firm and having a knowledge architecture into which new knowledge can be slotted while Szulanski emphasises the need to identify and resolve unexpected problems, for example causal ambiguity, during a period of use before the new knowledge becomes routinized.

One of the dangers of sharing knowledge is the risk that one's partner uses the knowledge opportunistically to damage one's competitive or reputational position. Loebbecke et al (2016) have proposed a series of co-ordination and control mechanisms (structural, procedural, technical and social) to manage this risk given specific situations (tacit vs explicit; and unilateral vs multilateral knowledge sharing).

Hand in hand with the concept of knowledge transfer is the associated concept of absorptive capacity. This is the ability of the knowledge receiving organisation to assimilate and exploit the new knowledge. As Tang (2009) found, collaboration without absorptive capacity is worthless. The term absorptive capacity was first used by Cohen & Levinthal (1990) who defined it as: "the ability of a firm to recognise the value of new, external information, assimilate it, and apply it to commercial ends." (p.128). Cohen and Levinthal's (1990) theory assumes that learning performance is improved if the new knowledge is related to the existing knowledge, especially in terms of mental models and skills requirements. Experience gained directly, and vicariously, together with the development of relevant organisational roles and routines improves an organisation's level of absorptive capacity. Lane et al (2006) emphasise the virtuous circle between absorptive capacity and innovation. Key enabling features are communications structures, both internal and external, and the nature and spread of expertise within the organisation (Cohen and Levinthal, 1990); Van den Bosch et al, (2003); an organisation's history of innovation and the experience of its senior management team (Smith et al, 2005); the roles of knowledge gatekeepers and boundary spanners (Volberda, 1996); and a balance of both technological and marketing know-how (Lichtenthaler, 2009). A meta-analysis by Whitehead et al (2016) identified that the distributive capability of the provider is important as well as the absorptive capacity of the receiver.

2.4.5.2 Other forms of collaborative working

To complete the picture, other forms of collaborative activity, apart from knowledge transfer, include sharing resources (Hardy et al, 2003), joint research and development (Hagedoorn, 1993; Simonin, 1997) and joint operations (Simonin, 1997; Inkpen, 2000).

2.4.6 Collaborative structures - inter-organisational networks

This sub-section covers inter-organisational networks, which is a generic term covering any formal or informal purposive relationship between organisations. Much of the literature concerns alliances, which are formal relationships that go beyond routine supply chain relationships. De Man & Duysters (2005) published a meta-analysis

concerning the relationship between alliances and innovation. They found that 73% of studies demonstrated a positive association, 10% a negative association and 17% a neutral association. On the other hand, Deeds & Hill (1996), found evidence for a more complex U-shaped curve between the number of alliances and product innovation, the trailing off in innovation performance being caused by the onset of diminishing returns and problems with managing many partners.

Innovation is enabled in alliances by the partners' respective diversity of knowledge and experience coupled with the process of knowledge transfer and the potential for the novel synthesis of knowledge when integrated with complementary host knowledge (Podolny, 1997; De Man & Duysters, 2005). Specific knowledge transfer opportunities include technological know-how (von Hippel, 1994; Gulati, 1998; Laursen & Salter, 2006) and marketing know-how (De Mann & Duysters, 2005; Podolny, 1997; Hagedoorn, 1993). A deeper relationship between network partners, what Uzzi (1997) calls embeddedness, leads to greater efficiency and adaptability, but can also lead to complacency and a tendency to ignore external signals (Uzzi, 1997). Greve (2005) developed a comprehensive, coherent and convincing model of the overall factors which determine the rate of learning in alliances. There are three elements to Greve's model. Firstly, there is the infectiousness of the source organisation - this consists of the accessibility of the knowledge and the perceived status and performance of the source organisation. Secondly, there is the relevance of knowledge and the social proximity of the source and destination organisations, including the configuration of network ties. Finally, there is the susceptibility of the destination organisation, due to absorptive capacity and motivation. This model has not been tested empirically.

Alliances have theoretical benefits wider than knowledge transfer. For example, organisational networks, through lower transaction costs, less uncertainty and greater flexibility have the best advantages of both hierarchical and market structures (Podolny, 1997; Barringer & Harrison, 2000). Another economic benefit is the ability to share research & development and production costs and to share risks, especially of large research projects (Hagedoorn, 1993; De Man & Duysters, 2005). There is also the possibility to combine complementary capabilities, either in the form of a supply chain (Porter, 1985), or in the production of competitive edge products (Barringer & Harrison, 2000) or in the expansion of product range / entry into new markets

(Hagedoorn, 1993). Concomitant with economic benefits is a potential increase in power – over scarce inputs (Podolny, 1997; Oliver & Ebers, 1998; Barringer & Harrison, 2000) – or in terms of market share (Eisenhardt & Schoonhoven, 1996; Gulati, 1998; Barringer & Harrison, 2000). There are also potential benefits in acquiring legitimacy and status second hand from one's partner (Podolny, 1997; Oliver & Ebers, 1998; Barringer & Harrison, 2000) and public relations benefits of collective lobbying (Barringer & Harrison, 2000).

Alliances can have a variety of forms from loose associations where there are no commitments to formal arrangements, such as joint ventures, controlled by contract. More intense forms involve closer collaboration and tend to lead to greater innovation (De Man & Duyster, 2005; Goes & Park, 1997). Specifically, alliances are more successful if there is a strong strategic and cultural fit between the partners (Grandori & Soda, 1995; Barringer & Harrison, 2000), particularly knowledge bases (Lane & Lubatkin, 1998); if there are strong mechanisms for co-ordination (Ritter, 1999); and if the partners have previous alliance experience (De Man & Duyster, 2005) or the senior managers have relevant experience (Eisenhardt & Schoonhoven, 1996; Kim & Higgins, 2007; Powell et al, 1996). An interesting qualitative study by Lam (1997) shows that knowledge sharing can fail if the partners have different cultures. Lam's (1997) example was an attempted corporate collaboration between a British firm and a Japanese firm, where the key cultural differentiators were that the British firm had a professional organisational model, with an emphasis on tasks and a codified knowledge base; whereas the Japanese firm had an overlapping teams based organisational model, with an emphasis on people and a tacit knowledge base.

Social capital is important in the success of alliances. Three studies by Parkhe (1993), Moore (1998) and Kale et al (2000) each contribute to understanding the typical process for how social capital develops. To start off, there must be a clarity of alliance objectives, benefits, roles and respective contributions to be made by each partner. After that, partners' behaviours should be characterised by integrity, transparency and reciprocity. Over time, this will lead to an increase in trust, especially a trust that partners will not behave opportunistically, and a consequential increase in respective

partner contributions to alliance assets. The overall result will be greater business performance.

Another key factor in the success of alliances is the approach to choosing partners. Typically, the best alliance partners for larger firms are niche firms with knowledge of leading edge technology; and for smaller firms, the best partners are larger firms with a strong sector reputation (Stuart, 2000). One approach is to choose partners with diverse capabilities (Phelps, 2010). This provides the opportunity for both partners to recombine novel knowledge, but having to deal with dissimilar partners may mean high transaction costs of knowledge transfer and the risks of knowledge leakage. Examples of alliances of complementary capabilities are matching one partner with strong technical capabilities with another partner with commercial capabilities (Ahuja, 2000a) and matching partners with resource compatibility, ie similar production capabilities, but market complementarity, ie different marketing targets (Mitsuhashi, 2009).

2.4.7 Collaborative structures - professional networks

This sub-section covers relationships between individuals where, although the contact may concern an organisational matter, the individuals are acting in a personal capacity rather than as a representative of their organisation. A good networker needs specific skills – being able to build relationships with a wide variety of contacts from diverse backgrounds; being able to listen, with an open mind; and being able to give as well as take (Perle, 2015).

Only one paper has been found that associates professional networking specifically with organisational innovation. This is the survey of Swedish telecommunications managers by Rodan & Galunic (2004). They found that sparse networks, ie where few people know each other, and, especially, networks with knowledge heterogeneity, are conducive to innovation. This is the network structure proposition outlined in Section 2.4.4.2 and is not very insightful in respect of professional networking per se.

There have been several studies, not specifically covering innovation, concerning professional networking in a USA tertiary education context. Hitchcock (1995) found that the three most common reasons for professional networking concerned mentor-

protégé relationships, work problems and social matters. Most tertiary education networking is with other academics (Hinds, 2000), is within the same discipline (Hitchcock, 1995), and is often with previous colleagues (Pifer, 2010). Hitchcock (1995) found the benefits of tertiary education professional networking to be research performance and career enhancement: he does not mention innovation.

In the UK, Carter (2004) studied the collaborative behaviour of lecturers in an FE college. He found that collaboration mostly concerned student matters and was highest within a programme team, although this occasionally extended to internal welfare units and external welfare agencies. He did find that lecturers were enthusiastic about the potential for other areas of collaboration, but they said that a lack of time was a significant barrier. As with Hitchcock (1995), Carter (2004) found that lecturers had more affinity with colleagues running the same course in other colleges than colleagues running other courses in their own college.

Professional networking sometimes involves attending public domain conferences and similar events. Mitchell et al (2016) surveyed the benefits of these events and found the value to individuals to be: access to new knowledge, best practice and innovation opportunities; business development opportunities; the development of social capital; and reputational benefits (doing business in the right place with the right people).

2.5 DEVELOPMENT OF RESEARCH OBJECTIVES

2.5.1 Introduction

The purpose of this sub-section is to review the literature material in Section 2.4, covering the relationship between collaboration and innovation, with the aim of identifying gaps or interesting angles in the theory; and weaknesses in the empirical evidence in terms of situation or methodology; and then to go on to develop the research objectives for this thesis. In the first instance, a broad summary is presented, and this is followed by detailed arguments.

2.5.2 Summary of the state of existing literature vis-à-vis this research

Table 2.10 – Summary of the state of existing literature vis-à-vis this research

Theme	Quality of existing theory	Quality of existing empirical evidence
Collaboration ⇨ Innovation	Sound	Consistent, but almost entirely quantitative, with weak measures, and rarely concerns service sectors
Collaborator Type ⇨ Innovation	Rather weak	Ditto
Relationship Building	Very strong with many mature strands	Almost entirely quantitative and concerning industrial sectors.
Collaborative Working	Strong and mature	Fairly weak
Inter-organisational Networks	Strong and mature	Sound – both quantitative and qualitative and both private and public sectors.
Professional Networks	Rather weak	Non-existent

Source=Author

The relationship between collaboration and innovation is at the heart of this research. Although the evidence is consistently positive, it is almost entirely quantitative, and the operational measures are generally weak: additionally, there is an absence of qualitative studies, and especially a lack of exploration of decision making through the innovation journey. Furthermore, existing studies do not cover the public sector. There are similar weaknesses with regard to the complementary question as to which collaborator types contribute most to organisational innovation. Hence, a robust mixed methods approach to exploring the relationship between collaboration and innovation forms the basis for the first research question and associated set of research objectives.

The author felt that this was insufficient novelty for a PhD thesis and so a related, but more focussed, secondary topic was sought. The four themes concerning collaborative processes and structures, described in Sections 2.4.4 through 2.4.7 are candidates. However, in each of these themes, apart from professional networks, the theory is very strong and mature, and the empirical methodology is very sound although the contexts are rather narrow. They are not promising areas for further research. On the other hand, although existing material concerning professional networking is weak, it is a rather narrow and less interesting topic. Although these four themes have not been

chosen as the secondary topic, the theoretical and empirical material that makes up these themes has been used extensively in developing the detailed constructs for the primary research question.

It was decided to choose, in preference, the organisational learning / institutional conforming dichotomy as the secondary topic and this is fully explained and explored in Chapter Three.

2.5.3 Development of proposed research objectives in respect of RQ1

The first theme in Section 2.4 sought to establish a holistic relationship between collaboration and organisational innovation, without considering specific contingencies or theoretical angles. 13 studies were presented which, apart from one, give a positive association between collaboration and innovation. However, the studies have significant weaknesses in terms of both situation and methodology. In terms of situation, the studies are highly geared to industrial sectors, and often high technology industries. There is very little material related to service industries and none related to public service operations. This is important as the processes and characteristics of private sector and public sector innovation are very different, especially in terms of overarching objectives, decision making framework, structural factors and market factors – please see Section 6.2.3 of the Sector Background chapter.

In terms of methodology, 12 of the 13 studies consist of statistical analyses of national surveys or especially tailored surveys. In 8 of these 12 quantitative studies, the measures used for innovation and collaboration are extremely simplistic, often being binary indicators, derived from yes/no questions. Such a simplistic approach gives rise to questions about the validity of the measures. Only one paper is qualitative and although this paper does consider the form of and outcomes from collaboration, it does not explore the innovation process or innovation decision making. Furthermore, the context is logistics which is very different from tertiary education. The lack of qualitative studies related to collaboration and innovation has been noted by several writers (Greer & Lee, 2012).

This holistic perspective is fundamental to this thesis. It needs to be nailed down before more fine-grained research objectives are considered. To do this, it is proposed that both a quantitative and qualitative approach are used. The quantitative approach provides a perspective on the tertiary education population of organisations as a whole while the qualitative approach can provide a perspective on underlying processes, especially decision making during the innovation journey. As well as enabling different perspectives to be explored, this mixed methods approach also has methodological advantages in that if the findings from two such differing approaches are mutually corroborative, then such findings can be considered as more robust. In order to improve on the quantitative methodology found in existing studies, it is proposed to use multi-item constructs for both innovation and collaboration. In respect of the innovation construct, it is proposed to use the concept of an innovation space. And in respect of the collaboration construct it is proposed to use two dimensions – partner type and collaborative processes, respectively. These constructs are described in more detail later in this section. In order to facilitate the qualitative methodology, it is proposed to use the innovation journey framework developed in Section 2.3, which enables a structured approach to exploring the innovation process, especially innovation decision making.

Following from the above, two research objectives can be specified. One relates to a quantitative approach:

To identify whether collaborative behaviour influences strategic innovative behaviour.

and one relates to a qualitative approach:

To explore how and why collaborative behaviour influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

Complementary to the holistic perspective is the more fine-grained, yet also fundamental, perspective that considers which collaborator types make the greatest contribution to innovation. This was explored in the second theme. In the literature review 23 studies were analysed, 19 of which considered specifically which collaborator type has the strongest relationship with innovation. Overall, these studies

do provide further indicative evidence that collaboration is associated with innovation. However, the situational and methodological weaknesses in these studies mirror similar weaknesses in the holistic perspective studies. Regarding situation, nearly all of the studies mainly concern manufacturing firms, often high technology ones. While one study did involve only service firms, these were high tech software suppliers. Regarding methodology, all except three studies concern a quantitative methodology, either using simple measures or involving other weaknesses, and the three qualitative studies have situations that are not at all relevant to tertiary education or the innovation journey.

The question of collaborator partner type and innovation is complementary to the holistic perspective and is also at the heart of the topic of this thesis. Furthermore, it provides a more detailed focus and helps understand the underlying phenomena of collaboration and innovation. Therefore, partner related research objectives are proposed that mirror the two holistic research questions, related to a quantitative approach and qualitative approach, respectively. These research objectives would use the same quantitative constructs for innovation and collaboration and the same innovation journey framework as is used in the holistic research objectives.

Following from the above, two further research objectives can be specified, both at the granular level of collaborator type - one relates to a quantitative approach:

To examine whether collaborative type differentially influences strategic innovative behaviour.

and one relates to a qualitative approach:

To explore how and why each collaborator type influences decision in the pursuit of strategic innovative behaviour during the innovation journey.

Having identified the primary research objectives, more detailed work on their specification needs to be presented. In particular, three constructs need to be specified - the innovation space, collaborator types and collaboration processes. These are considered in the remaining part of this sub-section.

The first construct is an innovation space. The concept of an innovation space (invented for this thesis) is of a comprehensive generic portfolio of innovations pertinent to a specific sector. One can then assess how innovative an organisation is by measuring the spread and depth of coverage of this innovation space. In this thesis, an innovation space has to be developed relevant to tertiary education. The literature review provides a starting point in identifying the three-way categorization of product/service, process and organisational/commercial innovations. What is now needed is for each of these categories to be populated with a small number of current generic innovations applicable to the TES. Such a list does not exist in any learned journals and so it is proposed to compile it during a preliminary research exercise. This exercise and the resulting tertiary sector innovation space is described in Section 7.4.3.2.

The second construct is collaborator type. Existing studies are not helpful in specifying this construct for the TES. The concept of a supply chain is usually applied to private sector companies rather than public service organisations, but who are the customers and suppliers in tertiary education? Similarly, who are the equivalent of research organisations - presumably not other universities? Is the partner type – "competitor" - sufficient to encompass peers – what about peer group partners who are not competitors? And, very importantly for public service organisations, what about the role of the government as a partner? A list of collaborator types relevant to the TES is required. It is proposed to compile this list in the same preliminary research exercise described in the previous paragraph. This exercise and the resulting tertiary sector list of collaborator types is described in Section 7.4.3.3.

The third construct is collaborative processes. This is used to develop a measure for collaboration, the independent variable in the above research objectives. The literature review in Section 2.4 contains an in-depth consideration of this topic. It is proposed to formulate measures derived from elements of relationship building and collaborative working concepts. The operationalisation details are described in Section 7.4.3.3.

CHAPTER THREE

ORGANISATIONAL LEARNING AND INSTITUTIONAL CONFORMING

3.1 INTRODUCTION AND DEVELOPMENT OF RESEARCH OBJECTIVES IN RESPECT OF RQ2

The primary research question explored in Chapter Two, concerns organisational innovation consequent upon direct collaboration with partners. At the heart of this direct collaboration are the processes of scanning for opportunities, knowledge transfer and the evaluation, integration and exploitation of new knowledge. Essentially, this is the basis of the theory of organisational learning (Crossan, 2011; Easterby-Smith, 2011). An alternative approach, is where an organisation adopts an externally sourced innovation simply because it is perceived to represent the legitimate business practice in their sector. This is the essence of institutional theory (Greenwood et al, 2008; Scott, 2014).

Organisational learning and institutional theory are two highly prominent schools of thought in management theory. Both purport to explain, in very different ways, why organisations decide to change their products/ services, their processes and working practices and the way they organize themselves. Therefore, they are both highly relevant to the innovation theme in this thesis. In both theories, the ulterior purpose is organisational survival (Fiol & Lyles, 1985; Meyer & Rowan, 1977). In the case of

organisational learning, this is achieved through a pursuit of technical efficiency (Dodgson, 1993) and a feedback loop between organisational cognition and organisational behaviour (Levitt & March, 1988). In the case of institutional theory, this is achieved through a pursuit of legitimacy (Suchman, 1995), through responding to normative, coercive or mimetic institutional pressures to conform to sector norms (DiMaggio & Powell, 1983). (Strictly speaking, according to institutional theory, conformative behaviour does not apply to first movers (Tolbert & Zucker, 1983) – this is dealt with in Section 3.3.6.)

This chapter is a comparison of these two theories. On a matter of nomenclature, in order that the two theories are expressed in a similar grammatical form, the term organisational learning shall remain, but instead of institutional theory, the term institutional conforming is used. The ideas in the previous paragraph are summarised in Table 3.1.

Table 3.1 Characteristics of organisational learning and institutional conforming

	Organisational learning	Institutional conforming
Ulterior purpose	Survival	Survival
Motivational driver	To implement opportunities that optimise technical efficiency	To implement opportunities that optimise legitimacy
Behaviour	To continually adapt behaviour through cognition of internal feedback and external opportunities	To respond to coercive, mimetic and normative institutional pressures to conform to new working practices

Source=Author

It can be seen that both concepts have things in common – both have survival as the ulterior purpose and both recognise that innovative change is needed to achieve this purpose. However, their respective motivational drivers and behaviours are very different. Thus, there is a tension between the two concepts – a tension that has been explored hardly at all in the literature.

To what extent have these concepts been compared in existing literature? The first step is to identify any literature where organisational learning and institutional conforming are compared as motivational drivers (the first distinguishing feature of Table 3.1), ie whether organisations are driven more by technical efficiency or legitimacy. There is a

small amount of empirical work in this area in connection with early and late adopters (Westphal et al, 1997; Young et al, 2001; Roggenkamp et al, 2005; Kennedy & Fiss, 2009). These are all quantitative studies situated in a hospital context: they are analysed in detail later in this chapter. Kennedy & Fiss (2009) make the observation that prior to their study, the motivational drivers for technical efficiency and legitimacy had been poorly operationalized by proxy measures. The second step is to identify any literature where organisational learning and institutional conforming are compared in terms of behaviour (the second distinguishing feature of Table 3.1). No such empirical work has been found that compares the behavioural aspects of organisational learning and institutional conforming. This is not surprising as behavioural aspects of institutional conforming are rarely considered at all. To summarise, only a small amount of work has been conducted comparing the motivational drivers of organisational learning and institutional conforming, and only one piece of this empirical work uses well operationalized measures. That paper, by Kennedy & Fiss (2009), is quantitative and is not concerned at all with the innovation journey. No theoretical or empirical work has compared behavioural aspects of organisational learning with organisational conforming.

It is therefore proposed that this thesis compares the concepts of organisational learning and institutional conforming in a collaboration and innovation context. This is an interesting proposal and one that has not been explored in the literature to date. The research objectives that are proposed are designed to match those developed in Chapter Two. Hence two research objectives compare the two concepts, organisational learning and institutional conforming, in terms of the main variables – innovation and collaboration – using a quantitative approach and one research objective is somewhat deeper and explores underlying decision making in the innovation journey using a qualitative approach.

The two complementary research objectives which relate to a quantitative approach are:

To identify whether organisational learning or institutional conforming influence strategic innovative behaviour more.

To identify whether organisational learning or institutional conforming influence collaborative behaviour more.

and the one research objective which relates to a qualitative approach is:

To explore which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why?

As there is very little existing literature that directly compares organisational learning with institutional conforming, the approach adopted is to use existing literature on each of the two topics separately. For the quantitative analysis, the literature in respect of each of organisational learning and institutional conforming are distilled down to their key features and these features are used to formulate separate constructs and measures for organisational learning and institutional conforming, respectively. The distillation into key features is presented in Section 3.4 of this chapter and the formulation and operationalization of constructs is presented in Section 7.4.3.4. For the qualitative analysis, a method is needed to recognise and explain behaviour during the innovation journey as either relating to organisational learning or institutional conforming. This method is derived by applying the key features of each of organisational learning and institutional conforming, as presented in Section 3.4 of this chapter, to the innovation journey framework devised in Section 2.3. The resulting guidelines, which enable the characteristics of organisational learning and institutional conforming to be compared during the innovation journey, are presented in Section 5.2.2.

As a further justification for this thesis to adopt a mixed methods approach with a significant qualitative component, it is pertinent to analyses the nature of the empirical evidence for each of the stand-alone topics of organisational learning and institutional conforming. There is an abundance of literature on these topics, but it is mostly quantitative. With regard to organisational learning, in the early work, there was a very

low ratio of empirical studies to theoretical studies (Miner & Mezias, 1996). This changed in the late 1990s when there began an explosion of empirical work (Bapuji & Crossan, 2004). However, in their meta-analysis, Bapuji & Crossan (2004) found that of the 55 works examined, only 10 were qualitative and two were mixed methods. And in a recent trawl of on-line databases searching for empirical work concerning organisational learning, 21 studies were found that were published between 2010 and 2015, but only one of them was qualitative. This is relevant as several writers have mentioned the appropriateness of qualitative research to organisational learning (Miner & Mezias, 1996; Bapuji & Crossan, 2004; Argote, 2011). With regard to institutional conforming, a large number of studies have reported empirical investigations of some aspect of institutional theory. There has been one notable meta-analysis of institutional empirical work by Mizruchi & Fein (1999), focussing on DiMaggio & Powell's three influences. Mizruchi & Fein (1999) were critical of how these three influences had been operationalized. It is clear from their discussion of statistical manipulations, that all the empirical studies they reviewed were quantitative. Additionally, all the studies cited in this literature review are quantitative. In fact, several writers have lamented the dearth in qualitative studies. Greenwood & Hinings (1996) call for more explanations for underlying processes in institutional mechanisms and Boxenbaum & Jonsson (2008) say that how organisations experience institutional pressures is rarely explored. Heugens & Lander (2009) say that there is an overwhelming number of quantitative studies and yet the processual dimension is rarely explored. Suddaby (2010) said it was a huge puzzle to understand why organisations adopt processes and structures for meaning rather than productive value and that simply counting outcomes, as is done in most quantitative research, misses the crucial question of motivation. Finally, Kennedy & Fiss (2009) have commented that very little research has examined how efficiency versus legitimacy logics influences the implementation process.

3.2 KEY FEATURES OF ORGANISATIONAL LEARNING

The purpose of this section is to review the existing literature on organisational learning and to develop a distillation of the key features to use in formulating quantitative constructs and qualitative innovation journey characteristics. The section begins with identifying how literature was selected for this section and then goes on to

use this literature to set out the purpose of organisational learning, to introduce an outline of organisational learning and then to develop a more detailed exposition of the processes and features of organisational learning.

3.2.1 Sources of literature

Observing the chronology of the references used in this section, one might conclude that most of the key theoretical concepts underpinning organisational learning as a major school of thought in management theory were published in the three decades 1970 to 2000. However, although there was widespread acceptance of the notion of organisational learning during this period, there was no widely accepted model or framework (Fiol & Lyles, 1985). An explanation is that organisational learning is a topic of interest to many different disciplines, such as psychology, sociology, organisational behaviour, strategic management and production management (Shrivastava, 1983; Easterby-Smith, 1997). Further, there is rarely agreement within these disciplines, let alone between them (Dodgson, 1993a). This has resulted in inconsistent terminology and assumptions and little integration or accumulation of theory (Crossan et al, 1995). As recently as in 2011, Crossan et al were saying that the challenge of developing an accepted theory remains unresolved and that it is surprising how little recent theoretical development has occurred. (Crossan said this in a paper that was celebrating her winning the Academy of Management's award for the article of the decade). In fact, since 2000, the one notable new topic has been the development of the concept of psychological safety (Edmondson, 1999, 2008; Edmondson et al, 2001a, 2001b).

As this research requires the key features of organisational learning to be specified and as there is no authoritative framework, such a framework will be developed in this section. This framework is based on the concepts and models of the recognised leading writers in the field. These writers have been identified by referring to major summaries of organisational learning by Dodgson (1993a), Crossan et al (1995), Easterby-Smith (1997), Easterby-Smith & Lyles (2011), Easterby-Smith et al (2000, 2004), Argote (2011) and Argote & Spektor (2011)); in the Handbook of Organisational Learning and Knowledge Management, edited by Easterby-Smith & Lyles (2004); and by searching in leading on-line databases for works with the most citations.

The lack of a universally accepted framework also makes it important to carefully scope what is and what is not included within the boundaries of organisational learning in this thesis. In particular, there are three related topics which are outside of scope. The first topic is "the learning organisation", a concept first devised by Senge (1990). It is primarily a normative guide for how managers can encourage learning and innovation within their organisations, rather than a theoretical exploration of organisational behaviour (Easterby-Smith et al, 2000; Easterby-Smith & Lyles, 2004; Vera & Crossan, 2004; Scarborough & Swan, 2003; Edmondson & Moingen, 2005). The learning organisation concept is much wider in scope than organisational learning and is dealt with as a contextual factor under the heading "innovation support" in Section 4.4.2. The second topic outside scope is knowledge management, which, in terms of process, overlaps with organisational learning (Nonaka, 1994; Vera & Crossan, 2003), but which also includes the theory of knowledge (Blackler, 1995; Lam, 2000). The third topic outside scope concerns how individuals learn at work in informal communities-of-practice (Brown & Duguid, 1991, 2001; Lave & Wenger, 1991; Wenger, 1998).

3.2.2 The purpose of organisational learning

The underlying assumption is that organisational learning will improve an organisation's future strategic performance and that this will lead to long term survival (Fiol & Lyles, 1985). This requires an organisation to continually align itself with its environment, if necessary by strategic renewal (Fiol & Lyles, 1985), affecting the whole enterprise (Crossan et al, 1999). Such organisational adaptation requires management continually having to make strategic choices (Chakravarthy, 1982). These choices are a purposive endeavour to improve efficiency, productivity, innovativeness and competiveness, particularly when there is turbulence and uncertainty with regard to technological and market opportunities and threats (Dodgson, 1993a). Associated with these choices, an organisation will set itself targets against which it will measure its performance outcomes (Levitt & March, 1988; Aranda et al, 2017). Among the strategic choices to be made by an organisation is which innovations to adopt. There has been found to be a strong link between organisational learning and innovation and performance (Bapuji & Crossan, 2004). An organisational learning approach would

expect a full evaluation of the options, in terms of strategic alignment and technical efficiency. This would apply not only to the choice of innovations but also to the design approach (Westphal et al, 1997).

3.2.3 An outline of organisational learning

Two forms of input will be used to develop an outline of organisational learning. Firstly, the definitions of notable authors are considered. Definitions tend to give a somewhat simplistic picture, but they are useful here to identify what organisational learning is mainly about. The second input is a presentation and analysis of the significant features and concepts associated with the work of the major authors in the field.

Table 3.2 Definitions of organisational learning by notable authors.

Author	Definition
Argyris & Schon (1978, p.29)	"Organisational learning are processes in which members of the organisation act as agents for the organisation by detecting and correcting errors in organisational theory in use and embedding the results of their enquiry in private images and shared maps of the organisation."
Duncan & Weiss (1979, p.84)	"Organisational learning is the process within the organisation by which knowledge about action-outcome relationships, and the effect of the environment on the relationships, is developed."
Fiol & Lyles (1985, p.803)	"Organisational learning means the process of improving actions through better knowledge and understanding".
Levitt & March (1988, p.319)	"Organisations learn by encoding inferences from history into routines that guide behaviour."
Cook & Yanow (1993, p.386)	"Organisational learning is the acquiring, sustaining, or changing of inter-subjective meanings and/or the artificial vehicles of their expression and transmission, through the collective action of the group."
Edmondson (1999, p.353)	"Learning at the group level is an on-going process of reflection and action, characterised by asking questions, seeking feedback, experimenting, reflecting on results and discussing errors or unexpected outcomes or actions."
Friedman (2001, p757)	"Organisational learning is a process of enquiry (often in response to chaos or anomalies) through which members of an organisation develop shared values and knowledge based on past experience of themselves and others."
Holmquist (2003, p.98)	"Organisational learning is the social production of organisational rules based on experience that leads to changed organisational behaviour."

Source=Author

Generally, each of the above definitions has two parts – an organisational action and a subsequent learning outcome. Regarding organisational actions, there is considerable consensus amongst six of the eight definitions, that this consists of internal experience, ie of the organisation's own operational behaviour (Argyris & Schon, 1978; Duncan & Weiss, 1979; Levitt & March, 1988; Edmondson, 1999; Friedman, 2001; Holmquist, 2003). In two definitions, the organisational action involves the acquisition of knowledge from outside the organisation (Fiol & Lyles (1985) and Friedman (2001). Three of the definitions mention the trigger being recognition that the experience or the outcome is in some way unexpected (Argyris & Schon, 1978; Edmondson, 1999; Friedman, 2001). This is logical as one would not expect to learn from things not changing. In one definition, Cook & Yanow (1993), there is no organisational action in their definition, although this is a major feature when studying the detailed work of most of the other writers.

Regarding learning outcome, again there is considerable consensus. Five of the eight definitions mention cognitive maps in some form - Argyris & Schon (1978) mention shared cognitive maps, Levitt & March (1988) mention routines that guide behaviour, Cook & Yanow (1993) mention inter-subjective meanings, Friedman (2001) mentions shared values and knowledge and Holmquist (2003) mentions shared organisational rules. Slightly different to cognitive maps is the action-outcome inferences of Duncan & Weiss (1979). Only two of the definitions actually mention a consequential change in behaviour (Fiol & Lyles (1985) and (Holmquist, 2003), although most writers do in their detailed work.

The other point to note is that five of the definitions state that there is collective activity, rather than just activity by individuals acting alone (Argyris & Schon, 1978; Cook & Yanow, 1993; Edmondson, 1999; Friedman, 2001; Holmquist, 2003). Again, from an analysis of these writers' detailed work, one would expect all definitions to mention that organisational learning is a social/ collective endeavour.

Overall, the definitions identify organisational learning to mean the acquisition of knowledge from internal experience, especially unexpected experience, possibly together with external knowledge and to make sense of this collectively and to thereby

develop cognitive maps, which guide future behaviour. This provides a starting point for understanding what organisational learning is about.

The next step is to present and analyse the significant features and concepts associated with the detailed work of major writers in the field – please see Table 3.3. This provides a fuller outline of organisational learning than found in the definitions and paves the way for the detailed exposition in the following sub-section.

Table 3.3 The features and concepts of organisational learning of notable authors

Authors	Significant features and concepts associated with their work.
March *	• Experiential learning leads to incremental modifications to organisational routines. • There are various organisational problems that limit the organisation acquiring and interpreting correctly internal and external input knowledge.
Argyris & Schon (1978)	• Individuals monitor behavioural performance in order to detect and correct errors. • Detection and correction can be at operational and strategic levels. • Self-deception on the part of managers often limits the accurate detection and correction of strategic level errors.
Daft & Weick (1984)	• Organisations interpret the meaning of new external knowledge and internal experiential feedback resulting in changed or new cognitive maps. • An organisation's strategy for acquiring external knowledge can be modelled in a 2x2 matrix with one dimension being the analysability of the environment and the other dimension being whether the organisation is reactive or proactive.
Huber (1991)	• Organisations acquire, interpret and store information and knowledge in organisational memories.
Kim (1993)	• Kim developed a widely quoted model that adds nothing new, but does encapsulate all key features of a universal organisational learning model.
Nonaka (1994)	• This model depicts the cycle of knowledge processing within an organisation between individuals, groups and systems, in terms of tacit and explicit knowledge.
Crossan (1999)	• Individuals gather and make sense of knowledge, and then groups make collective sense of it and apply it in context and then the organisation embeds change into systems.

Authors	Significant features and concepts associated with their work.
Argote (2012)	• This is included as it is the only recent new model. It adds relatively little that is new, except for emphasising the organisational and environmental context.

March * is associated with several partner authors over a long period. The references particularly relevant to this topic are: March & Simon (1958), Cyert & March (1963), March & Olsen (1975), Levitt & March (1988) and Levinthal & March (1993).
Source=Author

The first stage in the organisational learning cycle is the acquisition of internal and external knowledge. This is a feature of all eight writers, although in two instances, Argyris & Schon (1978) and Nonaka (1994), the acquisition is not explicit. The second stage is some aspect of making sense of the acquired knowledge. (Sense-making, interpretation and reflection, effectively, are synonyms.) The outcome of sense-making is cognitive maps – these enable the organisation to make decisions Sense-making and some form of cognitive map is a feature of all eight models, although in one instance, Argote (2012), the process is not explicit. Two authors, March* and Argyris & Schon (1978), include the significant limitations of managers in this sense-making process. Sense-making and the development and use of cognitive maps is a shared, collective activity. This is recognised by all eight writers. Where there is some disagreement is over whether the process is an aggregation of processes involving individuals or whether there is in some sense a collective process.

A historical distinction between writers has been whether they emphasise cognitive or behavioural elements in the organisational learning process and how they treat the feedback cycle between the two. Cognition includes the processes of knowledge acquisition, sense-making and collective sharing, whilst behaviour includes processes, such as setting targets, implementing change and operational activities. A cognitive-behaviour feedback cycle is a feature of six writers - Daft & Weick (1984), Huber (1991), Kim (1993), Nonaka (1994), Crossan (1999) and Argote (2012)). In the instances of Huber (1991) and Daft & Weick (1984), their models do incorporate action, but it is only action directly associated with cognition activities and not behavioural action as defined here. The link between cognition and behaviour, and between cognition at different times or in different places, is provided by organisational

memory, which mainly consists of shared cognitive maps, that enable decisions to be made, and organisational routines, that enable processes to be carried out.

Finally, it is worth noting the excellent series of articles by Edmondson (Edmondson et al, 2001a, 2001b; Edmondson, 2003a) concerning the related topic of team learning during the introduction of new technology in hospitals.

3.2.4 Organisational learning processes and features

This section builds on the outline presented in the previous section by specifying in more detail the key processes and associated components of organisational learning.

3.2.4.1 Gathering new knowledge

According to Huber (1991), the first step in the organisational learning cycle is to gather new knowledge. This new information is combined with existing knowledge in the organisation's memory and sense is made of it. New knowledge is acquired from feedback from internal cognition and behaviour and from knowledge in the external environment.

There are two main sources of new internal knowledge. Firstly, there is feedback from how well an operation is being performed (Cyert & March, 1963). This may be from observance, or, from self-appraisal (Huber, 1991). Feedback is from development as well as operational activities. Secondly, there is feedback from the measurement of how well performance outcomes are meeting targets (Cyert & March, 1963).

With regard to external knowledge, organisations are porous social systems and knowledge flows to and from the external world from several sources (Daft & Weick, 1984). This is essential for the process of continual strategic renewal (Fiol & Lyles, 1985). Some of this knowledge is of a general nature – for example, technological and market trends (Daft & Weick, 1984; Huber, 1991) or benchmarks (Miner & Mezias, 1996). On the other hand, some of this knowledge is more specific and focussed – for example vicarious learning from the experience of other organisations (Levitt & March, 1988; Miner & Mezias, 1996), from joint inter-organisational working (Bapuji &

Crossan, 2004) and from seeking stakeholders' requirements (Huber, 1991). Huber (1991) uses the generic term scanning to summarise searching the environment for new opportunities and threats.

In addition, some types of knowledge come from a mix of internal and external sources. An important example is where there is an insightful re-combination of currently fragmented information. Nahapiet & Ghoshal (1998) describe this re-combination in their description of the benefits of social capital and Crossan et al (1999) describes individuals recognising patterns and possibilities in a stream of personal experiences. These re-combinations are examples of what Huber (1991) calls haphazard learning as it is often characterised by serendipity. Another example where knowledge may be from internal or external sources is where an organisation may undertake experiments to test operational propositions (Huber, 1991; Miner & Mezias, 1996). Research and development is an example of internal experimentation and test marketing is an example of external experimentation (Huber, 1991). A further example of a mix of internal and external sources is where somebody is recruited from outside to become a permanent member of staff because of their unique know-how.

3.2.4.2 Making collective sense of the new knowledge

Having acquired new knowledge, the organisation must make sense of it by interpreting and reflecting on it (Weick, 1995). Daft & Weick (1984) defined interpretation as the "process through which information is given meaning" (p.294). Much later, Weick et al (2005) said that "Sensemaking involves the ongoing retrospective development of plausible images that rationalise what people are doing" (p. 409). Sense-making also concerns identifying cause and effect inferences from operational and experimental action-outcome relationships (Daft & Weick, 1984; Fiol & Lyles, 1985). According to Daft & Weick (1984) and Weick et al (2005), the need for this sense-making tends to occur when inputs are equivocal, or outcomes are unexpected. Organisations then need to ask themselves what is a new piece of knowledge, how does it compare with other pieces they already know about and how does it fit within the context of their specific organisation and environment at this specific time and, most importantly, what should they do about it. Daft & Weick (1984) believe that it is in moments of crisis that sense-making is most urgent. In terms of

mechanics, they see three steps: sense-making starts with noticing and bracketing, ie pigeon holing useful snapshots of experiences; applying these retrospective snapshots to the new situation; and then integrating these snapshots into some systematic and socially accessible memory. Daft & Weick (1984) believe that it is senior management who lead the process with the aim of achieving organisational coherence and convergence in organisational interpretation. On the other hand, some writers have emphasised the consensus nature of sense-making. For example, Dougherty et al (2000) refers to the social process of developing a common, shared cognitive map and Crossan et al (1999) describes the process as one of continual dialogue at all levels and co-ordinated action through mutual adjustment.

This is an example relating to the historical debate concerning the respective roles of individuals vis-à-vis the collective organisation in organisational learning. The consensus view is that the starting point for organisational learning is the individual (March & Olsen, 1975; Argyris & Schon, 1978; Shrivastava, 1983; Dodgson, 1993a; Crossan et al, 1999). Through a process of aggregation, this individual learning becomes shared cognitive maps and organisational routines (Argyris & Schon, 1978; Kim, 1993; Crossan et al, 1999) that are more than the sum of the parts (Fiol & Lyles, 1985; Dodgson, 1993a). As Hedberg (1981) said, "organisations do not have brains, but they have cognitive systems and memories…..members come and go and leadership changes, but organisational memories preserve certain behaviours, mental maps, norms and values over time" (p. 6). An example of organisational learning being very distinct from individual learning is the concept of core competences (Prahalad & Hamel, 1990) and dynamic capabilities (Teece et al, 1997). On the other hand, Cook & Yanow (1993) are perhaps the foremost exponents of the view that organisations can learn in their own right. They counter arguments that group learning cannot be observed, by giving illustrations of a basketball team and a symphony orchestra. They argue that what one sees is not a collection of individuals but the relationships between individuals, a coherent set of behaviours and a group purpose. Above all, they say that the group acquires group know-how. Cook & Yanow (1993) state it is the concept of culture that explains collective behaviour, group know-how and organisational learning. They provide a vivid illustration of this concept of organisational culture and learning in practice by describing a Boston firm of flute makers. A sequence of craftsmen builds each flute. Each craftsman has learned over time, by mutual

interaction, if and when a Powell flute is "right" – "not by explicit measurement but by tacit hand to hand judgements of feel and eye" and by a "parsimony of verbal interaction" (Cook & Yanow, 1993, p.382) – this despite the fact that every flute is unique.

Several different names have been given to these collective meanings that result from this activity. Daft & Weick (1984) call them cognitive maps, Senge (1990) calls them mental models and Edmondson (2003b) calls them frames. They are a set of assumptions and beliefs about a particular entity and situation. They are plastic in as much as they are being continually refined in order to make them more comprehensive, plausible and resilient (Weick et al, 2005). Sometimes, new knowledge is so radically different from meanings in the existing cognitive maps, that a process of unlearning is required, where old knowledge needs to be consciously discarded to make way for a new cognitive map (Hedberg, 1981). A cognitive map will be stronger if it has breadth, ie it is shared by most units in the organisation, and depth, ie if in coming to a consensus, a diversity of perspectives are reconciled (Huber, 1991; Fiol, 1994). Strong organisational cognitive maps can endure despite the turnover of staff (Daft & Weick, 1984). A complex organisation would have a series of cognitive maps, such as an awareness of an emergent customer need or how a material might deliver a certain level of performance (Dougherty et al, 2000). The complex entanglement of cognitive maps makes the collective development and sharing of them much more difficult (Dodgson, 1993a).

There can be very different styles associated with cognitive maps. Hayes & Allinson (1998) provide the following examples. One style might involve gathering as much data as is possible, carrying out a detailed analysis and using several techniques to make a considered decision. This style might be appropriate for pharmaceutical companies researching new drugs. Another style, might just involve quickly gathering a few hard facts and making inspired guesses. This style might be appropriate for security personnel facing a sudden and potentially dangerous situation. Chien et al (2015) have developed a framework of organisational learning styles depending on whether an organisation has weak or strong internal capacity and weak or strong external relationships.

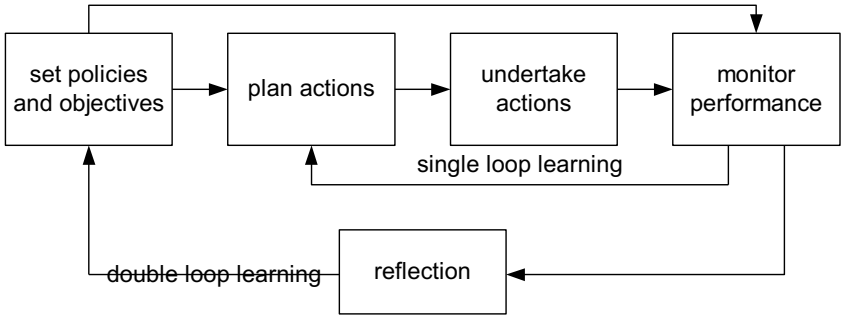
The substance of shared cognitive maps is shared knowledge. A model of how knowledge becomes shared has been developed by Nonaka (1994) and Nonaka et al (2000a, 2000b, 2001. Nonaka's (1994) ideas build on those of Daft & Weick (1984) – both talk about tacit and explicit knowledge, a distinction originally developed by Polanyi (1997); both see the importance of linking layers of an organisation; and both see tension as a catalyst. Nonaka's(1994) model is based on a continuous cycle of transfers between tacit (subjective and experiential) and explicit (objective and structured) knowledge. According to Nonaka et al (2001): socialization, ie tacit to tacit, happens between individuals when they are sharing experiences with others – for example, a sales assistant talks to customers and assimilates tacit knowledge about demand; externalization, tacit to explicit, happens in teams where abstract ideas are made explicit – for example, the sales assistant discusses demand with other assistants and collectively they create explicit orders for new stock; combination, explicit to explicit, happens, for example, in meetings, in the processing of documents and in computer systems – for example the resultant stock position is matched against sales and this transformed explicit knowledge is fed back to the store; and internalization, ie explicit to tacit, happens when a concept is brought to life by action ie by doing it for example, the sales assistant reflects on this feedback and accumulates further tacit knowledge. Important characteristics of the knowledge sharing process are openness and transparency, participation and psychological safety (Nevis et al, 1995; Marchand et al 2000; Friedman et al, 2001; Edmondson, 2001, 2003b). The latter is an environment where individuals feel they can speak up about issues without fear of victimisation.

The glue that ensures cohesion and continuity in the organisational learning process is organisational memory. There are two components of organisational memory – cognitive maps and operational routines (Daft & Weick, 1984; Levitt & March, 1988; Walsh & Ungson, 1991). These are, of course, abstract concepts – they may, or may not, have physical presence. Cognitive maps were discussed earlier in this section. Feldman (2000) defines organisational routines as "repeated patterns of behaviour that are bound by rules and customs and that do not change very much from one iteration to another" (p.611), although Pentland & Reuter (1994) argue that routines are not necessarily a single pattern but a repertoire of patterns from which are selected ones to meet current circumstances.

3.2.4.3 Single and double loop learning

Cognition can be at an operational level or at strategic level. In the former, corrections are made to faulty operations, ie doing things right, while in the latter, corrections are made to faulty goals, ie doing the right things. This concept was developed by Argyris & Schon (1978) under the name single loop/ double loop learning, as depicted in Figure 3.1.

Figure 3.1 Single and double loop learning model



Source= based on Argyris & Schon (1978)

Single loop learning places an emphasis on improving techniques and making these efficient (Argyris & Schon, 1978) and relates more to repetitive routines (Fiol & Lyles, 1985). These changes tend to be incremental and reactionary (Bettis-Outland, 2012). On the other hand, double loop learning involves changes to goals, values and frameworks (Argyris & Schon, 1978). Double loop learning involves insights and is more cognitive than single loop learning (Fiol & Lyles, 1985). Double loop learning is often in response to a crisis (Miller & Friesen, 1980). Argyris & Schon (1978) thought that senior managers have considerable difficulty in recognising strategic level behavioural errors. This topic has been developed into how organisations learn from success and failure (Starbuck & Hedberg, 2001) and, indeed, how they sometimes do not learn from failures (Tucker & Edmondson, 2003).

3.2.3.4 Difficulties in the organisation learning process

There has been a considerable focus in the literature on the difficulties organisations face in the organisational learning process. Firstly, there are problems concerning sense-making. These include difficulties with interpreting information when there is ambiguity and difficulties with disentangling cause-effect relationships in complex circumstance or when there is a lot of noise (March & Olsen, 1975; Crossan et al, 1995). Secondly, there are problems caused by short sighted decision making – for example, in seeking short term solutions, or convenient solutions or failing to learn the lessons from failure (Levitt & March, 1988). Thirdly, there are problems of self-deception. Argyris & Schon (1978) said that it was commonplace for senior managers to fail to recognise when their pet projects are failing. They said that it led to operational tinkering instead of strategic excision. Finally, when an organisation becomes very experienced in carrying out a function they may become so efficient that they overlook new opportunities. Levitt & March (1988) called this the competency trap.

3.3 KEY FEATURES OF INSTITUTIONAL CONFORMING

The purpose of this section is to review the existing literature on institutional conforming and to develop a distillation of the key features to use in formulating quantitative constructs and qualitative innovation journey characteristics. The section begins with identifying how literature was selected for this section and then goes on to use this literature to introduce an outline of institutional conforming and then to develop a more detailed exposition of the key features

3.3.1 Sources of literature

One of the major paradigms in management theory for many years was structural-contingency theory, which was centred around agentic choices to adapt to a changing environment, particularly where there are rapidly changing technological opportunities (Greenwood et al, 2008; Scott, 2008). This was challenged by Meyer & Rowan (1977) and DiMaggio & Powell (1983) in what became known as neo-institutional theory.

The essence of their theory, is that organisational forms and practices reflect the norms prevailing in their field and by conforming with those norms, an organisation gains legitimacy, stability and enhanced chances of long term survival. Furthermore, in time, organisations in the field inexorably converge on a standard organisational template. It was DiMaggio & Powell (1983) who developed the idea of coercive, mimetic and normative influences as the three basic mechanisms that enable this isomorphism.

The key features of institutional conforming need to be identified for this thesis. These features are based on referring to major summaries of institutional theory by – Scott (1987) and Suddaby (2010); the Handbook of Organisational Institutionalism (Greenwood et al, 2008); the leading text book in this field "Institutions and Organisations" (Scott, 2014); and by searching in leading on-line databases for works with the most citations.

This thesis is at the organisational level of analysis. Much of institutional theory concerns the institutional process of isomorphism in fields and is therefore out of scope, as is micro-foundational aspects, such as developed by Zucker (1977). It should also be noted that at the individual level within an organisation, conformity is a very different topic. Even in an empowered organic culture, individuals would be expected to innovate only within the corporate vision, policies and frameworks (Smith, 2011).

3.3.2 An outline of institutional theory

Meyer & Rowan (1977) said that it is both the complexity of modern organisational networking and exchange together with the greater awareness of institutional conventions and norms, that define what it is to behave and interact rationally and which have led to conformity in organisational structures and working practices. Meyer and Rowan (1997) define institutionalization as "the processes by which social processes, obligations or actualities come to take on rule like status in social thought and action" (P.341). Their theory is that the formal structures of organisations are not contingent on technical/ market factors or associated with the aim to be technically efficient. Instead, organisational forms and practices reflect the "taken-for granted" "myths and ceremonies" of their institutional environment, ie they reflect the common understanding of what is appropriate behaviour. Conforming with these norms

provides an organisation with legitimacy, in the eyes of critical stakeholders, and stability (Scott, 1983). Meyer & Rowan (1977) go on to say that the resulting formal structures are not necessarily the best technically for the organisation. Therefore, in order to perform adequately, the organisation will maintain a legitimate and overt formal structure and, simultaneously, a technically efficient but covert informal structure. They called this separation "decoupling". Meyer and Rowan (1977) also set out the idea of the two-stage innovation diffusion cycle – whereby early adopters of an innovation would evaluate an innovation using technical efficiency criteria and later adopters would evaluate an innovation using legitimacy criteria. DiMaggio & Powell (1983) thought that late adopters would behave in this way particularly if there is uncertainty over the efficacy of the innovation.

DiMaggio & Powell (1983) extended the theory in two important aspects. Firstly, they narrowed the scope of isomorphism to an organisational field – similar to, but not necessarily synonymous with, an industrial sector. Secondly, they identified three categories of isomorphic pressures – coercive, mimetic and normative. It is this concept that has received most subsequent attention and, indeed, has almost become synonymous with institutional theory (Mizruchi & Fein, 1999). DiMaggio & Powell (1983) identify three mechanisms of influence: coercive influence is caused by those with political or resource power; mimetic influence is where organisations model themselves on leading peer group organisations; and normative influence is through professionals, from their authority over a specific domain of knowledge and working practice and the legitimacy this brings. These mechanisms of influence are a key feature of institutional theory.

Later writers advance specific branches of the theory, such as Suchman (1995) concerning legitimacy, Abrahamson et al (1991, 1993, 1996) concerning bandwagons, Oliver (1991) concerning possible agentic responses, Battilana (2006) concerning institutional entrepreneurialism and Thornton & Ocasio (2008) concerning institutional logics. According to Greenwood et al (2008), institutional theory dominates submissions to the Organisation & Theory Division of the Academy of Management.

Since the original theory was first put forward, there has been a gradual softening of some of the propositions. Firstly, while organisations may not put technical efficiency

aims first, this does not mean they are not being rational. Sometimes, pursuing aims of legitimacy may be very rational. Secondly, there was an implication that an institutional norm would be easily recognised and defined. It is now understood that the institutional space is pluralistic and likely to be in conflict and that, therefore, there is not one unambiguous model to which to conform (Scott, 2008b; Raynard, 2016; Smith & Tracey, 2016). Furthermore, organisations have a choice – whether to conform or not and, if they conform, which model they conform to (Scott 2008b). In fact what DiMaggio & Powell (1983) say in their original paper, is that bounded rationality reduces choice to options within the institutional norms, not that there are no choices at all. Given this plurality of models and the fact that organisations have a choice, it follows that the existence of institutional pressures does not mean necessarily that there will be eventual sectoral convergence (Greenwood et al 2008). In fact, Ashworth et al (2007) found evidence for conformity, but not for convergence. They posit this is because organisations do conform on some matters but not on others and that it is on those matters on which there has been conformance, that most studies have concentrated. Ocasio & Radoynovska (2016) suggest this leads to sector heterogeneity and not sector convergence. The final topic where the original theory has been diluted is that organisations are now not considered actually to have both overt and covert decoupled structural forms as was originally proposed by Meyer & Rowan (1977) and Scott (2008b).

3.3.3 Legitimacy

The concept of legitimacy is fundamental in institutional theory. It explains the driving force for change in the same way that technical efficiency does in organisational learning. Suchman (1995) defines legitimacy as "a generalised perception or assumption that the actions of an entity are desirable, proper or appropriate within some socially constructed system of norms, values, beliefs and definitions" (P 574). It is clear that Suchman believes that legitimacy is subjective rather than objective, depends upon a collective audience and is resilient to particular events.

The collective audience is the organisation's stakeholders. Freeman (2004) defines these as "any group or individual who can affect or can be affected by the achievement of the organisation's objectives" (p229). An organisation typically has multiple

stakeholders, each with their own perspectives of legitimacy. Consequently, an organisation may have to balance conflicting pressures (Kraatz & Block, 2008). For example, Souitaris & Zerbinati (2012) quote the example of a subsidiary business unit having to meet the legitimacy requirements of both the conglomerate parent and their specific industry sector. In an empirical study specifically in the HE sector, Alcarcon-del-Amo et al (2015) found that performance improved (ability to raise funds, improve service quality and enhance reputation) if a university responded to stakeholders' explicit current needs and anticipated future needs.

3.3.4 Coercive, mimetic and normative influences

Mayer & Rowan (1977) focussed on organisations being driven to behave appropriately according to their respective institutional environments. DiMaggio & Powell (1983) developed this theory by identifying three specific external pressures - coercive, mimetic and normative - that provide the incentive for organisations to conform and evidence to stakeholders that they are behaving appropriately. Later, Suchman (1995) in his detailed treatment of legitimacy and Scott (2014) in his "three pillars of institutions" (p.60) categorised these influences somewhat differently.

Coercive influence is enacted by those with power. The most common example is the Government, and its agencies, who may mandate change or issue regulations about change or issue licenses to operate (DiMaggio & Powell, 1983). There are other authorities as well, such as the courts (Scott, (2008) and parent companies over subsidiaries (DiMaggio & Powell, 1983). A feature of authorities is that they may be able to sanction rewards for compliance and punishments for non-compliance (Scott, 2008). Another example of power is where one party holds scarce resources – ie resource dependency. Almost identically equivalent to DiMaggio & Powell's (1983) coercive category is Scott's first pillar, which he labels "regulatory" and Suchman's (1995) pragmatic legitimacy. The latter rests on the self-interested assessment by a stakeholder of their direct contact and exchanges with the prime organisation, for example, a regulator has a self-interest that organisations adhere to its regulations.

Mimetic influence is where organisations model themselves on other organisations, usually because these other organisations are in the same field and are recognised as

being successful (DiMaggio & Powell, 1983). It is especially likely to occur when there is uncertainty, for example if a new technology is poorly understood (DiMaggio & Powell, 1983). Neither Scott (2014) or Suchman (1995) have an equivalent category, although most empirical studies include this mimetic influence (Mizruchi & Fein, 1999).

According to DiMaggio & Powell (1983, a normative influence is through professionals. Professional power comes from their authority over a specific domain of knowledge and working practice and the legitimacy this brings (DiMaggio & Powell, 1983). DiMaggio & Powell (1983) say there are two forces of professional isomorphism: the legitimation of a cognitive base acquired through formal university or professional education and training; and the growth of professional networks. Professional power is maintained by filtering personnel into a profession and restricting working practice only to people with professional qualifications (DiMaggio & Powell, 1983).

Scott's (2014) interpretation of normative is very different from that of DiMaggio & Powell (1983). Scott's (2014) second and third pillars are labelled "normative" and "cultural-cognitive" respectively, although both these categories have normative characteristics and are treated under the normative heading in this thesis. Scott (2014) includes under his "normative" pillar, any obligation or sector standard that is consciously followed by an organisation. This includes formal industry standards and informal industry conventions such as model roles and model procedures. These pressures are less enforceable than the coercive ones. This is a very useful extension of the meaning of normative, beyond DiMaggio & Powell's (1983) rather narrow and perhaps out-of-date focus on professional standards. Scott defines his "cultural-cognitive" pillar in rather sociological/anthropological terms such as identity and symbolic meaning, without giving any concrete examples. Probably, he means it to equate to Meyer & Rowan's (1977) idea of myths, ie unconscious frames of reference. Certainly, it would be useful to have a meaning of normative that focusses on societal moral norms – for example, what is reasonable top executive pay. However, it is not clear that this is what Scott is getting at.

As well as pragmatic legitimacy, Suchman (1995) has two further categories of legitimacy, which both have normative characteristics and are treated under the normative heading in this thesis. His cognitive legitimacy rests on a stakeholder finding the behaviour of the prime organisation to be plausible, especially in a complex world, in terms of conforming to accepted norms for doing things; while his moral legitimacy rests on altruism, that the stakeholder believes that the prime organisation is fulfilling some societal obligation by doing the right things. Suchman's (1995) cognitive and moral legitimacy are sub-divisions of DiMaggio & Powell's (1983) "normative" pillar.

Finally, an important study by Haunschild & Miner (1997) focuses on mimetic influences. They categorise three types: i) imitating a practice adopted by a peer organisation which is a sector leader with a reputation for successful innovation – this is the same as DiMaggio & Powell's (1983) meaning of mimicry; ii) imitating a practice that has already been adopted by a majority of peers in the sector – effectively this is conforming to the sector norm and is taken in this thesis as being an important example of normative influence; iii) imitating a practice that has been proved efficacious by a peer – this is not blind conforming but vicarious learning and, in this thesis, is regarded as a characteristic of organisation learning.

Thus, to summarise, the interpretation of the three institutional pressures in this thesis is:

Coercive pressure is from the government and powerful partners or parent bodies who have control over regulation/ certification and the allocation of funds and other resources.

Mimetic pressure is in respect of peer group competitors who are first movers and who are imitated because of their reputation for their business performance or past innovation performance.

Normative pressure is where an innovation is already a sector norm and has been implemented by a majority of peers, or where there is conventional adherence to industry standards, or where standards are set by professional bodies, or recognised stakeholder expectations or societal moral expectations.

The literature may imply that coercive is synonymous with government; mimetic is synonymous with peers; and normative is synonymous with sector interests. This 1:1 correspondence need not necessarily be the case as the examples in Table 3.4 illustrate.

Table 3.4 Examples of mapping institutional pressures onto types of external player

Institutional Forms➔ Pressures ↓	Government	Peer group organisations	Sector/ professional interests
Coercive	Regulation, Tied funding	Resource dependence	Regulatory standards for practice
Mimetic	Promotion of centres of excellence, eg Beacons	Vicarious learning	Competence based imitation
Normative	Pushing evidence-based practice	Mimicry to achieve legitimacy	Socialization through training

Source=Author

3.3.5 Bandwagons

The notion of bandwagons came to prominence in the 1980s and 1990s, with the rise of a stream of management innovations that purported to be the elixir of high business performance. These innovations included matrix structures, total quality management, business process re-engineering and downsizing. Bandwagons are partly mimetic and partly normative. Abrahamson (1991) identifies two variants: fads are where an organisation imitates other organisations in their peer group; fashions are where the stimulus for change comes from consulting firms. Abrahamson (1996) defines a management fashion as "a relatively transitory collective belief, disseminated by management fashion setters, that a management technique leads to rational management progress." (p.257). The assumption for both fads and fashions is uncertainty (Abrahamson, 1991). Presumably, this is because proving their efficacy would be extremely difficult, because fads and fashions tend to be rather abstract concepts and the benefits are often long term and difficult to disentangle from other initiatives or environmental circumstances.

Whereas early adopters take a speculative risk in adopting one of these innovations, the motivation for later adopters is because many other peer group competitors have already adopted the innovation and they fear that inaction would lead to a loss of competiveness or legitimacy. As these fads and fashions would be discussed widely in the business world, stakeholders would also believe that they could be an efficient means to important ends (Abrahamson, 1996). For mid/ late adopters, the important consideration is not what the innovation is, but who, with a high reputation in the industry, has already implemented it (Abrahamson, 1996).

According to Abrahamson (1991), bandwagons are actually harmful as they are technically inefficient administrative technologies. This seems somewhat of a generalisation and has not been demonstrated empirically. Abrahamson et al (1993, 1997) also states that such is the pressure to conform that an organisation may well adopt a fad or fashion even if they expect negative returns. Fiol & O'Connor (2003) consider that bandwagons are an example of a lack of mindfulness on the part of senior management. They believe that it is not information that is in scarce supply, but management attentiveness. However, an empirical study by Staw & Epstein (2000), showed that companies implementing popular management techniques improved their reputation, in as much as they were perceived to be more innovative and rated higher in the quality of their management, but in fact did not enjoy a higher economic performance. So, although this does not show that bandwagons are harmful as suggested by Abrahamson (1996), it does show that they have a placebo like effect with stakeholders.

3.3.6 First movers

One of the propositions, associated with institutional theory, is that first movers are driven by the need for technical efficiency – due to pre-emptive competitive advantages (Lieberman & Montgomery, 1988 & 1998), whereas later adopters, ie the major bulk of adopters, are driven by the need for legitimacy (Meyer & Rowan, 1977). Tolbert & Zucker (1983), in a study of the implementation of local government reforms, demonstrated that later adopters are indeed influenced by institutional pressures towards seeking legitimacy.

Since Tolbert & Zucker's (1983) study, four studies have covered this topic, all set within large USA based multi-hospital systems. Westphal et al (1997) investigated the implementation of total quality management. They found that technical efficiency drives early adopters and coercive, mimetic and normative influences drives the pursuit of legitimacy in later adopters. They believed that social networking facilitated both effects. In the case of early adopters, social networking provided hospitals with a range of solutions from which they could chose the one with the best fit and, in the case of later adopters, by which time a standard total quality management template had emerged, social networking provided hospitals with the specification of the standard template. The Westphal et al (1997) methodology assessed the degree of congruence according to how many of 20 features of the total quality template a hospital had implemented. This indicates that conformation does not just mean implementing a broad interpretation of an institutionalised innovation, but means implementing what has coalesced to become the standard design. Two further studies in hospitals were conducted by Young et al (2001) and Roggenkamp et al (2005), both confirming the original proposition.

The fourth and final empirical study was a re-run of Westphal et al's (1997) data by Kennedy & Fiss (2009). They made an interesting observation that prior to their study the motivational driver for technical efficiency or legitimacy had been rather poorly operationalized by proxy measures. They maintain that motivation should be measured by offering study participants a range of specific drivers, ie generic reasons to adopt an innovation, which can be allocated to one or other of the two categories of technical efficiency and legitimacy. Their measures are discussed in Section 2.3.3 of this thesis where a template for the innovation journey is developed, including specifically criteria to justify the innovation adoption decision.

Kennedy & Fiss (2009) also introduce the notion that technical efficiency and legitimacy are relevant to both early and later adopters. This is set out in Table 3.5. In their view, the difference between the two is that early adopters are motivated by opportunities, whereas later adopters are motivated by threats. This is interesting because it introduces the idea that organisations could be driven by organisational learning and institutional conforming simultaneously.

Table 3.5 Motivations for adopting innovation

Motivation ➔ Decision logic ↓	Early adopters motivated by opportunities…	Later adopters motivated by threats…
Technical efficiency	…for economic gains from first mover advantages	…of economic losses because of performing below the new norm
Social legitimacy	…for social gains from being the market leader and gaining the approval of customers	…of the loss of legitimacy because of not adopting normal behaviours

Source= based on Kennedy & Fiss (2009))

3.3.7 Agency choice

An important debate in institutional theory has been how much choice can a senior manager have in the face of institutional pressures. This echoes the wider debate between voluntarianism and determinism (Hrebiniak & Joyce, 1985; Miller, 1996). For example, bounded rationality leads to constrained efficiency and therefore the capacity to choose from fewer options (Cyert & March, 1963; Roberts & Greenwood, 1997; Roggenkamp et al, 2005). In fact, this is likely to match the institutional situation, where there are likely to be a range of acceptable designs, not just one, from which managers can chose (DiMaggio & Powell, 1983; Roberts & Greenwood, 1997). In their meta-analysis, Heugens and Lander (2009) found that organisations enjoy at least some discretion in responding to institutional pressures.

Oliver (1991) suggests there are five generic responses that senior managers can make to institutional pressures: i) acquiesce and comply with the norms; ii) compromise, by negotiating with and balancing the respective demands of different stakeholders; iii) loosen institutional attachments or disguise non-conformity; iv) contest the rules; v) manipulate institutions and stakeholders or co-opt influential partners. This range of options implies that institutional pressures are not the iron cage postulated by DiMaggio & Powell (1983). Oliver (1991) shows that managers do have a choice. If they discover a good idea, which is plausible and, preferably, testable (Beckert, 1999), then they can choose to pursue the good idea rather than conform. This is a risk as it may alienate stakeholders. On the other hand, the differentiation may lead to greater competiveness (Zhao et al, 2017).

There are situations that may dilute institutional pressures on senior management decisions. For example, there may be many different institutional stakeholders with differing legitimacy perspectives which may not be coherent and even in conflict (Beckert, 1999). This calls for discretionary behaviour. Another example is that there will be less pressure to conform if the power of stakeholders is weak and/or there is perceived to be a weak association between conformity and legitimacy (Oliver, 1991). A final example is the powerful position of multi-national enterprises (Saka-Helmhout et al, 2016).

3.4 SUMMARY OF KEY FEATURES

The following narratives, summarise the key features of each of organisational learning and institutional conforming, based on the literature reviews in Sections 3.2 and 3.3, respectively.

3.4.1 Summary of the key features of organisational learning

The motivational driver for organisational learning is strategic adaptation and technical efficiency. Potential opportunities to innovate will be sought continually and these will be evaluated in the above terms. Innovations will arise from the juxtaposition of new internal knowledge, new external knowledge and the existing organisational memory consisting of shared cognitive maps and operational routines. New internal knowledge arises from monitoring operational behaviour and performance outcomes against targets. New external knowledge arises from scanning the environment for intelligence, successful behaviours learned vicariously and the requirements of stakeholders. Experimentation can produce new internally or externally sourced knowledge. The assessment of new knowledge together with old knowledge involves a process of sense-making, where the knowledge is interpreted for corporate meaning and cause-effect relationships. Sense-making is a shared process and relies on participation, openness and the search for consensus. This process results in evaluations of behavioural change, such as the adoption and implementation of major new innovations down to minor incremental improvements to operational routines. All intended behavioural changes, both major and minor, and the process of integrating new ideas

into existing operational routines, are evaluated in terms of technical efficiency. These changes are reflected upon for lessons learned.

3.4.2 Summary of the key features of institutional conforming

The motivational driver for change is to achieve legitimacy with stakeholders by conforming to the implementation of norms in respect of organisational forms and working practices. The consequence is that organisations will implement innovations which are standard in terms of overall intent and design. There are three different mechanisms which influence conformance. Coercive pressure is from the government and powerful partners or parent bodies who have control over regulation/ certification and the allocation of funds and other resources. Mimetic pressure is in respect of peer group competitors who are first movers and who are imitated because of their reputation for their business performance or past innovation performance. A special case of imitation is following a bandwagon, which is the adoption of popular management innovations, with more spin than underlying merit, the influence emanating either from peers or from 3rd party consultants. The third pressure is labelled normative and is where an innovation is already a sector norm and has been implemented by a majority of peers, where there is conventional adherence to industry standards, where standards are set by professional bodies and otherwise generally recognised stakeholder expectations. These influences are particularly strong where the efficacy of the innovation is difficult to assess. First movers are a special case and are motivated by technical efficiency rather than legitimacy. It is always open to senior management to resist institutional pressures, with the possible risk of alienating stakeholders.

CHAPTER FOUR

CONTEXTUAL FACTORS

4.1 INTRODUCTION

Research questions in organisational studies sit in a rich organisational and environmental context, a comprehensive understanding of which greatly facilitates the specification of research objectives, the design and conduct of the research itself and the analysis and interpretation of results. The contextual material relating to innovation and collaboration is vast. The author has pruned this material down to the essentials necessary to fulfil two purposes. The first purpose is to select from the range of possible contextual factors, control variables for use in the quantitative research. The second purpose is to select from the range of factors, topics which a researcher should be familiar with when undertaking qualitative research – not to constrain, but to inform discussions that may emerge during the interviews and that may contribute, in one form or another, to resulting analytical themes.

Two sets of factors are presented – organisational and environmental. The organisational factors are: organisation size (4.2); organisation structure (4.3); leadership and innovation support (4.4); and a professional workforce (4.5). The environmental factors are: the rate of technological change (4.6); and market competition (4.7).

Each factor has been chosen because it has a powerful body of theory and empirical evidence demonstrating its potential influence on innovative behaviour in its own right and thus the potential to be a moderating or mediating contingency in the relationship between collaboration, organisational learning or institutional conforming and innovative behaviour.

4.2 ORGANISATION SIZE

The characteristic that has been associated with innovation more than any other in quantitative surveys is organisational size. The advantages of being large are mainly concerned with economies of scale (Damanpour, 2010; Stock et al, 2002). A large organisation can more easily absorb the potentially high fixed costs of innovation (Damanpour, 2010; Perez-Cano et al, 2013), spread the risks of failure (Damanpour, 1992 & 2010; Camison-Zornoza et al, 2004) and afford slack resources for experimentation (Damanpour, 1996). Another advantage is that large organisations can afford more functional and skills differentiation (Moch & Morse, 1977; Stock et al, 2002; Damanpour, 2010) which thereby provides greater access to knowledge concerning new ideas and practices (Moch & Morse, 1977). Further, being a market leader means it is easier to exploit new opportunities and enter new markets. However, there are disadvantages in being large in that higher levels of bureaucracy mean control is more difficult and costly.

A small organisation has the advantage of being more flexible and quicker to respond to opportunities (Damanpour, 1992 & 2010; Stock et al, 2002; Camison-Zornoza et al, 2004) and of having simpler internal communications (Damanpour, 1992). Another advantage is said to be a greater level of morale, motivation and direct links to compensation packages (Stock et al, 2002). On the other hand, there are perhaps greater opportunities for career enhancement in large organisations (Damanpour, 1996).

Two large meta analyses, specifically concerning this topic, have been conducted by Damanpour (1992) and Camison-Zornoza et al (2004). They both concluded that there is a positive association between size and innovation. A more recent study by Perez-Cano et al (2013) confirmed this positive association.

Proposals for this research

There is considerable theoretical and empirical evidence indicating that the larger an organisation's size, the greater would be their level of innovation. It is a frequently used control variable in quantitative studies concerning innovation and is straight forward to operationalise and understand. However, it is of less use in a qualitative

analysis, because the arguments are so diverse that it is difficult to disentangle cause and effect. A statistical analysis bypasses this problem by measuring the outcome on an asymptotic basis. It is proposed that with regard to the quantitative research, organisational size is a control variable. However, with regard to the qualitative research, it is proposed that it is only taken into consideration when selecting organisations in any multiple-organisation case study, but is not considered when determining interview topics.

4.3 ORGANISATION STRUCTURE

4.3.1 Specialisation, centralisation and slack

Many early studies sought to examine the relationship between organisation structure and innovation. Three aspects were studied – the degree of specialisation; the degree of centralization usually coupled with the degree of formalization; and the degree of slack.

The structural dimension most often associated with innovation is specialisation. This is a measure of diversity within an organisation and, since innovation often arises from re-combinations of knowledge (Nahapiet & Ghoshall, 1998), more specialisation potentially leads to greater innovation. It also has the advantage of an increased depth of knowledge base for the development of new ideas (Damanpour, 1992) and for the exploitation of more differentiated solutions (Argote, 2013). Hage (1999) also believed that specialization is linked with innovation through increased boundary spanning and higher absorptive capacity. There have been several studies that have demonstrated an association between specialization and innovation, including those by Aiken & Hage (1971), Kimberley & Evanisko (1981), Ettlie et al (1984), Dewar & Dutton (1986), Damanpour (1987), Subramanian & Nilakanta, (1996) and Hage (1999).

Centralization is the hierarchical location of decision making. It is associated with formalization, which is the level of formality of working practices such as operational procedures and job descriptions. The theory is that decentralization and a lack of formal rules encourages innovation through being more flexible and open (Subramanian & Nilakanta, 1996), having better communications and fewer delays and being less risk adverse (Moon, 1999). All this means an organisation can be more responsive to their

customers (Moon, 1999). An allied concept to centralization and formalization concerns the idea that a higher number of hierarchical layers exacerbates those characteristics by reducing organisational sensitivity and increasing the communications burden (Moon, 1999). There have been fewer studies of centralization than specialization. Subramanian & Nilakanta (1996) and Hage (1999) found a negative association with innovation and Dewar & Dutton (1986) found no clear association either way.

Bourgeois (1981) defined slack as "the cushion of actual or potential resources which allows an organisation to adapt successfully to internal pressures for adjustment or to external pressures for change in policy, as well as to initiate changes in strategy with respect to the external environment" (P30). Slack can involve two forms of resources – financial and people (Nohria & Gulati, 1996). According to Nohria & Gulati (1996), with slack financial resources, an organisation not only has more money to invest in innovation, but can better withstand the failure of some innovations. This makes the organisation less risk averse and more likely to experiment and innovate. According to Nohria & Gulati (1996), slack people resources takes several forms – at the operational level, with slack, practitioners have sufficient time to reflect on, re-invent, be trained in and embed innovations and time to experiment themselves; and managers have more time to sponsor and orchestrate innovations; and specialist champions and project teams can be set up to facilitate development and implementation. Two studies, by Damanpour (1987) and Subramanian & Nilakanta (1996), have found a positive association between slack and innovation. However, the most thorough investigation into the topic was by Nohria & Gulati (1996). They found a U-shaped relationship. A critical mass of slack resources is required to encourage experimentation, but as slack resources increase past a threshold point, diminishing returns set in as all the best opportunities for experimentation have already been utilised.

Proposals for this research

Although there is considerable theoretical and empirical evidence linking specialization with innovation and some theoretical evidence linking slack with innovation, none of these factors are considered suitable. Firstly, structural characteristics tend to be homogenous within a particular sector. Accordingly, they would not be very useful as differentiators between individual organisations in the same sector. Secondly, they are

quite difficult to operationalize and measure as control variables in a quantitative analysis or to assess in an interview. It is therefore proposed that with regard to the quantitative research, organisation structure is not adopted as a control variable, and, similarly, with regard to the qualitative research, organisation structure is not explored in its own right during any interview.

4.3.2 Mechanistic and organic organisational forms

Many writers have attempted to categorize organisations according to their form using a mix of structural and cultural characteristics. Possibly the most well-known organisational form is the bureaucracy, which Weber (1947) regarded as the dominant form of large organisations in the early 20th century. The bureaucratic form is characterized by: many vertical organisational layers; well defined objectives and rules which cascade top down through the layers and which are comprehensive enough to handle any contingency; and a division of labour into tightly defined specialist roles in which there is no room for personal agendas or creativity. The result is tight control, excellent co-ordination and a high level of efficiency – but only if the organisational tasks are simple and the environment is stable. This organisational form is the antithesis of innovativeness (Thompson, 1965).

The seminal writing that suggested the antidote to the bureaucratic form is Burns & Stalker's (1961) book "The Management of Innovation". They developed the concept of organisations having mechanistic or organic systems. These two management systems represent extremes – most organisations have elements of both systems. The mechanistic system has a strong affinity with bureaucratic structures. Burns & Stalkers's (1961) theory is that mechanistic systems are appropriate in stable circumstances and organic systems are appropriate in times of turbulence, when an organisation has to adapt quickly to new situations. In other words, an organic system is much more likely to facilitate innovation than a mechanistic one. Burns & Stalker (1961) describe 12 characteristics for each system. Table 4.1 is a consolidation and simplification of these characteristics.

Table 4.1 Comparison of mechanistic and organic organisational features

Characteristic	Mechanistic	Organic
Structure	Rigid, hierarchical compartments containing specialists	Fluid, networked cells of multi-disciplinary teams
Control	Top down through layers of management Strict targets and rules cascaded down	Arm's length. Vision is set at the top and each level is empowered to exercise judgement and to make decisions at the point of practice in order to respond to internal and external events
Rules and procedures	Rigidly defined for each compartment	Continually refined through interaction
Communications	Vertical, consisting mainly of decisions and instructions	Lateral, to and from any level, consisting of consultation requests/ responses
Commitment	Loyalty and obedience to supervisors	Commitment to an organisation's overall vision and ethos
What knowledge is valued	Internal knowledge of the organisation	Cosmopolitan knowledge

Source= summarised from Burns & Stalker (1961)

In terms of the structural characteristics described earlier, both the mechanistic and organic forms consider specialization, by valuing structural diversity and so this is not a distinguishing feature. However, the mechanistic system is much more centralised and formal than the organic system. On the other hand, the organic form has greater levels of informal communications and fewer rules of engagement and so it is reasonable to extend the characteristics listed above to say that the organic form is people oriented and that it involves relatively more extensive communication, with relatively more tacit knowledge than explicit knowledge. The absence of rules and more arm's length control, suggests that the organic form would entail what we would nowadays call empowerment. There is a paradox of loyalty between the two forms. Under the mechanistic system, there is a strong loyalty to the organisation, controlled through instrumental rewards and punishments. Under the organic system, there is a responsibility for furthering the organisation's aims or vision, although there is an expectation that a member will also have external loyalties to their profession.

The concept of an organic organisational form has been extended subsequently by several other writers. Mintzberg (1983), in his work on organisational design, describes a machine bureaucracy (equivalent to the mechanistic form) and an adhocracy (similar to the organic form). Other important writers are Miles and Snow (1986). Their name for an organic form is the network organisation. They see this form as particularly relevant to circumstances in which the rise of globalization and rapid technological change have created a permanent state of environmental turbulence.

Organisations do attempt to change their archetypal form, but so embedded and pervasive are the characteristics, that changing say from a mechanistic to an organic form, or even just to improve absorptive capacity, is often very difficult. An example is provided by Pettigrew (1987) who describes Harvey-Jones time at ICI where it took him years of gradually nudging the organisation's structure, culture and political processes before they became more conducive to taking opportunities for innovation. Another example is provided by Bate (2000) who describes an NHS hospital's two-year struggle to turn itself from a rigid hierarchical form to a flexible networked form. Not only were structural changes required but also new ways of professionals working together – from tribalism to collaboration, from individual accountability to collective responsibility and reflection and from an internal to a customer focussed orientation. During the transition period, many top people left, and some new structures and procedures needed several iterations before they worked.

Proposals for this research

Fluid structures, arm's length control through a shared vision, empowerment and an emphasis on lateral communication, make the organic form highly suited to innovation. Although the original concept is now rather old, as an indication of the organisational form most suited for innovation it has stood the test of time and is still widely quoted – according to Google Scholar, the original book has been cited over 13,000 times. Fairly recently, in 2012, Souitaris & Zerbinati, used the concept explicitly as a mediating variable in a study of innovation. With regard to the quantitative research, it is proposed that it is used as a control variable. With regard to the qualitative research, it is not proposed that it is used as an interview question but that it is borne in mind and probed further should it arise.

4.4 LEADERSHIP AND INNOVATION SUPPORT

These two topics are being dealt with together as there is considerable overlap in their component concepts and, indeed, in one branch of management, in the study of innovation in teams, they are usually co-joined. There is extensive theoretical and empirical material linking each of leadership and innovation support (the latter being synonymous with "the learning organisation") with innovative behaviour.

4.4.1 Leadership

Clegg et al (2008) defines leadership as "the process of directing, controlling, motivating, and inspiring staff towards the realisation of stated organisational goals" (p.130). Early leadership research attempted to relate leadership traits, such as educational level, with innovation (Baldridge & Burnham, 1975; Kimberley & Evanisko, 1981). Findings were often inconsistent. Later studies began to consider leadership behaviours, distinguishing between a focus on tasks – often called directional leadership; and a focus on people – often called participative leadership. An early example of this approach is Blake and Mouton's (1964) "Managerial Grid", which paved the way for the theory of transformational and transactional leadership.

The distinction between transformational and transactional leadership styles originated with writings by Burns (1978), but it was Bass (1990) who linked the concept with innovation. According to Shamir et al (1993), transformational leaders instil a collective commitment to a collective vision. They are able to do this because they instil a collective identity, which is encapsulated in the vision, and they value the efforts of people who are convinced that such collective efforts will prove efficacious.

Later, Bass & Avolio (1999) developed a Multifactor Leadership Questionnaire (MLQ), which has been widely used in industry. The MLQ instrument has six main

behavioural variables, as depicted in the following box.

The characteristics of transformational and transactional leaders

A **transformational leader** is associated with four behavioural variables: **Inspirational leadership** – Providing meaning and challenge by articulating an appealing vision. **Intellectually stimulating** – Providing the circumstances for being creative and innovative. **Idealised influence** – by being a charismatic role model. **Individualised consideration** – coaching/ mentoring on a one-to-one basis. (One would expect that this characteristic is more relevant to innovation in teams than to strategic innovation in large organisations.)
A **transactional leader** is associated with two behavioural variables: **Providing instrumental rewards and punishments** for good/ bad achievement of set targets **Passive leadership** - managing by exception, ie when things go wrong.

Source= based on Bass & Avolio (1999)

In a similar vein, Boje & Dennehy (1993) differentiated between modern and postmodern leadership styles. In a modern leadership style, a leader is at the top of a vertical, authoritarian and compartmentalised hierarchical structure who carries out an inspector function with instrumental rewards and punishments. In a postmodern leadership style, a leader acts as a servant, who creates visions, empowers and facilitates people to implement this vision – he or she is a team builder, coach and networker. One can see a strong resemblance between modern, directional and transactional leadership styles on the one hand and between postmodern, participative and transformational leadership styles on the other hand. Further, one can see a strong family resemblance between the two styles and Burns & Stalker's (1961) mechanistic and organic organisational forms, respectively. Accordingly, one might expect that transformational leadership is more associated with innovation and transactional

leadership is more associated with performance. And indeed this has been found to be so in empirical studies.

Four empirical studies have explored the relationship between transformational leadership and innovation and or performance. A summary of their findings is set out in Table 4.2. All four studies show a significant positive correlation between transformational leadership and either innovation (three studies) or business performance (one study). The situation with regard to transactional leadership is inconclusive. Firstly, it was only tested in two of the studies and secondly, a significant correlation with innovation was found in only one of those studies but not in the other. Taking a slightly different perspective, Somech (2006) found that transformational leadership is more suitable for innovation and transactional leadership is more suitable for business performance.

Table 4.2 Results of empirical research into transformational and transactional leadership

		Behavioural variables					
		Transformational Leadership				Transactional Leadership	
Study	Dependent variable	Inspirational	Intellectually stimulating	Charismatic	Coach	Instrumental rewards	Manages by exception
Howell & Avolio (1993)	Business performance	Not tested	✓	✓	✓	×	×
Jung et al (2003)	Innovation	✓	✓	✓	✓	Not tested	Not tested
Elenkov et al (2005)	Innovation	✓	✓	✓	✓	✓	✓
Moolenaar et al (2010)	Innovation	✓	✓	Not tested	✓	Not tested	Not tested

✓ = significant positive association found
× = significant positive association not found
Source=author

Two recent studies have confirmed a strong positive association between transformational leadership and innovation: Chen et al (2016), especially in the presence of social capital; and Raj & Srivasta (2016), especially in the presence of organisational learning.

Three other perspectives of leadership in an innovation context are worth noting. The first perspective is where Van de Ven et al (2008) identified five different leadership

roles associated with innovation, each typically being undertaken by a different person. The institutional leader sets up an innovation project; the sponsor provides resources and acts as a champion; the mentor coaches and provides advice; the critic(s) challenge goals and progress; and the entrepreneur manages the venture. The second perspective concerns Daft's (1978) dual core model of organisational innovation, where ideas for administrative innovation start with top management and trickle down and ideas for technological innovation start at the bottom and trickle up. Daft said that this is because ideas originate in areas where the creator has expertise. The third perspective concerns the role of a champion, who provide unofficial leadership in promoting a specific innovative change (Howell & Higgins, 1990; Howell, 2005).

Proposals for this research

In view of the importance of transformational leadership to innovation and that it is a fairly simple construct to measure, it would be desirable to include some form of the construct as a control variable in the quantitative research. With regard to the qualitative research, the topic of transformational leadership is not a prime focus for this research and should not be a prime interview question. However, it should be borne in mind and probed if it emerges in the interviews.

4.4.2 Innovation support

Innovation support is a facet of an organisation's culture. Organisation culture emphasises a people perspective as distinct from structure which emphasises a systems perspective (Smircich, 1983). According to Schein (1984), culture is manifest at three levels – physical artifacts, eg product designs; explicit policies, such as mission statements and reward systems; and, underlying values, such as attitudes to diversity/ conformity and being autocratic versus being collegiate. A post-modern perspective of culture is the role of historical narratives of exemplar innovations which accumulate to form an organisational memory, and which encourage managers and employees to interpret and make the most of current situations (Bartel,2009).

Writers have identified the cultural factors/ behaviours that are conducive to innovation. Two notable schools of thought that have contributed much to this topic are the learning organisation and team leadership. For the purpose of this thesis, the

work of 14 notable authors in these fields were analysed. Some 25 factors were identified, and these were rationalised and categorised into six themes, as set out in Table 4.3. These six themes distil the essence of innovation support. The first theme is "strategic direction". This includes having a clear and shared vision, which is one of the key traits of a transformational leader and a key feature of the organic form. It also includes evidence that the senior management is committed to the vision, for example by providing adequate resources to carry out the vision. The themes "openness to learning" to new ideas, wherever in the organisation they come from and "team development", also echo transformational leadership, where the leader is a coach rather than an autocrat, and also echoes empowerment in the organic form. The themes "knowledge sharing" and "team dynamics" are similar to the emphasis on communications, especially lateral communications, in the organic form. The presence or absence of these six themed behaviours in any setting should be a good indication of how conducive the organisational environment is for managers and staff to be innovative themselves and for them to support other work colleagues in being innovative and to support the organisation's strategic innovation initiatives.

Table 4.3 List of organisational behaviours that provide innovation support Source=author

Author ➔ Topic ➔	Scott & Bruce (1994)	West & Anderson (1996)	Goh & Richards (1997)	Anderson & West (1998)	Hoegl & Gemuenden (2001)	Calantone et al (2002)	Martins & Terblanche (2003)	West et al (2003)	Pearce & Ensley (2004)	Amabile et al (2004)	Rushmer et al (2004a,b,c)	Montes et al (2005)	Edmondson (2008)	Smith (2011)
Strategic direction														
Clear and shared vision			✓	✓		✓	✓				✓		✓	✓
Agreed plan of action			✓						✓	✓				
Leadership commitment			✓											✓
Concern for excellence				✓					✓					
Adequate resources		✓					✓							
Openness to learning														
Commitment to learning						✓								
Experimentation			✓											
Openness			✓			✓	✓				✓	✓	✓	
Open to new ideas													✓	
Challenge assumptions											✓			
Differences of opinion welcomed	✓			✓								✓	✓	
Tolerance of failure											✓		✓	
Knowledge sharing														
Sharing knowledge and best practice			✓			✓								
Practices learned from other organisations			✓								✓			
Team dynamics														
Frequent communications				✓	✓			✓						
Team problem solving			✓				✓				✓		✓	
Good team spirit					✓									
Conflict handling							✓							
Team development														
Empowerment			✓				✓							
Consultation in key decisions			✓							✓				
Coaching and feedback	✓	✓	✓						✓	✓	✓	✓		
Ensure contribution from everyone					✓									
Time for reflection			✓										✓	
Recognition														
Recognition for good ideas			✓				✓			✓				✓
Celebrate success											✓			

Proposals for this research

With regard to the quantitative research, the concept of innovation support is too complex to include as a control variable. However, as the ideas encapsulated in innovation support, transformational leadership and organic form overlap to a considerable extent, it may be useful, subject to conceptual legitimacy, to devise a composite construct – which has the overarching theme of how an organisation should organise itself to optimise innovativeness. With regard, to the qualitative research, innovation support should be borne in mind, but due to its extensive subject matter, it cannot be allowed to monopolise interviews at the expense of the prime research questions.

4.5 A PROFESSIONAL WORKFORCE

The question is whether a predominantly professional workforce, as in tertiary education organisations, has implications for collaboration and/or for innovation.

Early writers who mentioned professionals in a collaboration context were not very complimentary. Mintzberg (1983) characterised the professions by their insularity. Senge (1990) considered professionals to be poor team players. The worst criticism was made by Argyris & Schon (1978) who argued that professionals are socialised by their education to be impersonal, in control and to win at all costs – an orientation that impedes collaboration. In the educational world, according to Weick (1976), academics rarely needed to interact as part of their normal work, only in response to ad hoc events. Adler (2008) has argued that there has been a significant change in recent years in the authority and organisation of professionals. Market and government pressures have not only led to the introduction of managerialism but also reduced the occupational monopoly over the domain of practice that professionals once enjoyed. In addition, the growing complexity of operational tasks has meant the growing importance of multi-disciplinary teams. There has been a consequential change from individual autonomy to collective collaboration, particularly in medicine, but also in the other professions.

Professionals often need to collaborate, but this is made difficult because of their identity with different professional sub-cultures. Members of any professional sub-culture share a common mind set which includes shared patterns of values, beliefs, meanings and expectations (Siehl & Martin, 1984; Van Maanen & Schein, 1979; Morgan & Ogbonna, 2008; Mudambi & Swift, 2009) and will also share differing network structures (West, 1999). These factors create cognitive and social boundaries between and within different professions. The situation is exacerbated by the professions often having erroneous assumptions about each other's mind sets (Purcell & Leppien, 1998). Furthermore, the different professions often have different status and power (Sheppard, 2002; Fitzgerald et al, 2003). The net result of all of these problems is that there is tension due to arguments over roles and processes, leading to inefficiency and ineffectiveness Amabile et al (2001, and knowledge is sticky to transfer, and innovation is slower than otherwise it might be (Fitzgerald et al, 2003).

Turning specifically to professionals and innovation, Drazin (1990) focuses on the potential for conflict. He maintains that the homogeneity of professional groups is only partial and that, often they are internally differentiated with diverse activities and norms. He cites academics as an example, who are split by schools of thought; by whether their career concentrates on teaching, research, consultancy or publishing; by the type of research methodology they espouse and so on. According to Drazin, these distinctions have a profound effect on academics' work activities, employment opportunities, status and income. He believes that the underlying motivation of academics is power, status and control over knowledge and that this causes both intra-professional and inter-professional rivalry and conflict. Further, he believes that this is especially pronounced if an innovation causes the relative advantage between groups to be disturbed. Drazin's overall view of professionals and innovation is summarised thus "Innovation, then, can be seen as a political act, taking place within a network of partisan interests and worked by professionals to advance, maintain or defend their claims to legitimate control over a professional domain" (P252). This corroborates the conclusions of Heydebrand (1973) who distinguished between two types of innovation: in one type, innovations extend the domain of professionals and thereby extend the power of professionals – these innovations are therefore generally supported by professionals; and in the other type, knowledge and practice are standardised and

rationalised, such that the work can be done by less skilled "para-professionals" – leading to a loss of power and prestige and competence destruction.

Proposals for this research

There is rather mixed theory and empirical evidence concerning whether professionals are more or less associated with collaboration and / or with innovation. There is strong evidence that there may be difficulties with different professional sub-cultures communicating with and understanding each other, but this is more relevant in healthcare settings. There is some evidence that professionals may be resistant to change because of a desire to protect their status and privileges. It would be useful to include a simple measure of resistance to change in the quantitative research. It should not be a focus for the qualitative interview although it should be borne in mind.

4.6 THE RATE OF TECHNOLOGICAL CHANGE

New technological paradigms result from the juxtaposition of scientific breakthroughs with favourable economic and institutional conditions Dosi (1982). According to Romer (1990), these technological paradigms drive the innovative design of new products and processes. Innovation is heightened if there is greater technological turbulence and a greater variety of technological options (Caruana et al, 2002). A recent example, according to Schilling (2015), was the technological shock in the 1990's with the rise in semi-conductor productivity and the growth of Internet hosts. This led to a huge growth in innovation and alliances.

Proposals for this research

Although these theories seem particularly aimed at high technology industries, they may be relevant to the TES as there is beginning to be a significant increase in the use of technology in such areas as technology enhanced learning, distance learning and MOOCS. The question is whether this increase in technology may be an incentive for TES senior management to increase their rate of innovation. This is an issue that is not covered in the learned journals. Whether to include this item in the research was the subject of a preliminary research exercise, described in Section 7.4.3.5.

4.7 MARKET COMPETITION

According to Schumpeter (1934), the absence of competition promotes investment in innovation by allowing a firm to appropriate larger profits. However, in traditional industrial economics theory, the existence of competitive market structures, such as a large number of buyers and sellers, the availability of substitutes and low barriers to entry, increases the pressure on firms to innovate in order to lower prices or to differentiate the quality of their products/ services (Mason, 1939; Scherer, 1996; Porter, 1980). There are alternative arguments based on management theory, that monopolies have an advantage because they can afford more R&D professionals and can commit to long term or risky projects (Damanpour, 2010).

In terms of empirical evidence, out of 10 studies found for this thesis, seven demonstrate a positive association between competition and innovation (Kimberley & Evenisko, 1981; Baily et al 1995; Blundell et al, 1995; Nickell et al, 1997; Vives, 2008; Ang, 2008; Alexiev et al, 2016), one demonstrates a negative association (Lubienski, 2003), one demonstrates a complex conditional association (Tang, 2006) and one demonstrates an inverted U-curve association (Hashmi, 2013).

Proposals for this research

There is certainly theoretical and empirical evidence that competition may affect innovation. Whether it is relevant in a TES context is not a question answered by learned journals. Again, whether to include this item in the research was the subject of a preliminary research exercise, described in Section 7.4.3.5.

4.8 SUMMARY OF CONTEXTUAL FACTORS

This chapter proposes the following use of the selected innovation factors in this research:

Table 4.4 Proposed use of innovation factors in this research

Innovation Factor	Use in quantitative research	Use in qualitative research
Organisation size	Control variable	Consider when selecting participating institutions
Specialisation, centralisation and slack	Not used	Not used
Organic organisational form	Control variable	Borne in mind
Leadership	Control variable	Borne in mind
Innovation support	Possibly integrate with organic form and leadership	Borne in mind
Professional workforce	Control variable	Borne in mind
Rate of technological change	See Section 7.4.3.5	Borne in mind
Market competition	See Section 7.4.3.5	Borne in mind

Source = Author

CHAPTER FIVE

RESEARCH SPECIFICATION

The purpose of this chapter is to summarise the development of and clarify the interpretation of the research questions and research objectives and to present research models for the quantitative and qualitative research, respectively.

5.1 SPECIFICATION OF RESEARCH QUESTIONS AND RESEARCH OBJECTIVES

The Introduction chapter sets out the two research questions:

RQ1: How and why does collaboration influence strategic organisational innovation?

RQ2: Which of organisational learning and institutional conforming influence strategic organisational innovation more, and why?

The ten research objectives are set out in Table 5.1, overleaf, with each being annotated with its specific source and focus. Four research objectives are developed in Chapter Two and relate to RQ1 and three research objectives are developed in Chapter Three and relate to RQ2. Three research objectives are not directly derived from the literature review and are developed below.

RO1 is an additional preparatory question, which explores the nature of strategic innovative behaviour and is a necessary first step to approaching ROs 2 through 5. This is interesting information in its own right and can be used to develop interesting analyses.

With regard to RO9, the literature review identifies several independent variables - not only collaborative behaviour, but also organisational learning, institutional conforming and the organisational/ environmental factors. Path model analysis and multivariate analysis are powerful statistical modelling tools for assessing the contributions and relative importance made by such independent variables in their respective impact on the dependent variable. This is the purpose of RO9.

RO10 is also a positioning research objective. Collaboration implies a direct relationship with one or more external players, where the collaboration results in the development of innovation concepts. However, structurally, there are other sources of innovation concepts. For example, Mintzberg (1976) identified two basic choices – internal and external sources. So, an alternative source of innovation concepts is ideas generated internally by an organisation's own employees. Furthermore, external sources may involve direct collaboration, but may also be the result of an organisation becoming aware of innovation concepts that have been generated by non-collaborative third parties or have become well known industry solutions. In order to establish the relative importance of collaboration-oriented innovation, it is useful to position such innovation vis-à-vis innovation emanating purely in-house and innovation imitated, without collaboration, from external sources. This is the purpose of RO10.

Table 5.1 Source and focus of each research objective (Source=author)

RO No	Research Objective	Source	Research Approach QT v QL	Focus on RQ1:C⇨I or RQ2:OLvIC	Focus on CT	Qualify by U v FE	Qualify by Inn Type	Qualify by O/E controls
1	What is the nature of strategic innovative behaviour?	Ch 5.1	QT+QL			✓	✓	
2	Does collaborative behaviour influence strategic innovative behaviour?	Ch 2	QT	C⇨I		✓	✓	✓
3	Does collaborator type differentially influence strategic innovative behaviour?	Ch 2	QT	C⇨I	✓	✓		
4	How and why does collaborative behaviour influence decision making in the pursuit of strategic innovative behaviour during the innovation journey?	Ch 2	QL	C⇨I	✓	✓	✓	
5	How and why does each collaborator type influence decision making in the pursuit of strategic innovative behaviour during the innovation journey?	Ch 2	QL	C⇨I		✓	✓	
6	Does organisational learning or institutional conforming influence strategic innovative behaviour more?	Ch 3	QT	OLvIC		✓	✓	✓
7	Does organisational learning or institutional conforming influence collaborative behaviour more?	Ch 3	QT	OLvIC		✓		
8	Which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why?	Ch 3	QL	OLvIC		✓	✓	
9	Using the results from ROs 2 and 6, develop a statistical model that identifies the relative contribution made by the key independent variables in influencing strategic innovative behaviour.	Ch 5.1	QT	C⇨I		✓		
10	Where is external collaboration positioned in the development of concepts for innovation, compared with mainly internally generated sources and mainly externally generated sources?	Ch 5.1	QT+QL			✓		

QT (quantitative); QL (qualitative); C⇨I (collaboration influence on innovation); OLvIC (organisational learning versus institutional conforming influence); CT (collaborator type); U/FE (university/ FE college); Inn Type (innovation type); O/E (organisational and environmental controls)

Clarification of the wording of the research objectives

The wording for some of the research objectives is capable of being interpreted in different ways. This sub-section clarifies the meaning of specific words and phrases.

Table 5.2 Clarification of research objective expressions

Expression	Interpretation
Nature of strategic innovative behaviour	Nature is interpreted in two dimensions: 1) perceived importance and success of strategic innovative behaviour in an institution and 2) the types of innovation perceived as important.
strategic innovative behaviour	This is defined in Section 2.2 and, in respect of the survey, is operationalised in Section 7.4.3.2.
collaborative behaviour	This is direct mutual and purposive interaction between two or more organisational entities. It is discussed at length in Section 2.4 and, in respect of the survey, is operationalised in Section 7.4.3.3.
collaborator type	This is discussed in Section 2.4 and Section 7.4.3.3.
decision making	The expression decision making is used to qualify behaviour during the innovation journey in order to emphasise that the focus of the research is on why things happen as much as how they happen.
innovation journey	A framework for the stages of organisational innovation is presented in Section 2.3.
organisational learning	This is discussed and distilled in Section 3.2 and summarised in Section 3.4.
institutional conforming	This is discussed and distilled in Section 3.3 and summarised in Section 3.4.

Source=author

5.2 SPECIFICATION OF RESEARCH MODELS

Sections 2.5 and 3.1 of the literature review propose that the research should include both qualitative and quantitative analyses. Sections 7.3 and 7.4 explain why a survey has been chosen for the quantitative analysis and Sections 7.3 and 7.5 explain why an interview-based case study has been chosen for the qualitative analysis. In this sub-section, the survey research model, Figure 5.1, and the case study research model, Figure 5.2, are presented and explained. Table 5.3 shows where the components of the two models are developed in this thesis.

Table 5.3 Thesis sections relating to each component of the Survey and Case Study Models

Survey Model Component	Survey Concept Development (Section)	Survey Concept Operationalisation (Section)	Case Study Model Component	Case Study Concept Development (Section)
No equivalent			Innovation Journey	2.3
Strategic Innovative Behaviour	2.2	7.4.3.2	Organisational Innovations	2.2
Collaborative Behaviour	2.4	7.4.3.3	Collaborative Behaviour Framework	2.4
Decision Making Style	3	7.4.3.4	Organisational Learning versus Institutional Conforming	3
Control Variables	4	7.4.3.5	Organisational Framework	4

5.2.1 Survey Research Model

Please refer to Figure 5.1 at the end of this section. This model covers Research Objectives 2,3,6,7, 9 and 10. The prime relationship that is explored is collaborative behaviour as the independent variable and strategic innovative behaviour as the dependent variable. Strategic innovative behaviour is a composite variable consisting of clusters of generic innovation types. (A data model for strategic innovative behaviour is presented as Figure 7.3 in Section 7.4.3.2.) Collaborative behaviour is a complex composite variable consisting of two dimensions – several collaborator types and their associated collaborative processes. (A data model for collaborative behaviour is presented as Figure 7.4 in Section 7.4.3.3.) Organisational learning and institutional conforming are treated as competing independent variables in their own right and as mediating variables for the collaborative behaviour ⇨strategic innovative behaviour relationship. The organisational and environmental control variables are used to test whether they moderate the collaborative behaviour ⇨strategic innovative behaviour relationship. University and FE college findings are compared.

5.2.2 Case Study Research Model

5.2.2.1 Overview

Research Objectives 1,4,5,8 and 10 are explored using a series of organisational innovations (nominated by interviewees). RO4 and RO5 both concern the relationship between collaborative behaviour and strategic innovative behaviour and are explored in tandem. The case study model depicts two dimensions for the collaborative framework – collaborator types and collaborative processes. The details shown in this framework are derived from the literature review. It is an illustrative framework that is borne in mind during the research process. However, actual in-field collaborator types and collaborator processes are allowed to emerge during the interviews and data analysis. Similarly, the organisational framework is derived from the literature review and is illustrative, with the actual in-field organisational framework emerging during the interviews and data analysis. RO4 and RO5 are explored and analysed using a three-stage innovation journey model. This enables a more structured and systematic approach.

RO8 focuses on which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why. In order to answer this question, it is necessary to have a comparative understanding of what organisational learning and institutional conforming characteristics might look like at each stage of the innovation journey. To develop this guideline, the key features of organisational learning and institutional conforming specified in Sections 3.2, 3.3 and 3.4 of the literature review have been matched against the innovation journey framework that was developed in Section 2.3. The actual behaviour of the institutions selected for the case study are then matched against this guideline to identify whether they represent organisational learning or institutional conforming tendencies.

5.2.2.2 Guideline for distinguishing OL v IC behaviours

The guideline for distinguishing organisational learning from institutional behaviour consists of two criteria:

i) how is the innovation justified; and

ii) what is the behaviour during the innovation journey?

The driver for organisational learning is for an organisation to adapt to its environment and to improve its technical efficiency (Fiol & Lyles, 1985; Dodgson, 1993). Innovation opportunities are evaluated and justified in these terms. Technical efficiency is measured by cost-benefit analysis (Boardman et al, 2011; NICHSR, 2016). Evidence for these criteria would be the existence of a business case, which APM (2017) define as: "A business case is the justification for undertaking a project or programme. It evaluates the benefit, cost and risk of alternative options and provides a rationale for the preferred solution." (web page is identified in References). The driver for institutional conforming is for an organisation to improve its legitimacy with stakeholders (Scott, 1983). Innovation opportunities are evaluated and justified in these terms. Evidence for these criteria would include responding to: coercive government regulations (DiMaggio & Powell, 1983; Suchman, 1995; Scott, 2014)); mimetic pressures to follow leading or close competitors (DiMaggio & Powell, 1983; Haunschild & Miner, 1997); and normative pressures to follow the majority decisions/ standards of peers (Haunschild & Miner, 1997; or sector/ societal norms (Suchman, 1995; Scott, 2014).

Turning to the question of behaviour, organisational learning theory is very rich in its exploration of organisational process whereas institutional theory (the theory on which institutional conforming is based) is rather weak. This is not surprising as organisational learning is fundamentally about how to arrive at solutions tailored to the specific needs of a specific organisation (Crossan, 1999), whereas institutional conforming is fundamentally about implementing solutions which are sector standards in intent and design (Westphal et al,1997). Organisational learning behaviour is essentially a proactive approach and institutional conforming behaviour is essentially a reactive approach. Thus, with institutional conforming there are relatively few

recognisable behaviours, except for the absence of recognisable organisational learning behaviours.

From Chapter 3, one can identify three distinguishing behavioural characteristics of organisational learning. These are:

i) scanning externally for ideas and opportunities (Huber, 1991);

ii) a continual monitoring – reflection – adjustment feedback cycle (March & Olsen, 1975; Argyris & Schon, 1978);

iii) sensemaking through open and transparent internal participation (Daft & Weick, 1984; Edmondson, 1999).

Table 5.4 provides examples of these characteristics during each stage of the innovation journey.

Table 5.4 Examples of organisational learning during the innovation journey

Stage ➔ Characteristic ↓	Initiation	Development	Exploitation
Scanning externally	Scanning environment for new innovation opportunities	Vicarious learning how best to implement an innovation	Benchmarking actual benefits
Feedback cycle	Performance monitoring triggers action	Re-engineering innovation and/or re-fitting organisation	Post-implementation review and continuous improvement
Open and transparent sensemaking	Collective sensemaking of new ideas	Shared design of new routines	Speaking up about what works and what does not

Source = Author

A notable feature of the feedback cycle is the use of experimentation (Huber, 1991). For example, this could include experiments to assess efficacy during the initiation stage; trials to assess implementation options during the development stage; and pilots in different business units during the exploitation stage.

Expanding on what was said earlier regarding the absence of institutional conforming processes, in this regard, one can make some logical assumptions. It is part of basic

institutional theory that at some time during the life cycle of an innovation, alternative designs will coalesce into an industry standard solution and that maximum legitimacy will be gained by implementing this standard design (DiMaggio & Powell, 1983). Therefore, there should not be a need to continually scan the environment for best fit solutions or to conduct rigorous evaluation exercises. If one makes the further assumption that the organisation has conformed to standard industry solutions in the past, then the implementation of yet another standard solution should mean a standard off-the-shelf implementation, with little or no need for special tailoring of the innovation or the organisation itself. Furthermore, there will be little or no need for experiments and trials, since there will be accurate vicarious learning data available and little or no need for reflection, except at sector level. Finally, as the adoption decision is a formality and there is little unique tailoring of the innovation or the organisation, there will be little need for internal consultation. Of course, this represents an extreme case, but it does illuminate the kinds of differences one should look for in distinguishing between organisational learning and institutional conforming.

The case study research also compares results according to innovation type and according to the type of institution, ie universities versus FE colleges. Although two specific types of innovation are specified in the design process – employer engagement and technology enhanced learning (based on findings from the survey), considerable time is set aside in the interviews for other innovation types to emerge.

Figure 5.1 (Source = Author)

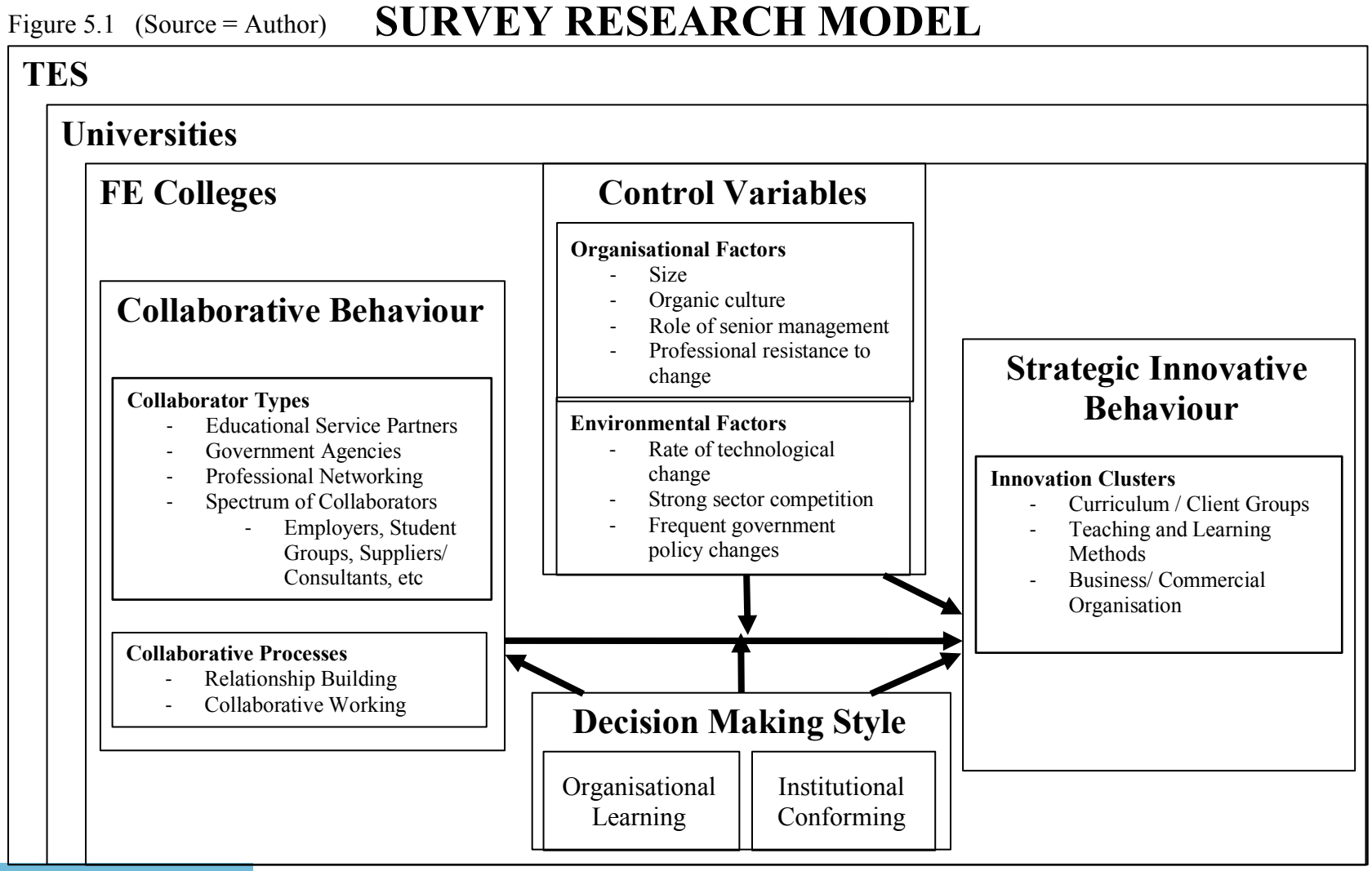
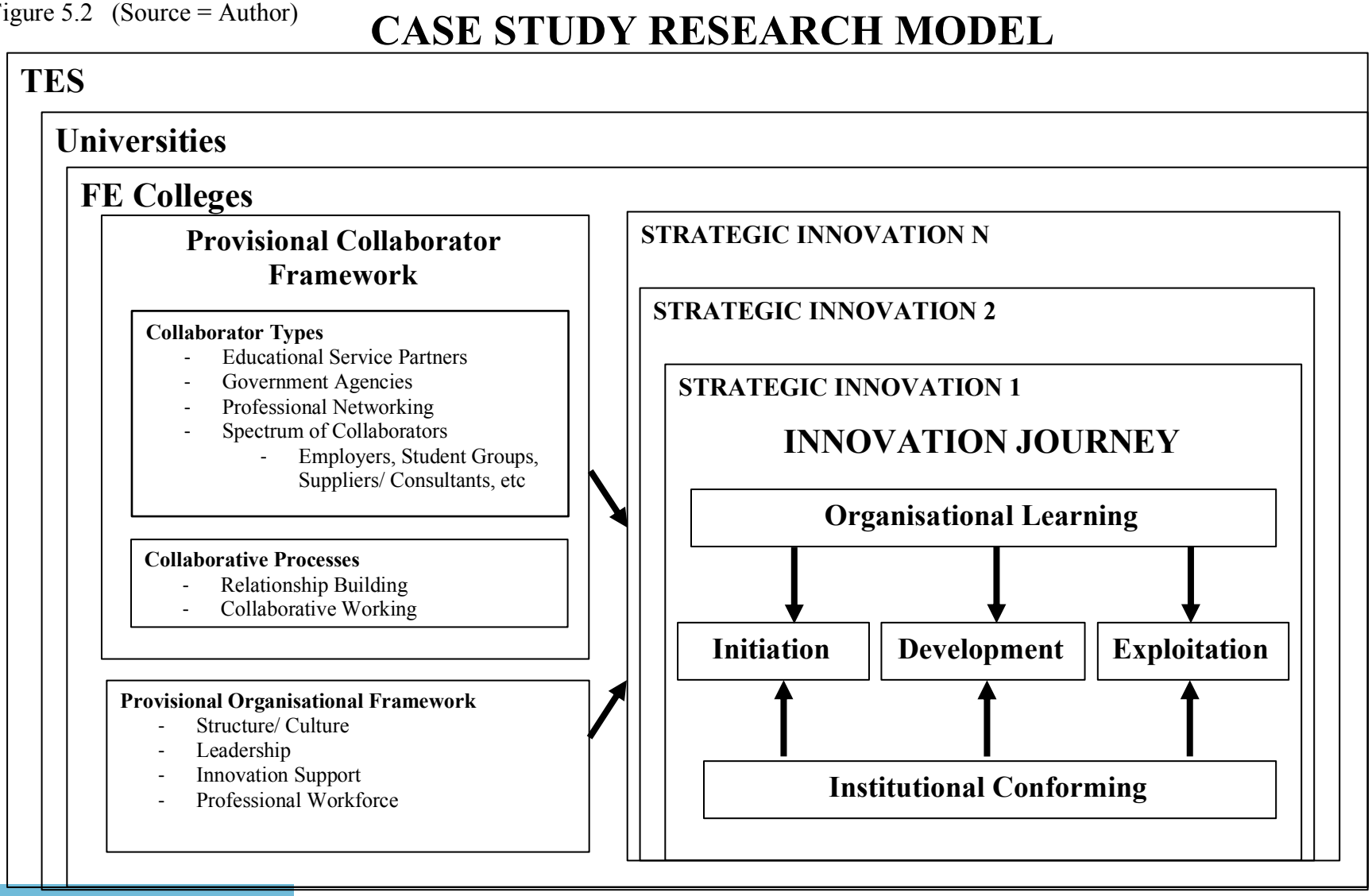


Figure 5.2 (Source = Author)



5.3 Chapter Summary

The research objectives are consolidated from proposals in Chapters 2 and 3 and three further research objectives have been added. The characteristics and interpretation of each research objective are presented in Tables 5.1 and 5.2, with associated text, respectively.

The quantitative survey research model is presented as Figure 5.1, with accompanying text in 5.2.1, and the qualitative case study model is presented as Figure 5.2, with accompanying text in 5.2.2.

A guideline is presented in Section 5.2.2 which specifies how to distinguish organisational learning from institutional conforming in organisations in the field.

CHAPTER SIX

TERTIARY EDUCATION SECTOR BACKGROUND

6.1 INTRODUCTION

This chapter provides background information which may assist a reader's contextual understanding of the tertiary education sector (TES). Innovation in the public sector is markedly different in terms of purpose, structure and approaches than innovation in the private sector. This topic is explored in the first section. Turning specifically to the TES, the second section discusses key recent issues which have a bearing on innovation. The most prominent piece of research in this sector in the UK is that by Hannan & Silver (2000) and this is the subject matter of the third section. Additionally, a comparative summary of key facts and figures concerning universities and FE colleges is included as Appendix A.

6.2 PUBLIC SECTOR INNOVATION AND PRIVATE SECTOR INNOVATION

6.2.1 Recent waves of public sector innovation

Hartley (2005) describes three waves of UK public sector innovation in the second half of the 20th century, as summarised in the next three paragraphs.

The traditional public administration approach applied up to the 1980's. It was based on the bureaucratic, top down implementation of ministerial policies enacted by legislation. The population was assumed to be homogenous and therefore a standardised service was adequate. This was specified by professional civil servants.

Innovations were typically large scale, universal in coverage and quickly and objectively visible to a wide range of stakeholders.

New Public Management became an important philosophy in the 1980's, partly as a response to the perceived need to curb the growing proportion of GDP spent on public services and partly as a response to the growing demand by the public that they should be treated more like customers and have more choices. Many public sector departments were affected – and, where feasible, discrete core operations were given semi-autonomous agency status and many internal service departments were subjected to market testing. More autonomy was given to local hospitals and colleges – for example, the umbilical cord whereby further education colleges were controlled by local authorities was severed in 1992.

Hartley (2005) then describes the third wave as networked governance. Here the state's role is to steer action within a complex social system rather than through hierarchical or market mechanisms. Policy makers provide resources for experiments in collaboration – such as pilots and beacons – and orchestrate the interests of different stakeholders.

Extrapolating on from where Hartley leaves off, in the UK we have had the Blair/ Brown administrations and the Cameron/ May administrations. The key features of the Blair/ Brown administrations were the large expansion in funding for public services, particularly health and education; the central setting of quite detailed targets which managers of local public services were made accountable for; and a continued push for joined up Government. The key features of the Cameron/May administrations have been a reduction in funding for public services, although large parts have been ring-fenced; and, in theory, the removal of central targeting in favour of the devolution of responsibility to local front-line providers and their clients.

Hartley et al (2013) has suggested that new public management has introduced barriers to innovation, such as the imposition of proxy targets and the dissemination of "best practice" instead of searching for "next practice". They argue for a more collaborative approach – strengthening transformational leadership capabilities and the co-ordination

between public agencies with consequential improvements at all stages of innovation. They quote empirical evidence for the effectiveness of this approach (Eggers & Singh, 2009; Bommert, 2010; Sorensen & Torfing, 2011).

On the downside, certain public sector partnerships, which have been encouraged to form in order to solve so called "wicked" government problems, have been difficult to get right, often due to conflicting agendas and unclear responsibilities (Ferlie & Pettigrew, 1996; Milward & Provan 2006; Lowndes & Skelcher, 1988) and a lack of governance models and social capital capabilities (Wilkins et al, 2015).

6.2.2 The objectives of public sector innovation

There are two sources of material which provide a good picture of the broad objectives and triggers for public sector innovation. The first source is from the USA, where, since the 1980's, the Ford Foundation has sponsored Harvard's Kennedy School of Government (HKSG) in making annual awards to public service organisations making the best innovations. The second source is the international study, PUBLIN, funded by the European Commission, which published a series of reports in 2005, in particular, a report on the differences between public and private sector innovation (Halvorsen et al, 2005).

Borins (2000a, 2000b and 2006) has analysed the HKSG innovations and found the common broad purpose to be the implementation of better services in local public service organisations. He identified several thematic strategies for change, including: the pursuit of a holistic/ joined up approach to service provision; improving delivery processes; the introduction of new technology; and the involvement of the private sector as a catalyst. Borins (2000a) found that the measure of success for 90% of the innovations was improved services rather than reduced costs. This accords with the findings of McDonald & Srinivasan (2004) and corroborates Feller's (1980) theory that civil servants prefer to improve services rather than reduce costs because this maintains their budgets and therefore their status, power and earnings. Borins's (2000a) statistics also reveal that 90% of innovations had been investigated or copied by another local public service. In terms of process, studies by Behn(1988) and Golden (1990) suggest

that public sector innovation is characterised by a "groping along" approach, as opposed to a "planning" approach. However, Borins (2000a) found that the ratio for innovation projects was 2:1 in favour of a planned approach.

Turning to PUBLIN, Halvorsen et al (2005), found that the common purpose of public sector innovation is to respond to shortfalls in service or changing needs and to increase efficiency and/or reduce the cost of delivering services. According to Halvorsen et al (2005), the usual triggers for change are environmental factors, such as demographic changes, economic downturns, technological developments and natural catastrophes; political factors, such as election manifestos/ political initiatives, international agreements, humanitarian issues and public opinion; and local public service events, such as performance issues/ crises and new leadership.

6.2.3 Comparisons between public and private sector environments for innovation

The objectives of innovation

In both the private and public sector, the purpose of innovation is to improve the performance of an organisation. In the private sector, overall performance is measured in terms of shareholder value (Hood & Rothstien, 2000) and survival (Fiol & Lyles, 1985). In the public sector, the aim is much more difficult to define. There may be specific targets to improve services to citizens (Hood & Rothstein, 2000) or reach disadvantaged citizens (Ling, 2002) or there may be somewhat imprecise mission statements (Naschold, 1996), such as to generate urban renewal or enhance criminal justice (Ling, 2002), which are difficult to measure. Income is important to both private and public organisations. In the private sector, income depends on market performance, while in the public sector, it depends on market performance and/ or centrally allocated funds.

Accountability to shareholders is much clearer in the private sector (Naschold, 1996), compared with the public sector, where there may be multiple stakeholders with contradictory expectations (Naschold, 1996). In high profile public services, performance will be overseen by politicians, who, in turn, may have multiple

stakeholders, a hostile opposition, a media who are keen to investigate any potential failure and who are subject to political cycles (Halvorsen, 2006; Hartley, 2013).

In the private sector, the value of innovations is assessed in terms of economic indicators, such as the contribution to the bottom line or return on investment (Hughes et al, 2011). In the public sector, such economic indicators may not exist (Naschold, 1996). Instead, there are likely to be social indicators, which tend to be difficult to specify and measure (Hughes et al, 2011).

The structural environment

Although different sectors vary widely, typically, the structure of private sectors is fragmented, with frequent new entrants, leading to strong market competition and, theoretically, greater innovation (Halvorsen et al, 2006). On the other hand, the public sector often consists of mature monopolies, with little or no competition (Halvorsen et al, 2006; Ernst & Young, 2017). However, according to Hartley et al (2013), it is a myth that this inevitably means there is greater innovation in the private than in the public sector. A further point is that private sector firms have direct feedback on their price/ quality performance from customer sales (Halvorsen et al, 2006).

Private sector firms also enjoy advantages, for which there are few equivalents in the public sector, in terms of highly developed models of institutional support – for example, open innovation conventions, venture capital seed money and IPR conventions; and internal structural benefits, such as in-house R&D facilities and management performance bonuses (Borins, 2006; Halvorsen et al, 2006; Mulgan, 2014). According to Mulgan (2014), there need to be national systems supporting innovation in, say, the health and education sectors because it is inefficient and risky for individual hospitals and colleges to conduct experimental innovation. In fact, "the government treats innovation as an interesting side-line rather than as fundamental to success" (European Commission, 2013 - quoting Mulgan, G. back page) with the occasional top-down imposition of unproven ideas (Mulgan, 2014).

Other factors

Other factors which disadvantage public sector innovation compared with private sector innovation include: less certainty over the availability of long term strategic resources and the difficulties of being tied to annual capital and revenue budgets (Naschold, 1996); frequent lack of authorisation to plough back savings from innovations into the business (Hartley et al, 2013); CEOs who are often risk averse and/ or on short term tenures (Heffron, 1989); highly unionised or professionalised work forces (Halvorsen et al, 2006); and constraints imposed by procurement rules and the Freedom of Information Act (Ling, 2002). On the other hand, public sector organisations are often quite large, and this should have a scale advantage for innovation (Hartley et al, 2013).

6.3 KEY ISSUES IN THE UK TERTIARY EDUCATION SECTOR HAVING A BEARING ON INNOVATION,

6.3.1 Introduction

The latter half of the 20th century saw a massive increase in further and higher education in the UK and much of the Western world (Ferlie et al, 2008; Colet, 2017). By the 1980s, this and other public expenditure was putting a severe strain on national budgets. The government response, begun in the Thatcherite era, has been to attempt to roll back the state and to implement new public management reform in public services (Ferlie et al, 2008). As the TES in the UK is highly structured and regulated and heavily funded by the government, the new public management reform agenda has steered a transformation in higher education (HE) (Ferlie et al, 2008) and an even greater transformation in further education (FE), where the level of government control and intervention is more pronounced than in the HE sector (Shain & Gleeson, 1999).

One driver was the Jarratt Report (1985) – an enquiry into UK HE, commissioned by the Committee of Vice-Chancellors and Principals. The main recommendation was to implement business models of management with increased accountability for performance, more competition between providers and a greater choice for consumers,

ie students (Deem & Brehony, 2005). This is often labeled a managerial as opposed to a professional philosophy.

Another angle on the increase in tertiary education student numbers and the rise of student choice is government pressure towards the inclusion of disadvantaged students (O'Donnell, 2016). This is associated with a rise of populist universities, who, like further education colleges, have a focus on widening participation and a vocational curriculum. Meanwhile, there exists the elite Russell Group of universities, whose historical mission has been to maximize prestige through their reputation for research (Maassen, 2017). In the middle, there is a large group of universities searching for a viable mission – a topic familiar in the USA as well as the UK (Cox, 2016; McClure, 2016).

A second influence, affecting HE rather than FE, is government encouragement for universities to play their part in national and regional economic development. This is sometimes called the triple helix configuration of relationships between universities, businesses and government agencies (Etzkowitz and Leydesdorff, 2000).

There are several other pressures. One is globalization (Ferlie et al, 2008; Husig & Mann, 2010). Two examples of this are the Bologna and Copenhagen agreements. The former aims to ensure international compatibility in the standards and quality of HE qualifications and the latter has similar aims for vocational training (Powell & Solga, 2010). A further example of globalization is the competition for international students on both traditional face-to-face courses and on distance learning courses (Seeber, 2016). Another pressure is new technology, particularly e-learning (Schneckenberg, 2009; Husig & Mann, 2010; Marshall, 2011; Marcy, 2014). In the last 10 years this has started to make a significant impact on the nature of teaching and learning. The pressures of globalisation and technology co-join in the form of MOOCS (massive open on-line courses), which poses a potential threat to the traditional campus model of HE (Purcell, 2014; Kalman, 2014; Schuwer, 2015; Ossiannilsson et al, 2016). Finally, one should not forget core pedagogical innovative changes, of which in a recent study, Walder (2017) identified 51 examples.

The above developments have led to a degree of uncertainty on the part of UK HE and FE institutions as to their purpose, value, governance and, of course, core funding streams (Colet, 2017). According to the European Commission (2014), in order to enhance quality and maintain competiveness, the TES must embrace new technologies, blended learning and a student-centred model of learning.

Several issues are now discussed in more detail. These issues tend to be more relevant to universities than to FE colleges.

6.3.2 The transformation from a professional to a managerial approach

The most significant change in the TES has been the transformation from a professional to a managerial approach. This involves a re-alignment of goals from democracy and legitimacy to efficiency, value for money and performance and has posed a threat to the Mertonian philosophy of academic knowledge development (Ferlie et al, 2008). It means the pre-eminence of markets rather than planning – with the encouragement of competition between existing providers, the introduction of new providers (Shain & Gleeson, 1999) and increased choice for students with real prices as tuition fees (Ferlie et al, 2008). In order to manage a reduction in funding, TES institutions have had to explore alternative revenue streams (Ferlie et al, 2008) and implement tighter financial controls (Deem & Brehony, 2005). There have also been cycles of staff redundancies, particularly in the FE sector (Shain & Gleeson, 1999). Instead of self-regulation, there has been the pervasive introduction of performance monitoring and audit regimes (Ferlie et al, 2008). This includes academic performance as well as financial performance with an emphasis on outcomes rather than processes (Shain & Gleeson, 1999). At the organisational level, this has led to an increase in target setting and benchmarking and the widespread use of league table rankings (Deem & Brehony, 2005). Finally, there has been the introduction of professional managers and administrators, some of whom are new to the sector but many of whom are re-

designated academics playing a dual role - vice-chancellors and heads of department being prime examples (Ferlie et al, 2008).

According to Pilbeam & Jamieson (2010), the rise of a managerial philosophy and the need to be business facing has meant a greater need for internal co-ordination and external liaison. They believe that the role of pro-vice chancellors has become key in this respect – in particular, their strategic role in developing and monitoring strategic plans and their operational role in managing staff and implementing policy changes. Apart from universities having a relatively decentralized decision making structure (Kolbe & Nikolopoulos, 2007), there are several different internal constituencies and conflicts of interest to co-ordinate – including the different subject disciplines, academic and support staff and research and teaching (Pilbeam & Jamieson, 2010). Externally, there is a liaison role with the government, with several national and local agencies and with other universities (Pilbeam & Jamieson, 2010). The pro vice chancellor needs to represent the college externally and disseminate information internally (Pilbeam & Jamieson, 2010). However, if a university is to play its role as a knowledge hub, this boundary spanning function must be played at every level (Youtie & Shapira, 2008). These changes have also led to the development of professional administrators, who undertake cross-cutting roles in areas such student welfare, human resource development and business enterprise development. The response of individual institutions has often been significant mission change (Husig & Mann, 2010). For example, in the early 1990s, Aston University undertook a comprehensive top down demand-led strategy exercise, resulting in a technology focus, the halving of departments and staff and the implementation of institution wide total quality management (Clayton, 1993).

It is not surprising that the re-definition of the purpose of a university coupled with the decline in the professional approach has often led to resistance by academic staff – especially where there have been redundancies and the restriction of traditional career paths (Shain & Gleeson, 1999). Schneckenberg (2009) also believes that academic structures and practices have led to issues with implementing innovations such as e-learning – for example: research tends to take precedence over teaching and learning

practice, and this lowers management commitment to teaching and learning changes; departmental heads have relatively little control in ensuring consistency in take-up and approach; and, finally, young academics might be expected to be most enthusiastic about change, but typically they have relatively insecure positions. However, generally there has been an acceptance of the aim of providing a quality offering to students and the need to be flexible to meet genuine changing environmental circumstances (Shain & Gleeson, 1999), and there are many instances of compromise. For example, managerial structures have been overlaid on top of existing collegiate representative structures (Kolsaker, 2008). Another example, is where performance appraisal, instead of being judgemental, is used as a mechanism for continuing professional development (Kolsaker, 2008). As Kolsaker, concludes, an academic still has rather a lot of freedom in their working life.

There have been criticisms of the proliferation of associated measures for audit and control (Kolsaker, 2008). Findlow (2008) believes bureaucratic rules and targets have stifled innovation and quality improvement. Hartley (1995) has called this the McDonaldization of HE. And one empirical study comparing professional versus managerial leadership, showed that performance variations were due to student backgrounds and resource issues and not to the leadership style (Currie et al, 2009). Green (2003) and Ferlie et al (2008) have separately proposed that a better organisational design would be a collaborative solution.

6.3.3 Benchmarking and league tables

A specific phenomenon that has gained prominence in public services in recent years has been the publication of league tables where institutions are ranked on one or more dimensions of performance. Two very different examples in the TES, are The Guardian University League Tables and The Times Higher Education World University Rankings. The former aims to assist potential university students chose an institution and is partly a response to growing student expectations (the marketization of HE (King, 2009)): and the latter is a corporate benchmarking tool for elite universities (Deem & Brehony, 2005). As with all league tables, they have been criticized for their simplicity and criteria (King, 2009). However, according to Bastedo & Bowman

(2011), they do seem to work, as they found a lagged correlation between the rankings of colleges in the US News rankings with subsequent college financial performance. An interesting question about ranking and benchmarking is whether they encourage conformity or differentiation, and, as the measures are often simplistic, whether colleges sub-optimally target such proxy measures rather than their real strategic objectives.

6.3.4 The role of the TES in growth

A further pressure for mission change is the expectation that the TES, especially universities, should play a prominent role in regional and national economic growth. Etzkowitz and Leydesdorff (2000) called the three-way linkages between universities (the instigators of novelty), industry (the generators of wealth) and government (who set the rules and act as the public sector entrepreneur) the triple helix. According to Etzkowitz and Leydesdorff (2000), in the laissez-faire configuration, as exists in the USA and the EU, it is business which drives innovation, with universities providing skilled human capital and government providing the regulatory framework.

Etzkowitz & Leydesdorff (2000) described the entrepreneurial university as being at the heart of the triple helix concept. In this new mission, the university not only generates basic research but can develop intellectual property and apply it in a commercial setting (Etzkowitz & Leydesdorff, 2000; Rothaermel et al, 2007). Above all, it plays a central collaborative role in knowledge production, diversification and transfer (Etzkowitz & Leydesdorff, 2000). Universities are not just a production line to supply human capital within the usual knowledge domains but have undertaken a shift in the curricula from basic research to applied research (Rothaermel et al, 2007). Furthermore, they are being instrumental in providing the entrepreneurial talent of the future through incubators, spin-offs and science parks (Etzkowitz & Leydesdorff, 2000; Link & Scott, 2003; Rothaermel et al, 2007). Technological breakthroughs in such areas as computing, biotechnology and nanotechnology have been a particular focus (Rothaermel, 2007). Western Europe has lagged behind the USA in the realisation of the entrepreneurial university concept (Rothaermel, 2007).

More recently, the role of the university has widened still into what has become known as the 'third stream'. This recognizes that a university is often a large and significant employer in any local community and has significant resources to be a catalyst in local social and cultural development and especially in regional regeneration (Frost, 2010, 2016).

6.3.5 Collaboration between universities and private sector firms

Ankrah (2015) conducted a meta-analysis of 1500 articles concerning university-industry collaboration and found that the benefits to firms is access to new technologies and/ or complementary expertise, leading to the introduction of new products/ services; and the benefit to universities is a source of revenue and work experience opportunities for students.

Kitagawa (2004) has identified three categories of collaboration. Firstly, there are relationships between world class universities and multi-national companies, who often have substantial research and development departments of their own. Secondly, there are relationships between universities and businesses and agencies in their local region. This echoes what was described above as third stream activity. Thirdly, there is the specific fostering of relationships with small high technology firms, who perhaps have good ideas but not the management skills or contacts to exploit these ideas. Hewitt-Dundas (2012) found that universities with a high research intensity tend to collaborate with businesses concerning the development and exploitation of IPR, whereas low research intensity universities tend to collaborate with businesses concerning the development of human capital. Typically, manufacturing firms have more university links than do service firms (Howells et al, 2012). Presumably, this is because service firms are relatively low technology users at the moment, but this must be an area of opportunity in the future.

Differences in regional economic activity and wealth generation have led the UK government and the EU to target specific regional financial and infrastructure support (Kitigawa, 2004). In the UK, Regional Development Associations (RDAs) were established in 1999 specifically to support regional regeneration (Kitigawa, 2004) and although the RDAs have recently been disbanded, they have been replaced by similar

Local Enterprise Partnerships. Huggins & Johnston (2009) have criticised the value of universities in this regional role since the wealth generating and knowledge commercialisation capacity of universities is less in weaker regions than in stronger ones and the innovation and economic performance of a region is inversely related to the dependency of businesses on local universities.

Part of the problem concerning the usefulness of universities to businesses is the inherent differences in culture and values. Academics tend to take a Mertonian view of knowledge as opposed to a commercial view (Bruneel et al, 2010). This may be changing with the rise of entrepreneurialism in universities. Another problem is that academics are likely to have a much longer time horizon than business people (Cyert & Goodman, 1997; Bruneel et al, 2010). A further problem is that knowledge associated with new technologies is likely to be complex, abstract and ambiguous – giving considerable opportunities for misunderstandings (Cyert & Goodman, 2004). Finally, academics live in a relatively stable world, whereas the business world is always vulnerable to exogenous shocks (Cyert & Goodman, 2004). Steinmo (2015) and Al-Tabaa & Ankrah (2016) have suggested the need for the development of social capital, eg common goals and personal relationships.

6.3.6 Isomorphism in the TES

There have been several studies which have explored institutional isomorphism (as described in Chapter 3) in TES. The evidence is inconclusive. For example, in three examples (Kraatz & Zajac, 1996; Morphew, 2009; Doyle & Gorbunov, 2011), there is no trend at all towards homogeneity; while in three further examples – one (Cooke & Lang, 2009) finds homogeneity due to government pressure; one (Robinson, 2011) finds institutionalisation due to student choice; and in one (Jacquette, 2013), the situation is ambiguous.

6.4 THE RESEARCH STUDY BY HANNAN & SILVER (2000)

6.4.1 Introduction

This is the most relevant study seeking a comprehensive evaluation of innovation in teaching and learning in UK universities. Although now nearly 20 years old, its format

and findings are still useful background information. There has not been an equivalent study in respect of FE colleges. The first phase was undertaken in 1997-8 and focussed on innovation from an individual academic's perspective. It consisted of 221 interviews in 15 universities. The second phase was undertaken in 1998-9 and focussed on innovation from an institution's perspective, including consideration of structures and frameworks, processes and culture. It consisted of 117 interviews in five universities. Interestingly, Hannan & Silver (2000) used two innovation topics as vehicles for part of the second phase case studies – which is exactly what this author has done in the case study in this research.

There have been other studies of TES outside the UK, but the circumstances have been different and not readily generalizable to the UK - for example, O'Banion's (2012) review of innovation awards to US community colleges and Tomas & Castro's (2011) study of six innovations in three Catalan universities. A more promising recent study is that by Lasakova et al (2017), which investigated 10 European universities, including two from the UK, with the specific purpose of identifying enablers and barriers to innovation. Their findings are compared with those of Hannan & Silver (2000) in the next section.

The remaining sub-sections summarise Hannan & Silver's (2000) findings and conclusions.

6.4.2 Institutional drivers

From an institutional viewpoint, around the 1990s, there had been several drivers for change. Firstly, there was a huge rise in student numbers that continued into the 2000s. This brought issues of funding, efficiency and quality. Secondly, there was the demand that universities should be accountable. The main instruments were the Teaching Quality Assessment and the Research Assessment Exercise. Thirdly, there were several government funded initiatives aiming to raise the quality of teaching and learning – for example, Enterprise in Higher Education, the Open Learning Foundation and HE for Capability. Although these initiatives were instigated by funding agencies, there was no central control or uniformity of interpretation. Often, the innovations were

short lived and, even if successful, were not rolled out to other institutions. Fourthly, there were curricula changes. There were new delivery formats such as modularisation and semesterisation and new subject areas such as business studies. Finally, there were new technologies.

The response of universities to these drivers and, in particular, to the Dearing Report (1997), was to instigate new policies and associated structural and cultural changes. In terms of policy, teaching and learning became embedded into corporate plans and teaching and learning strategies; structural changes included, for example, setting up a central teaching & learning development unit and the appointment of a pro vice chancellor and other senior appointments dedicated to teaching and learning; cultural changes included the more up front role of the senior management team and increasingly a managerial rather than collegiate atmosphere.

The mature "elite" universities, because of their greater reputation and greater income, were much less affected by these changes compared with the post 1960 and 1992 universities. As Hannan et al (1999) state "For certain institutions, the nature of their intake has remained more or less constant, demands of employers fairly distant and the temptations of government advocated reforms generally resistible, despite the necessity of some token effort. " (p.287). The differences between the old and new universities were particularly evident with regard to research. The old universities strove for excellence in research with the belief that this is the best way of ensuring the consequential excellence in teaching and learning. Most post 1992 universities did not have the capacity to make research such a high priority even if they wanted to. The post-1960 universities sat somewhere in the middle.

From a departmental perspective, these structural, policy and cultural changes had a profound effect. Hitherto, departments were very much isolated professionals tending clusters of knowledge. They would tend to collaborate more with similar departments in other universities rather than other departments within their own university. They had a very high degree of autonomy. The changes brought centralised decision making, a demand for uniformity and greatly increased bureaucracy, such as consensus making devices such as committees.

From an individual's perspective, there was an even greater loss of autonomy. Sometimes, teachers could not understand or cope with changes – for example the change to be "facilitators" of learning. Often there was inadequate training and a lack of incentives to change. Although the quality of teaching and learning was introduced into academic staff appraisals, it rarely led to promotion because a) it could not be evidenced or measured and b) it was often regarded as less important than research, or even administration.

6.4.3 Enablers and barriers to innovation

Hannan & Silver's (2000) enablers and barriers are now compared with those in Lasakova et al's (2017) study. Firstly, Hannan & Silver (2000) identified institutional support in terms of favourable financial policies and flexible procedures as important enablers. In fact, frequently, they found that institutional policies and procedures were a barrier, rather than an enabler, especially quality assessment procedures, which were overly bureaucratic and discouraged any deviation from the status quo. On a similar theme, Lasakova et al (2017) chose to highlight a frequent mis-match between innovation strategy and supporting policies on the ground and the inflexible and bureaucratic access to external funding. Lasakova et al (2017) also highlight a more practical source of difficulties, the frequent incompatibility of ICT facilities. Secondly, Hannan & Silver (2000) identified the need for enthusiastic encouragement – for example, senior management positively encouraging innovation and enthusiasm being shown by academic colleagues and the institution as a whole in disseminating the results of any innovation. Lasakova et al (2017) take a more instrumental perspective and highlight the lack of rewards for innovation effort. Thirdly, Hannan & Silver (2000) identified the importance of teaching and learning having equal importance with research in terms of esteem, recognition of innovation, budgetary allocations and career progression. This is not mentioned by Lasakova et al (2017), but they do mention the lack of trust between academia and the business environment, due to different mind-sets/ prejudices. Finally, Lasakova et al (2017) also mention the problem of resistance to change by both staff and students – particularly relating to new technology and the lack of skills and fear of the unknown. This is not mentioned by Hannan & Silver

(2000). In a later paper, Hannan (2005) remarked that innovation is unlikely to be successful unless enhancing the learning of students is a policy and practical priority.

6.4.4 Innovation themes

Hannan & Silver identify two general dimensions of innovation. The first is who initiates the innovation – the individual, the institution or the funding agency. The second is what is the purpose of the innovation - pedagogic versus curricula versus managerial. Hannan & Silvers's book describes various innovations and lists of innovations. These innovations can be distilled into the following themes.

Theme 1

There has been a tendency towards group work – seminars rather than lectures and group rather than individual projects. There has also been an increase in real world problem solving and oral presentations by students. As well as being a different delivery format, with efficiency and effectiveness ramifications, group work also provides a student with the opportunity to learn new skills particularly valuable in the work place.

Theme 2

There has been an increase in student directed learning/ resource based learning/ distance learning. Again, this innovation has efficiency and effectiveness ramifications as well as pedagogic.

Theme 3

Both innovations 1. and 2. have been made possible by new technologies.

Theme 4

There have been changes in assessment procedures, especially following increases in student numbers and modularisation.

Theme 5

There have been staff related changes eg peer group mentoring.

6.5 Chapter summary

This chapter has provided background information which may assist a reader's contextual understanding of the tertiary education sector (TES). The first section set out a general comparison concerning innovation in the public sector compared with the private sector. The second section discussed key issues in the tertiary education sector: especially a professional versus managerial philosophy and the role of the tertiary education sector in UK industry and regional development. The third section described Hannan & Silver's (2000) comprehensive study of innovation in the sector.

CHAPTER SEVEN

METHODOLOGY

7.1 INTRODUCTION

This chapter explains how the research was devised and conducted. It covers four topics: research philosophy; research design; survey; and case study. The research philosophy explains the stance taken with regard to the nature of knowledge and to how knowledge was gathered and verified. The research design explains why a mixed quantitative and qualitative design was chosen and discusses the approach to reliability, validity and risk management. The survey section explains the choice of the population of institutions, the design of the questionnaire, the detailed operationalisation of the concepts and how the survey was conducted, and the data analysed. The case study section explains how the institutions, innovations and interviewees were selected and how the case study was conducted, and the data analysed.

7.2 RESEARCH PHILOSOPHY

One's research philosophy largely determines how one sets out the research questions and one's overall research approach. It is customary to distinguish two aspects of research philosophy:

i) Whether one takes a positivist, or some alternative stance, to thinking about the nature of knowledge;
ii) Whether one takes a deductive or inductive stance to gathering and verifying knowledge.

7.2.1 The nature of knowledge

It is usual in methodology text books to understand the nature of knowledge in terms of two philosophical concepts, ontology and epistemology (Hussey & Hussey, 1997; Bryman, 2015; Bryman & Bell, 2015). Ontology is the theory of being and asks whether there is an intrinsic reality, a real world, that is independent of our knowledge or whether there is only a construction of our imagination (Bryman, 2015). In the former case, the subject of a study is governed by external systematic rules and in the latter case, it is fluid and governed by myriad circumstances and the agendas of the social actors (Bryman, 2015). Epistemology is the theory of knowledge and, specifically in theses concerning management topics, asks whether the social world is structured in the same terms as the physical world (Bryman, 2015). In particular, does one attempt to **explain** behaviour in terms of objective external forces by **observing** cause and effect relationships or does one attempt to **understand** behaviour by **interpreting** cause and effect relationships (Bryman, 2015).

Following on from the above, it is customary to distinguish two distinct research philosophies – positivism and interpretivism (Saunders et al, 2011; Bryman, 2015; Bryman & Bell, 2015). The "traditional" research philosophy is positivism. Knowledge is acquired through observation. These observations (facts) are used to explain fundamental laws of nature, which can be tested by objective, rigorous methods (Bryman, 2015). On the other hand, in an interpretivist philosophy, the domain is the social world and the aim is to use observations to understand (rather than to explain) the subject matter, typically human behaviour (Bryman, 2015). This approach is not objective but based on the subjective perspectives of the study subjects (Bryman, 2015). Interpretivism takes a constructionist view of reality by recognising that situations are very complex and constantly changing and are heavily contingent on the context and the perspective of the observers (Bryman, 2015). Positivism is poor at understanding social problems but good at validation, whilst interpretivism is good at understanding social problems but poor at validation (Bryman, 2015).

A phenomenological approach takes an interpretivist philosophy further with the premise that research can only be of subjective perceptions of phenomena as there is no

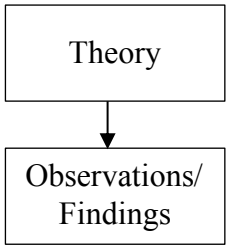
underlying being (Hussey & Hussey, 1997). However, this thesis essentially takes a critical realist approach (May, 2001). This approach is based on the ideas of Bhaskar (1989) and has elements of both positivism and interpretivism. Bhaskar (2008) and Archer et al (2007) explain critical realism in terms of three layers of reality. The middle layer consists of "actual" events, such as human behaviour. Beneath this layer, is the "real" world of explanatory ideas/ laws, such as gravity or human nature. This has similarities to the positivist approach. In this thesis, the prime aim is to explain the underlying relationship between collaboration and innovation. According to the critical realist, such ideas/ laws cannot be directly observed (sensed), only derived from observations in the actual world. Like interpretivism, critical realism recognises the fluidity of the observable subject matter and the importance of context. The top layer is the empirical world, where events are observed, and the real world is speculated about. This layer is dependent on the perspective of the researcher. Again, this is similar to interpretivism. Thus, the critical realist believes in the objective world of the positivist, but understands, like the interpretivist, that interpretations are subjective (Vincent & O'Mahoney, 2014). Also, critical realism attempts to embody the "thick" understanding of the interpretivist, as against the "thin" explanation of the positivist, and the validating rigour of the positivist, as against the passive acceptance of the interpretivist (Vincent & O'Mahoney, 2014). Critical realism attempts to improve the rigour of the validation process by the use of techniques for their "critical" evaluation (Mooney, 2016).

7.2.2 Gathering and verifying data

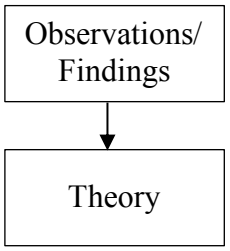
With regard to the process of developing knowledge, it is usual in text books to differentiate between a deductive approach and an inductive approach (Bryman, 2015; Saunders et al, 2011). These approaches are encapsulated in the following comparative diagrams.

Figure 7.1 Inductive versus deductive approach

Deductive approach



Inductive approach



Source = Bryman (2015)

In the deductive approach, a theoretical proposition is logically deduced from existing knowledge. This is expressed in the form of a hypothesis. The concepts are operationalised, and associated data is collected. The results are analysed to produce findings, which either validate or falsify the hypothesis. The findings are added to the stock of existing knowledge. In practice, the process may be iterative. (Summarised from Bryman & Bell, 2015).

In the inductive approach, observations are made concerning a specific research topic. These observations are analysed to generate theories. In many specific inductive methodologies, such as grounded theory, this phase is in fact a sequence of iterative deductive steps, where each new observation is used to reconceptualise/ consolidate the emergent theory (Strauss & Corbin, 1998).

The deductive approach is usually associated with a quantitative research strategy and the inductive approach with a qualitative research strategy. The essential differences between these two strategies are set out in Table 7.1.

Table 7.1 Comparison between quantitative and qualitative research strategies

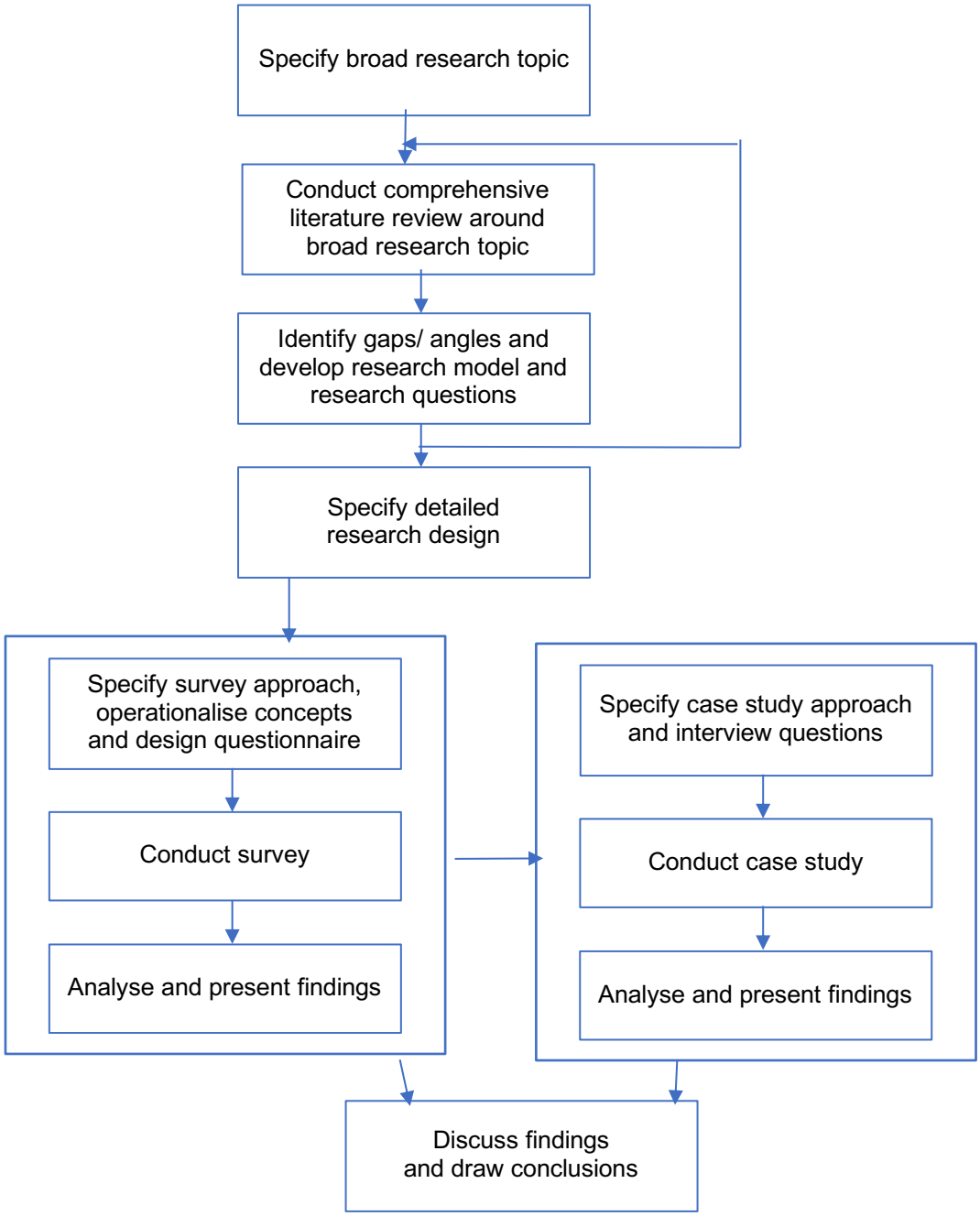
	Quantitative Strategy	Qualitative Strategy
Position of theory	Deductive – testing of theory	Inductive – generation of theory
Epistemology	Positivist	Interpretivist/ critical realist
Ontology	Objective view of the world	Constructionist view of the world
Nature of the data	Numerical – able to be measured using statistical techniques	Usually textual – analysed using some form of pattern matching technique
Nature of output	Generalisation from the sample to the population	Rich emergent themes underlying the data

Source= based on Bryman (2015)

In this research, the quantitative survey used essentially a deductive approach. Specific research objectives were specified, data was collected using a questionnaire survey and these were analysed using statistical techniques. Specific answers were obtained. The qualitative case study used a hybrid approach. Broad questions were posed, and data was collected through interviews and these were analysed using thematic analysis techniques. The thematic analysis consisted of both a pre-designed framework of categories and categories that emerged from the data. The thematic output means the qualitative research was more akin to a critical realist approach than to a purely interpretivist approach.

The overall research process for this thesis is set out overleaf in Figure 7.2.

Figure 7.2 Overall research process for this thesis



Source = Author

7.3 RESEARCH DESIGN

7.3.1 Design fundamentals

Chapter 5 specifies the research questions and objectives and develops the survey and case study research models. This section discusses the fundamentals of the detailed research design.

Mixed methods approach

The main aim of using both a quantitative and qualitative approach is to explore the research topic from two complementary angles (Creswell & Clark, 2011; Cresswell, 2013). Firstly, it is intended to be able to say something generally about the two main research questions. This requires a statistical approach. The findings are necessarily black and white and somewhat simplistic. However, they do say something about the whole population (De Vaus, 2013). As the data does not already exist, fresh data had to be collected. Observation would be prohibitively expensive of time and impractical, and so the data had to be collected "second hand" from actual participants. This means a questionnaire survey (De Vaus, 2013). Secondly, it is intended to be able to explore the underlying innovation processes and explanations for why collaborative and learning/ conforming decisions are made. This requires a qualitative approach (Ormston et al, 2013). Essentially, the research probes with actual participants why they and their colleagues behaved as they did and made the decisions that they did. This means a system of interviews collectively assembled in the form of a bounded case study, where the findings can be nuanced and complex, but also somewhat narrow in their reference points.

A second reason for a mixed methods approach is methodological triangulation. Denzin (1970) defines triangulation as "the combination of methodologies in the study of the same phenomenon" (P297). He believes that if different methods lead to the same conclusion, then this increases reliability and validity. In this thesis, both a survey and case study approach are adopted. Another aspect of triangulation is the use of multiple sources of data (Easterby-Smith et al, 2012). In this research, for example,

the case studies involve multiple institutions, and within each institution, multiple innovation cases and multiple interviewee roles.

A third reason for a mixed methods approach is practical. One advantage of doing the survey and case study in sequence is that the second enquiry can be designed to use the findings from the first enquiry. For example, if one does the case study first, the subsequent survey can focus on testing any emergent theories. And if one does the survey first, the case study can explore in depth any anomalies that are found in the survey. There are two drawbacks to both approaches. Firstly, there is an assumption that the first enquiry will identify an important and unexpected novel theory. This is quite a high risk strategy. Secondly, by asking the second enquiry to focus on a narrow research question, the advantages of triangulation are lost. In this research, the survey was conducted first for two important reasons – one theoretical and one practical. It was not known whether the secondary research question concerning the competing influences of organisational learning and institutional conforming would lead to interesting results. The specification of the case study was not firmed up until the survey found that this question is indeed an interesting one. Secondly, the survey contains several open questions in which the respondent is asked to specify important strategic innovations that their institution had recently introduced. By analysing these responses, candidate innovations were found for two generic innovation categories to be studied in the case studies. In terms of Creswell & Clark (2011) typologies, this research is a hybrid. It adopts a convergent parallel approach in respect of the generation of theory – ie the quantitative and qualitative results are analysed independently and then aggregated together for the purposes of interpretation in Chapter 10 – Discussion. However, for practical considerations, the approach is explanatory, in that the quantitative survey is conducted before the qualitative case study.

Exploratory, descriptive and explanatory research questions

Research questions are sometimes categorised as being either exploratory, descriptive or explanatory (Yin, 2011, 2013; Saunders et al, 2011). Broadly, exploratory questions seek to identify theories, descriptive questions seek real life profiles of

attributes relating to research phenomena and explanatory questions seek to find causal associations between variables. According to Yin (2011, 2013), social scientists used to believe that certain forms of enquiry are suitable for only one type of question eg case studies are only good for exploratory questions, surveys for descriptive questions and experiments for explanatory questions. Yin (2011, 2013) dispels this belief convincingly and argues that most forms of enquiry can be matched to all three types of research question. In this study, Research Objective 1 is descriptive; Research Objectives 2, 3,6,7 and 9 are explanatory; and Research Objectives 4,5, 8 and 10 are descriptive, explanatory and exploratory.

Other methodological considerations

There are two other important methodological variables that describe the nature of this research – the unit of analysis and the time frame for the research. The unit of analysis is primarily an institution and within that, for finer grained analysis, it is collaborator and innovation. In terms of time frame, this is a static study, ie it is not attempting to evaluate differential findings over time. The assumption is that the contextual variables do not change significantly during the period of research, for example between the survey and the case study. However, in this study, the Browne Report (2010) was published between the survey and the case study. The effect of this and other contextual changes need to be assessed. The other methodological importance of the time frame is that static studies cannot test for causality, although it is possible to make some plausible assumptions based on logical path analysis.

7.3.2 Credibility

Reliability and validity

Bryman (2015) defines reliability as the consistency of a measure of a concept and validity as whether a measure actually reflects the concept. Reliability and validity set very different problems for quantitative versus qualitative approaches, respectively.

With regard to quantitative research, Sekaran and Bougie (2010) identify two types of reliability. Stability is where there is consistency of results even though some methodological parameters may change eg the timing of the research or having multiple researchers. These are not issues in this study. Their other type of reliability apply specifically to the design of questionnaire scales. The issue is whether the scale items hang together to measure the desired concept. Factor and reliability analyses are two techniques used to assess this aspect of reliability. This topic is covered in Section 8.2.2. Sekaran and Bougie (2010) identify three types of validity. Content validity is where a concept has a complex or multi-faceted meaning. The issue is whether the measure comprehensively covers the whole domain of the concept. Criterion validity concerns whether the measure correctly and consistently allocates responses to the correct buckets as defined by the concept. De Vaus (2013) also includes situations where studies incorporate previously used scales and asks do the new results correspond with previous results. Construct validity concerns whether the findings accord with those findings expected from theory. Hussey & Hussey (1997) also includes situations where the concept is not directly observable eg motivation and asks are the proxy indicators good substitutes.

With regard to qualitative research, Guba & Lincoln's (1994) concept of trustworthiness consists of four sub-concepts. Credibility is the equivalent of internal validity. It arises because there may be alternative explanations for relationships between social phenomena. They suggest that findings should be fed back to the participants for their comments. This is often called respondent validity. Transferability is the equivalent of external validity. It is the ability to generalise to other contexts. They suggest that contexts should have "thick descriptions" so that detailed comparisons can be made with alternative contexts. Dependability is equivalent to reliability. They suggest that an audit approach should be adopted with a record of research processes and data. Confirmability is ensuring that an objective rather than a subjective approach and interpretation is adopted. Again, the solution is an audit approach. Yin (2011, 2013) has four criteria for assessing credibility in case studies. Construct validity is similar to Guba's confirmability ie that objective rather than subjective operational measures are used. He suggests having multiple sources of

evidence and ensuring one can logically chain elements of evidence to each other – for example research objectives to interview questions. Internal validity concerns making the correct inferences from the data. He suggests several techniques – ensuring alternative rival explanations are considered; assessing whether evidence converges on the same explanation; assessing whether empirical evidence matches predicted theories and predicted data patterns. External validity is the extent to which one can use the findings to generalise to other situations. He calls this analytical generalisation. He suggests thick descriptions and the replication of findings – for example by having multiple institutions, multiple interviewee roles and multiple innovations for each innovation type. This is a somewhat different approach to Guba's transferability concept. Reliability is whether the research could be repeatable. His solution is to ensure a fully documented audit record is kept.

Applying the above ideas to this research, quantitative research, such as a questionnaire survey, has the potential to have a high reliability but a low validity; whereas qualitative research, such as a case study consisting of mainly semi-structured interviews, has the potential to have a low reliability but a high validity (Bryman, 2015). This is because of differences in two key research process variables. In a questionnaire survey, the overall process may be long and complex, but it can be broken down into small steps each of which leave little room for manoeuvre. Hence, it is repeatable fairly exactly and therefore potentially has a high reliability (Bryman, 2015; De Vaus, 2015). In a semi-structured interview, the essence is to have a framework but then to probe creatively within this framework and to vary one's probing depending upon the responses. No two interviews are the same. In fact, interviews involving the same interviewer and interviewee and the same subject matter, but on different days, could be different. And, of course, interviews by two different researchers, unless very well coached over a period of time, are likely to be different. This leads to a potentially low level of reliability (Yin, 2013; Bryman, 2015). The other key difference in the research process is to do with the degree of complexity of the questions. In a questionnaire survey, especially if written, individual questions and the introduction to questions is often necessarily brief and simplistic. If one is dealing with complex concepts, there is considerable scope for imprecision, ambiguity and varied interpretation. This potentially means a low validity (Bryman, 2015; De Vaus,

2015). On the other hand, in an interview, there is usually time for explaining concepts fully and, through interaction, for making sure that the concepts are understood. Additionally, through the probing there is the opportunity to probe for subtle nuances. This greater depth of interaction potentially means a high validity (Yin, 2013; Bryman, 2015).

Measures to counter the above problems concerning reliability and validity are dealt with in detail in the two sections on the survey and the case study, respectively, and are summarised in Table 7.2.

Table 7.2 Summary of the threats to validity and reliability and how they are minimised in this research

	Survey	Case Study
Steps to improve validity	Preliminary review of the research design and especially the questionnaire with experts. Pilot the questionnaire. Ensure all participants are thoroughly briefed. Ensure the questionnaire design and wording is easily followed and understood. Ensure careful operationalization of concepts.	Review interview protocols with experts. Pilot the case study. Use multiple institutions and interviewee roles. Ensure interview questions relate to research questions. Ensure all participants are comprehensively briefed. Ensure by listening that interviewees understand concepts. Provide regular feedback to interviewees. Use sophisticated data analysis techniques, such as pattern matching and addressing rival explanations.
Steps to improve reliability	Systematic and consistent use of best practice. Maintenance of database and audit trails. Careful selection of participants to minimise bias. Careful wording to minimise bias. Careful design of scales.	Systematic and consistent use of best practice. Maintenance of database and audit trails. Careful selection of institutions and interviewees to minimise bias. Neutral attitude in interviews and no leading questions so as to minimise bias.

Source=Author

Generalisation

The third aspect of credibility is generalisation. Vogt's (1993, p.99) definition is "Generalisation is the extent to which one can come to conclusions about one thing based on information about another." There are two types of generalization – statistical and analytical.

Statistical generalization is applicable to quantitative surveys. The samples are usually a sub-set of the population. The issue is whether statistical analyses of the sample can be extrapolated to the whole population. This is a matter of sample size and the representativeness of the sample. These topics are covered in Section 8.2.1.

Analytical generalisation, for example as proposed by Yin (2013), concerns whether the empirical data from several replications (in this thesis, five institutions) converges on similar findings. Such analytical generalisation necessarily reflects the common features of the replicated institutions. To this extent, the findings may be generalizable to other institutions with similar common features. Thicker descriptions provide more scope for the comparison of features.

7.3.3 Risk management

Research involves two types of risk: 1) to the participants, ie ethical considerations; 2) to the research findings. The following two tables systematically consider the main risks under each of these two headings and how these risks have been managed.

Table 7.3 Risks to the participants

Main Risks	Description	Probability	Impact	Mitigating Procedures
That individual participants are harmed in the research process or by the subsequent divulgence of information	It is theoretically possible that participants in management research could be psychologically traumatised in the research process or could have their reputations tarnished by the divulgence of sensitive personal information.	The research is about institutions and not individuals. The subject matter is not controversial. Thus probability is very low.	Were it to happen, the impact could be serious	• The most important mitigating factor is that at no time will the research be aimed at collecting data about any named individual – the data will always be about an institution (including roles within an institution). • In the case of the survey, the covering letter will request that the questionnaire is completed by a member of the senior management team – who actually completes it will be anonymous to the researcher. • Survey results will be published in statistical form, except for summaries of free form data. Published findings will not be traceable to individual institutions. • At the start of each case study with each institution, the researcher will confirm confidentiality formally with the institutional representative. • Individuals participating in the case study interviews will be briefed beforehand and will be given the opportunity to review interview write-ups. • In the case studies, the names of institutions and interviewees will be known to the researcher. With regard to the publication of case study findings, individual institutions will be given aliases and any relevant contributions from individuals (eg quotations) will be assigned to numbered generic role descriptions. Any transcriptions will be suitably redacted. • It is possible that the case study may include information concerning confidential innovations, sensitive external relationships and internal cultural matters. The researcher has very substantial experience at the highest levels of handling the confidential data of private and public sector institutions, including universities and colleges of further education. Sensitive data will be disguised or omitted. • All data will be stored securely, and electronic data will be stored on a password protected computer. • Access to raw data will only be permitted to the researcher, supervisors and assessors. The researcher will discuss raw data only with the supervisors and assessors. • An audit trail will be maintained of processes and data.
That individual institutions are harmed by the divulgence of information	It is theoretically possible that information could be divulged by accident, incompetence or malice about an individual institution and that this leads to a loss of competitive advantage or the tarnishing of reputations or the souring of relationships.	The subject matter is not controversial. There is likely to be low visibility publication. Thus the probability is very low.	Were it to happen, it is unlikely that there would be serious harm	
That the reputation of the University of Surrey is tarnished	By a poor research process or by incompetent conduct by the researcher.	See above item.	Were it to happen, it is unlikely that there would be serious harm	

Contingency measures are not appropriate.

Source=Author

Table 7.4 Risks to the research findings

Main Risks	Description	Probability	Impact	Mitigating Procedures	Contingency Measures
That the survey has a low sample rate	Typical sample rates for surveys of this type range from 15% up to 35%, depending on their quality.	High	Limits statistical generalization from findings	• good questionnaire design • informative covering letter stressing relevance of research and ethical process • overall process uses best practice	Use of mixed methods – survey and case studies.
That survey results are inconclusive	The associations between the variables in the research model are not statistically significant.	Medium	Conclusions are less interesting than they otherwise would be	• careful choice of research questions • well specified research model • technical approach to operationalization of variables and specification of indicators • good questionnaire design	A failure of the expected associations is a result in itself, provided there is a feasible explanation.
That access to case studies is problematical	Permission to conduct interviews in a number of universities and FE colleges of further education is not granted.	Medium	Limits theoretical generalization from findings	• careful choice of institutions • informative briefing stressing relevance of research, ethical process and limited time required • covering letter visibly states support from the University of Surrey	Reduce number of institutions. Use of mixed methods – survey and case studies.
That case study results are inconclusive	Interesting and relevant themes do not emerge from case study interviews and document analysis.	Low/ Medium	Conclusions are less interesting than they otherwise would be	• careful choice of research questions • best practice techniques for interviewing • best practice techniques for data analysis • draw on researcher's extensive experience of conducting interviews	One would need to explain the results as best as one could. The research would not be invalid, but it may be less novel and interesting.
That the conclusions lack integrity	The conclusions are falsely drawn from the data.	Very Low	Invalidates the research	• rigorous processes clearly set out in the methodology • clear audit trails maintained • quality of supervision	Not appropriate

Source=Author

7.4 THE SURVEY

A questionnaire survey was developed based on the research objectives specified in Chapter Five – Research Specification. The questionnaire was sent to the whole populations of specified universities and FE colleges in the UK in the Spring of 2010. The results were analysed using statistical techniques. A copy of the questionnaire is included as Appendix B. This section covers choice of populations, questionnaire design and layout, operationalisation of research model concepts, demographic data, conduct of the survey and data analysis.

7.4.1 Choice of populations

In Chapter One - Introduction, it is explained why the setting for this research is universities and FE colleges in the UK. This sub-section explains how the specific populations of institutions were chosen.

There are several authoritative bodies who should have a reliable database of university institutions. The one chosen as a baseline was the Higher Education Statistics Agency (HESA), who are responsible for collecting, analysing and disseminating accurate and comprehensive statistical information with regard to UK higher education and who are necessarily in continual contact with all higher education institutions. Other lists of universities, including that of the Quality Assurance Agency, the then Department for Business Information and Skills and also various lists found on Wikipedia were used for verification and categorisation purposes. As a final check, the status of all universities was confirmed by accessing their individual web sites. The list of 133 universities used in this research is recorded in Appendix C.

Five categories of universities were excluded from the research population. Oxford and Cambridge and their constituent colleges were excluded because they are structurally very different from all other universities and would have had to have been analysed in their own separate statistical category. As they have very little in common with the comparator group of FE colleges, it was considered more relevant and simpler to exclude them from the analysis. For conceptual, statistical or practical reasons, other excluded categories include: specialist colleges eg music conservatoires and

agricultural colleges; private universities; universities from Northern Ireland; and universities with less than 1000 students.

The Learning and Skills Council, who at the time was the funding body for FE colleges, was unable to provide a database of FE colleges. However, the Association of Colleges (and sister bodies in Wales and Scotland) did provide a definitive list of all FE colleges in the UK. Other lists of colleges, including that of Ofsted and those found on Wikipedia, were used for verification and categorisation purposes. As a final check, the status of all FE colleges was confirmed by accessing their individual web sites. This brought to light several instances of colleges in the throes of merger. The list of 300 FE colleges used in the research is recorded in Appendix D.

Four categories of FE colleges were excluded from the research population. Colleges only consisting of a sixth form were excluded since their client base and general operation is very different from that found in the comparator group of universities. However, general FE colleges which include a sixth form college as part of their group, were included. For conceptual, statistical or practical reasons, other excluded categories include: specialist colleges, eg those for individuals with special needs; private colleges; and colleges in Northern Ireland.

7.4.2 Overall design and layout of the questionnaire

The overarching design criteria were: 1) to enhance the validity and reliability of the findings; 2) To ensure a high response rate; and 3) to ensure the survey was conducted according to high ethical standards. Textbooks by de Vaux (2013) and Bryman (2015) and the meta-analysis by Cook et al (2000) were consulted regarding the principles of questionnaire design. In order to achieve a successful outcome, attention to detail was considered important, as is illuminated in the following paragraphs.

In order to ensure that the respondent fully understood the nature and context of the research, the questionnaire package included a briefing letter and an introductory front page, which included a simple version of the research model, an outline of the questionnaire structure and some pointers regarding the focus of the research. In addition, clear instructions were given at the start of each page and each group of

questions. Where appropriate, definitions eg what is meant by strategic innovation, were given throughout the questionnaire.

It was ensured that the questionnaire would take no more than about 10-15 minutes to complete. As a result of trial and error, this worked out at about 10 pages. The first version of the questionnaire was twice as large as the final version. In order to shorten the questionnaire, concepts were prioritised, and some eliminated: sections were simplified; the number of items in indicator scales were reduced; and many stand-alone questions were omitted. The number of items in a scale is a trade-off between, on the one hand, wanting to include as many concepts as possible, and wanting to ensure those concepts are accurately represented, and, on the other hand, wanting to have a reasonably sized questionnaire. Nunnally & Bernstein's (1994) view is that having a single item scale or only a few items in a scale has several drawbacks. In this research, the two main composite variables – strategic innovative behaviour and collaborative behaviour – consist of 9 items and 39 items, respectively.

Care was exercised to ensure that the overall structure of the questionnaire flowed logically and that the spatial layout was pleasing to the eye. The wording of individual questions followed best practice and included ensuring that each question: was simple, clear and unambiguous; consisted of single concepts; was not leading; avoided unnecessary negatives; was relevant and interesting; and was likely to involve subject matter that would be within the recall of the responder.

Most questions in the questionnaire have 7-point Likert scales, usually involving the wording "strongly agree" through to "strongly disagree" (De Vaus, 2013). These were coded either 1 through 7 or 7 through 1, whichever made most sense. The Likert scale was chosen because it is the most widely used sample scale; met the statistical requirements of the survey; and proved popular with the participants in the pilot. In many instances, responses for individual items are aggregated to form a composite variable. The most powerful statistical techniques require continuous measures from low to high, where scale points are situated at equal distant intervals along the continuum. It is debateable whether the distance between say points 2 and 3 on a Likert scale are the same as the distance between say points 4 and 5 on a Likert scale.

However, if one looks at top quality journals, one will see widespread use of Likert scales for statistics requiring interval levels of measurement. Text books such as Blaikie (2003) and Sekaran & Bougie (2010) confirm that the practice is widespread. In accordance with the recommendations of Malhotra & Birks (2000) and Pallant (2010), multiple item Likert scales are treated as interval variables in this thesis. It is also worth emphasising that the responses are subjective and relative. They represent perceptions of respondents concerning the relative values of specific real world phenomena eg the degree of strategic innovation in their institution or the level of relationship building with a partner. Statistical aggregations of these response values have no absolute meaning and can only be analysed comparatively.

In addition to Likert style questions, there are also multiple choice questions, questions involving counts and several free form text questions. These free form questions provide useful data concerning contemporary innovation types which was useful in the analyses and in designing the subsequent case study.

The layout of the questionnaire has four sections, corresponding to the four components of the survey research model. Please see Table 7.5.

Table 7.5 Research model components mapped to questionnaire pages

Research model components	Page numbers in the questionnaire
Strategic Innovative Behaviour	2-4
Collaborative Behaviour	5-8
Organisational Learning/ Institutional Conforming	9
Control variables	10

Source=Author

7.4.3 Operationalisation of research model components

7.4.3.1 Introduction

The survey research model (Figure 5.1) is based on concepts developed in the Literature Review. The detailed operationalisation of these concepts is based on three

sources – the Community Innovation Survey (CIS) questionnaire, a preliminary research exercise and an exploration of measures in existing literature.

As a starting point, extensive use has been made of measures in the CIS questionnaire – a copy of which forms Appendix E. The CIS is a series of surveys conducted periodically by individual countries within the EU. The data from these surveys is used to produce the European Innovation Scoreboard and for academic research on innovation. At the time, the UK survey was sponsored by the Department of Business, Innovation and Skills and was distributed to over 20,000 enterprises. It is geared to commercial businesses rather than to public service institutions: nevertheless, the questionnaire (the 2006 version was available) has been a very useful input to this study's questionnaire design.

However, the scope of the survey in this thesis is much broader and deeper than the CIS and, therefore, other sources have been needed. Where possible, measures in existing literature have been utilised. In fact, although the subject matter of this research is rich in concepts and associated literature, many of the associated measures do not match the specific requirements of the survey model. The solution has been to derive new measures from combinations of existing measures or from a new operationalisation of concepts. However, in three important instances, there is no relevant literature at all. In these cases, a preliminary research exercise was carried out prior to the survey phase. This consisted of consultations with individual members of an ad hoc panel of expert tertiary education practitioners, which included senior FE college managers, university managers, FE college governors and university governors. Consultations with this panel were made in three specific areas: the types of contemporary innovation common in the UK TES, typical collaborative partners in the UK TES and the control factors most relevant to the UK TES. In the case of the first two areas, verification was sought by extensive analysis of university and FE college web sites.

Each of the four research model components is now considered in turn.

7.4.3.2 Strategic Innovative Behaviour (SIB)

This is the dependent variable. In the literature review, four important conceptual fundamentals for SIB are established. Firstly, it concerns organisational innovation and therefore the unit of analysis is an institution. Secondly, it consists of three innovation clusters – product/ service changes, process changes and organisational/ commercial changes. Thirdly, this research only includes strategic innovative change, defined as innovation that is discussed at senior management level. Fourthly, innovation need not be completely new, simply new to the institution.

For operationalisation, it is necessary to be able to measure the degree of SIB in an institution. In industrial enterprises, eg telecommunications companies, it has been found appropriate to use the number of patents or research and development expenditure as proxies for innovative activity. These are not appropriate measures for public service institutions. A more relevant approach is to measure actual innovation implementations. Damanpour (1987, 1996) and Moch & Morse (1977) argued that selecting just one specific innovation in an organisation might lead to bias so they recommend that a portfolio of innovations should be chosen and then one should count how many of each innovation has been implemented in each institution. However, there are weaknesses with Damanpour's approach. For example, all innovations are regarded as of equal importance; the implementation of any specific innovation is regarded as a simplistic yes/ no situation; and, from a practical point of view, the approach is very expensive and time consuming for a piece of PhD research.

This research has adopted a similar approach, but more refined and simpler. The approach still encapsulates Damanpour's aim of a comprehensive measure of innovativeness. The fundamental idea is that there is a domain of potential innovation opportunities for any institution within a sector: in this study, this domain is termed the "innovation space". This space is then broken down into sub-spaces of opportunities, ie individual innovation topics. Individual innovation implementations within sub-spaces are not counted as is the case with Damanpour: instead the degree of innovative change within that sub-space is assessed. Like most measures of innovativeness, it is

based on subjective assessment, but this assessment is systematic and comprehensive and within a well-defined innovation space.

The data model for SIB is shown in Figure 7.3. The innovation space for SIB consists of three clusters of innovation – Educational Services, Educational Delivery Processes and Business Organisation. These clusters are those identified in Section 2.2. Each cluster has its own full page in the questionnaire. In order to provide a finer grained variable, each innovation cluster is broken down into three innovation types. These innovation types were chosen by the expert panel of practitioners. Armbruster et al (2008) discuss several dimensions for what aspect of innovation to measure. Their suggestions are to measure the process or the utilisation or the outcome. In this research, for each of the three clusters, what is measured is the degree of importance of innovation change within the last three years within that institution. This is an outcome measure.

Three further data items are included in each innovation cluster page of the questionnaire. To emphasise the focus on outcome, for each innovation cluster there is a question that specifically asks whether the innovations in this cluster have been successfully implemented and whether they have achieved the expected benefits. In the subsequent question in each innovation cluster, participants are then asked to name which innovation had most transformed their institution's business performance. This is an open question. There are three reasons for asking this question. Firstly, it directly contributes to Research Objective 1 concerning the nature of innovation. Secondly, it identifies candidate innovations for the case study. Thirdly, how well participants answer free form questions, gives some indication as to how well they have understood the questionnaire and have taken the exercise seriously. The final question in each cluster is a multiple choice question directly related to Research Objective 10. Participants are asked who developed the concepts for the innovation cited in the free form question above – either mainly their institution or their institution in collaboration with others or mainly other institutions. This a very similar question to one in the CIS.

7.4.3.3 Collaborative Behaviour (CB)

This is the main independent variable in this research. In the literature review, two fundamental dimensions of CB are identified. Firstly, there is the type of collaborator and, secondly, for each collaborator type, there are several concepts related to collaborative activity. The data model for CB is shown in Figure 7.4.

In the literature review, the range and definition of collaborator types was found to be inconsistent and not well tailored to the UK TES. In these circumstances, the expert panel was consulted, and it was decided to focus on three prime collaborator types – educational service providers, government agencies and professional networking. The questionnaire consists of one page for each of these three main collaborator types (pages 6, 7 and 8) and also an additional page for what the author has called "spectrum of external relationships" (page 5). The expert panel had the view that the three prime collaborator types hide important sub-types and exclude other important collaborator types all together. Accordingly, it was decided to develop this "catch-all" spectrum.

For each of the three main collaborator types, there are two measures representing collaborative activity - relationship building, ie social capital, and collaborative working. The operationalisation of these concepts is as follows.

According to Nahapiet and Ghoshall (1998), social capital consists of three elements – network ties, trust and shared mind-sets. There are three existing scales which include all three elements of social capital – Tsai & Ghoshal (1998), Krause et al (2007) and Villena et al (2011); and four existing scales, which include just network ties and trust Parkhe (1993), Kale & Singh (2000), Yli-Renko et al (2001) and Landry et al (2002). In fact, the concept of a shared mind-set proved difficult in the pilot and this concept was omitted from the questionnaire.

With regard to network ties, the most common measure of tie strength is frequency of contact. This is used by Granovetter (1973), Marsden & Campbell (1984), Landry et al (2002), Reagans (2003), Kostova & Roth (2003) and Villena et al (2011). In addition, the range of contacts – levels and functions – is a useful additional measure of contact.

This is used by Parkhe (1993) and Villena et al (2011). These two measures are used in this research.

With regard to trust, in addition to the references above, there are also studies by Muthusamy & White (2005) and Chen (2004). Three aspects of trust are: working together to solve problems, specified by Kale & Singh (2000) and Mohr & Spekman; mutual adjustment, specified by Chen (2004); and reciprocity, specified by Kale & Singh (2000), Muthusamy & White (2005), Chen (2004) and Villena et al (2011). The first two of these measures are used in this research.

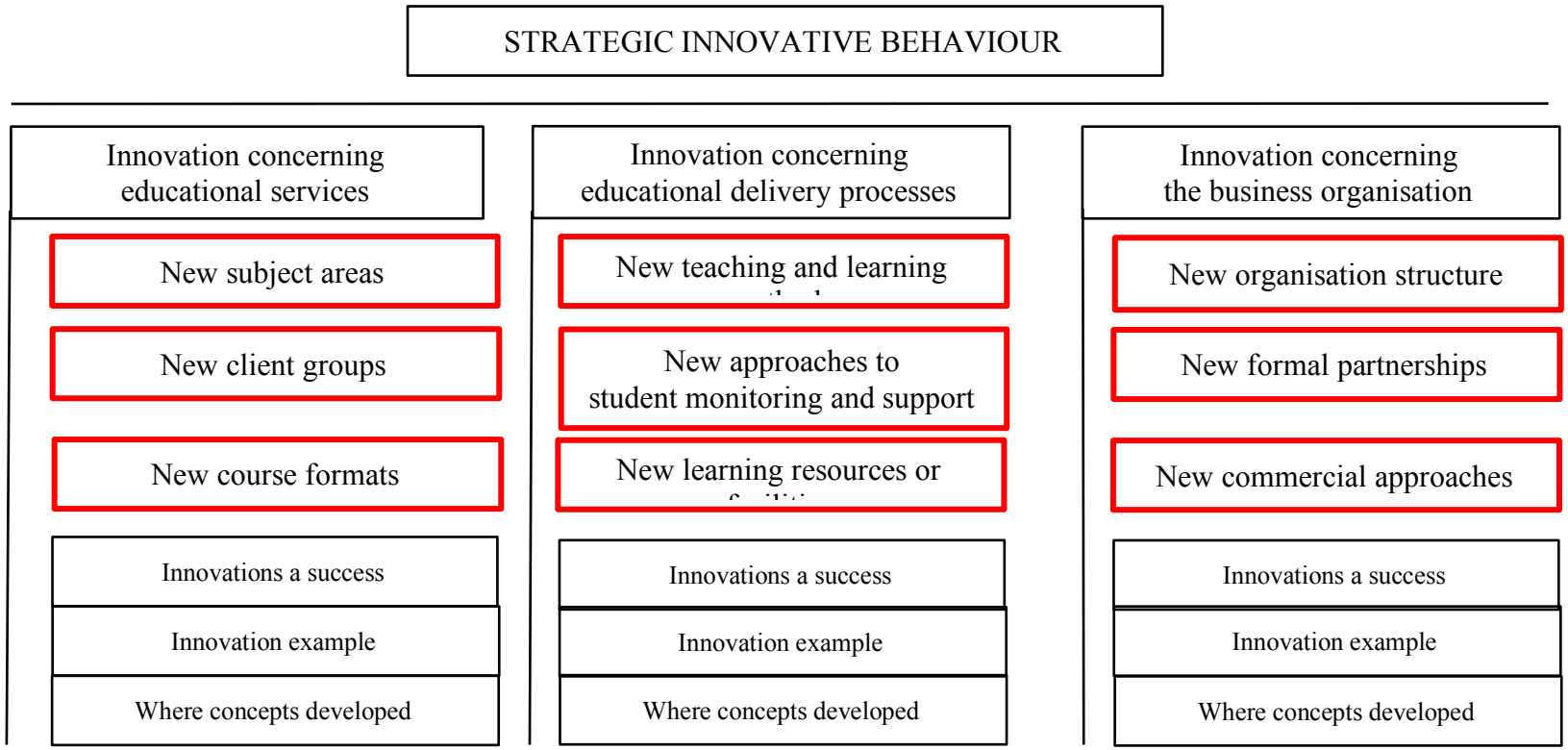
With regard to collaborative working, the literature is rather sparse. There are two types of collaborative working – one type specifically concerns innovative behaviour with activities such as knowledge transfer and collaboration on new developments – and the other type concerns operational working with activities such as sharing resources and the provision of joint services. Simonin (1999) has all four elements in his collaborative experience and collaborative know-how constructs and Muthusamy & White (2005) includes two items. All four measures are used in this research.

Thus, in all collaborative activity consists of four concepts - contact, trust, collaborative innovative activity and collaborative operational activity. Elements of these measures have been applied to construct the questionnaire items for each of the three prime collaborator types.

With regard to spectrum of collaborator types, the measures for collaborative activity are necessarily simpler than for the prime collaborator types. Contact consists of a multiple choice question concerning the frequency of formal dealings; collaborative activity consists of a yes/ no question concerning whether there is significant collaboration in innovation activities; and there is also a third question concerning whether the collaborator type is an important source of innovative ideas. This latter question mirrors a very similar question in the CIS and adds insight to Research Objective 10.

Finally, the panel thought that educational service providers is an important category and that the number of partners (Kostova & Roth, 2003) as well as the strength of any relationship is important. Accordingly, two devices were adopted in the questionnaire. Firstly, participants were asked for the number of educational partners they have – broken down into peer group partners and other educational service providers. Secondly, it was thought that asking for average values of, say, trust, across several educational partners is somewhat meaningless, hence the idea of a "strongest partnership" emerged for which such concepts would make more sense.

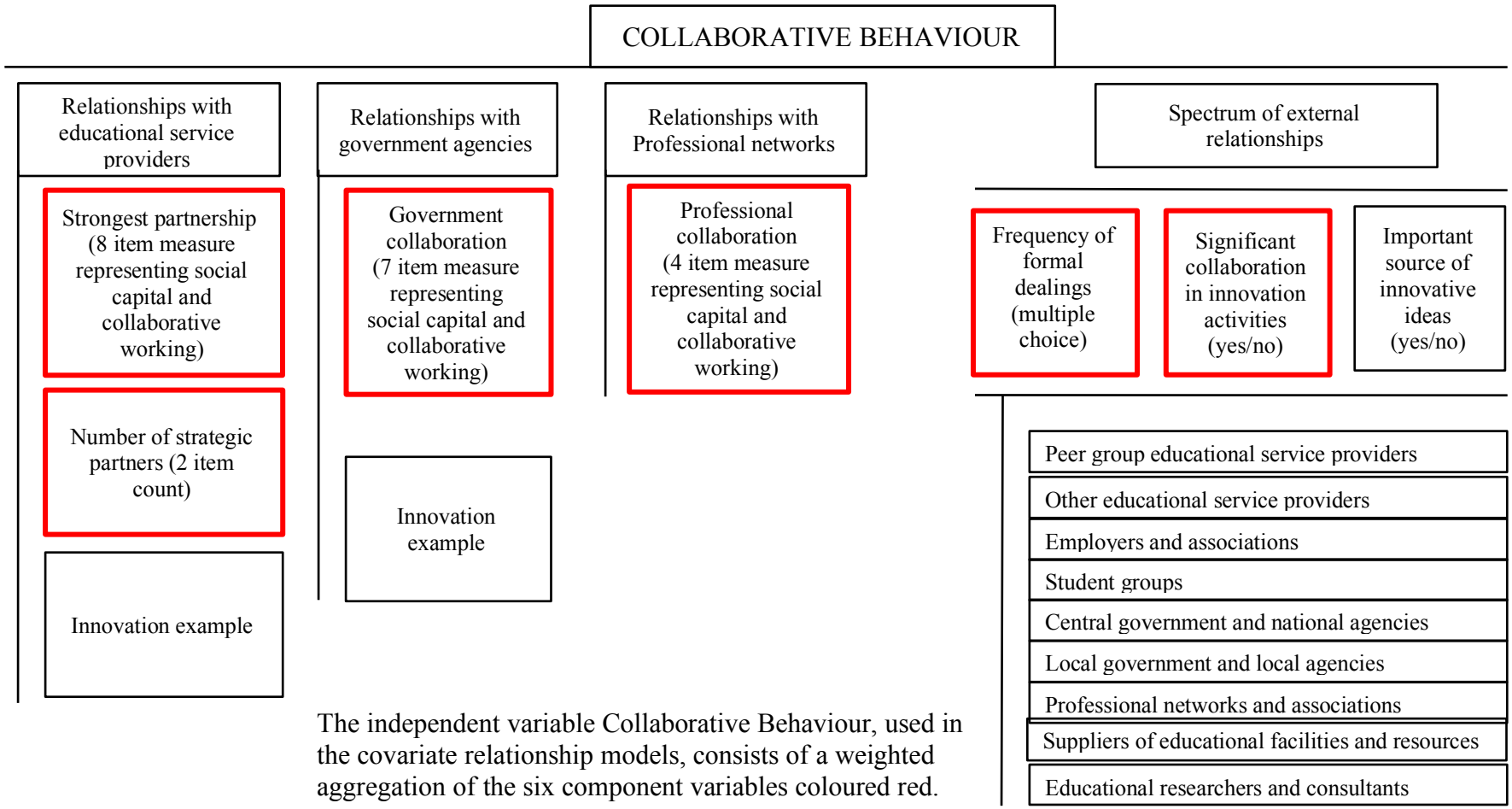
Figure 7.3 Data Model - Strategic Innovative Behaviour



The dependent variable SIB, used in the covariate relationship models, consists of an aggregation of the nine innovation types coloured red.

Source = Author

Figure 7.4 Data Model - Collaborative Behaviour



The independent variable Collaborative Behaviour, used in the covariate relationship models, consists of a weighted aggregation of the six component variables coloured red.

Source = Author

7.4.3.4 Organisational learning and institutional conforming

The second research question is whether organisational learning or institutional conforming is the greater influence on strategic innovative behaviour. This was exploratory, in that if the survey findings were to indicate that this is an interesting question, it would then be firmed up as a research question in its own right and be dealt with much more prominently in the case study. This turned out to be the case.

The main source for the measures for organisational learning and institutional conforming is the Literature Review Chapter 3 which explores the two theories in great depth. In Section 3.4, the two theories are summarised, and each of these summaries has been used to create a list of candidate concepts to include in the relevant measure, as shown in Tables 7.6 and 7.7.

Table 7.6 List of candidate concepts to include in an organisational learning measure

Seeking rational efficiency
Setting targets
Monitoring performance
Scanning the external environment
Experimenting
Sense making
Evaluating options
Integrating change
Open participation
Reflection on change

Source=Author

Table 7.7 List of candidate concepts to include in an institutional conforming measure

Seeking legitimacy
Adoption of common standards
Vulnerability to coercive pressures
Vulnerability to mimetic pressures
Vulnerability to normative pressures

Source=Author

Page 9 of the questionnaire concerns organisational learning and institutional conforming. Table 7.8 shows how the list of organisational learning concepts in Table 7.6 maps to the individual questions on Page 9 and Table 7.9 shows how the list of institutional conforming concepts in Table 7.7 maps to the individual questions on Page

9. These tables demonstrate that each key concept of both organisational learning and institutional conforming specified in the literature review is covered by a questionnaire item and that each questionnaire item, apart from Question 3, has a purpose related back to the literature review. Question 3 was based on the premise that much innovation derives from the juxtaposition of different ideas (Schumpeter, 1934; Nahapiet & Ghoshal, 1998). With hindsight, this question was redundant.

Table 7.8 Mapping of organisational learning concepts to questionnaire items

Key concepts from Table 7.7	Questions on Page 9 of the Questionnaire						
	1	2	3	4	5	6	7
Seeking rational efficiency	▯						
Setting targets	▯						
Monitoring performance				▯			
Scanning the external environment				▯			
Experimenting					▯		
Sense making						▯	
Evaluating options	▯	▯					
Integrating change		▯					
Open participation							▯
Reflection on change						▯	

Source=Author

Table 7.9 Mapping of institutional conforming concepts to questionnaire items

Key concepts from Table 7.8	Questions on Page 9 of the Questionnaire						
	1	2	3	8	9	10	11
Seeking legitimacy	▯	▯					
Adoption of common standards	▯	▯					
Vulnerable to coercive pressures							▯
Vulnerable to mimetic pressures				▯			
Vulnerable to normative pressures	▯	▯			▯	▯	

Source=Author

Having identified the main concepts, there was a subsequent trawl of the literature to identify existing scales and suitable questionnaire wording. Although organisational learning is a rich topic in the literature, many of the measures are oriented towards associated theories which are only partially in scope, such as the learning organisation, eg (Goh & Richards, 1997; Hung et al, 2011). Some of the more relevant of these measures are discussed below. These were used to devise the actual questions in the questionnaire.

Six existing constructs in part are useful in validating the scales used in this research. The construct of Chiva & Alegre (2008) consists of 14 items and covers five topics. Their experimentation topic matches Question 5 and their interaction with the external environment topic matches Question 4. However, the wording of their questions emphasise identifying the support for individuals rather than how the organisation actually behaves. The construct of Spicer and Sadler-Smith (2006) consists of nine items and covers two topics – experimentation and openness. These topics match Questions 5 and 7, respectively. Again their wording emphasizes the role of individuals, rather than a strategic perspective. The construct of Bontis et al (2002) consists of 24 items and covers five topics, most of which concern an organic structure or supportive culture and not key organisational learning features. Their topic on group level learning stocks matches Question 7, although their emphasis is on team-work. The construct of Sinkula et al (1997) consists of 11 items and covers three topics, two of which concern an organic structure or supportive culture and therefore not in scope, but the other topic concerns openness, and is related to Question 7, but only narrowly in terms of relationships with customers. The construct of Goh & Richards (1997) consists of 21 items and covers five topics, most of which cover an organic structure or supportive culture and therefore not in scope. One of their topics covers experimentation and matches Question 5. However, the emphasis is heavily on the role of individuals rather than strategic organisational behaviour. Finally, the construct of Jerez-Gomez et al (2005) consists of 16 items and covers four topics, three of which cover an organic structure or supportive culture and, partly in the case of one topic, knowledge transfer. Their topics cover openness and experimentation and match Questions 5 and 7, respectively.

It is worth making a general point about wording. Many questions in the literature are "apple pie" questions, ie intuitively one would expect only a positive response. For example, the question might ask whether employees are listened to, which is very unlikely to be answered negatively. However, if the question is whether staff are prepared to speak up about what works and what does not, then, a respondent might think about whether they always have done so in the past.

With regard to institutional conforming, there are somewhat fewer existing constructs. As Mizruchi & Fein (1999) found in their meta-analysis, many studies only look at one

or two of the three institutional pressures. Also, many studies are not based on a survey, but use data from records in the public domain, such as Ruef & Scott (1998) and Staw & Epstein (2000). Furthermore, as Teo et al (2003) found, many measures are too idiosyncratic for use.

However, several studies have used individual measures similar to the ones in this research. For example, studies by Haunschild & Miner (1997), Brandau (2013) and Colwell & Joshi (2013) include an item similar to Question 8 – following leading institutions; studies by Fennel & Alexander (1987), Westphal et al (1997), Haunschild & Miner (1997), Teo et al (2003), Roggenkamp et al (2005), Dahl & Hansen (2006), Liang et al (2007) and Kennedy & Fiss (2009) include an item similar to Question 9 – waiting until the majority have implemented an innovation; studies by Arndt & Bigelow (2000), Westphal et al (1997), Ruef & Scott (1998), Staw & Epstein (2000), Kennedy & Fiss (2009), Wang et al (2010) and Chandler et al (2013) include an item similar to Question 10 – heeding the views of stakeholders; and Giblin & Boruss (2009) include an item similar to Question 11 – heeding government pressures.

7.4.3.5 Organisational and environmental factors

This sub-section considers what organisational and environmental variables to include in the research and what measures to use for these variables. The final page, Page 10, of the questionnaire is reserved for these control variables. As this is not the dependent variable or one of the key independent variables, and in view of space limitations, any concept must be capable of expression in a very simple measure. Candidate controls are discussed and justified in Chapter 4. This section considers the choice of measures.

Institutional size

Income is Question 13 on page 9 of the questionnaire.

In the literature, the two most common measures are revenue and number of employees. Specific examples of revenue are Damanpour (1991) and Perez-Cano (2013) and specific examples of number of employees are Subramanian & Nilakanta (1996), Stock et al (2002) and Leal-Rodriguez et al (2015). Other types of measures

are sometimes used, for example capacity (Moch & Morse, 1977), which in tertiary education would equate with the number of students. Three meta analyses have been produced. Both Damanpour (1992, 2010) and Camison-Zanorza (2004) focus on revenue and number of employees but neither categorically states that one measure is better than the other. A further debate concerns whether to use a raw measure or a log transformation if there are decreasing returns to size as organisations become larger. Again, there is no firm advice from Damanpour (1992, 2010) or Camison-Zanorza (2004). As both revenue and number of employees are acceptable measures, the choice for this research was made on practical grounds. Annual income was chosen because any missing data could be filled in from institutional accounts available in the public domain. In order to compare universities against FE colleges, income was manipulated into four income categories.

Organic structure

Organic culture consists of Questions 4, 5 and 7 on page 9 of the questionnaire.

In the literature review, Burns & Stalker's (1961) organic culture concept encapsulates the structural/ cultural characteristics of an organisation that are conducive to innovative behaviour. The essence of this concept is identified in the literature review to include a shared vision, staff empowerment, cross-departmental networking and fluid multi-disciplinary teams. The scale chosen consists of the first three concepts. The fourth concept is omitted as it did not seem relevant to UK tertiary education organisations.

Leadership and innovation support

Transformational leadership combined with innovation support is the essence of the learning organisation concept. As the literature review discusses, this is a complex measure – and would need at least a page of its own. In view of space limitations and that this is a very well researched topic already, it was not included. However, elements of institutional support are covered in Questions 4, 5 and 7 on Page 9 of the questionnaire and the role of senior management in innovation and collaboration, respectively, are covered in Questions 6 and 9 on Page 9 of the questionnaire.

Professional workforce

This is covered by Question 8 on page 9 of the questionnaire.

This reflects the possibility that professional staff may resist changes to the status quo.

Environmental factors

These topics are covered by Questions 10, 11 and 12, respectively, on page 9 of the questionnaire.

Three items were chosen in consultation with the expert panel. There was a feeling that the rise of distance learning / MOOCS and advances in technology enhanced learning were a potential strain on the relatively stable TES. Hence, Question 10 concerns the rate of technological change. Regarding competition, waves of government cost cutting and the greater awareness by students of the performance of each institution, made sector competition feel a more urgent issue – and hence its inclusion as Question 11. Finally, the item regarding frequent government policy changes was suggested as being particularly relevant to FE colleges, but also increasingly to universities, and was included as Question 12.

Consistency checks

Questions 1,2 and 3 on Page 9 of the questionnaire.

The first three questions on the control page were intended to cross-check innovative intentions. Question 1 is a simple statement about whether an institution has increased its rate of innovation over the past three years, was highly scored by both universities and FE colleges and is strongly correlated with the strategic innovative behaviour measure. Therefore, this question performed its role as a check on consistency. However, the second and third questions had no influence on any key variable and,

with hindsight, it is apparent that these questions are too subtle, and it would have been better had they been omitted.

Textual questions and samples

The opportunity was taken of including some specific questions requiring a free form textual sample. These questions add to the richness of the survey. Five of these questions ask for examples of strategic innovation. Firstly, they provide one input into Research Objective 1, which concerns the nature of innovation in the sector. An analysis of the type of innovations cited by participants, and the comparisons between universities and FE colleges, is very illuminating and is presented in Section 8.3.4. Secondly, the samples enabled candidate innovations to be explored for input into the design of the case study. The other four questions have been much less useful, and their results are not presented in Chapter Eight - Survey Findings.

As well as their substantive benefits, free form questions also have process benefits. They relate directly to the real world and thus help participants to comprehend associated Likert style questions. They also enable participants to come up with ideas unconstrained by any pre-defined specification. Finally, the way these questions are completed indicates to some extent whether the participant has understood the questions and is taking the questionnaire seriously.

7.4.4 Demographic data

Each respondent institution is evaluated and coded in terms of five attributes derived from sources in the public domain. The purpose of this coding is: to assess whether the set of respondent institutions is representative of the total population of such institutions; to assist with the sensitivity analysis; and to provide spin-off analyses, interesting in their own right. The five attributes are: type of institution; geographical location; conurbation classification; quality characteristics; and income. These data are fully described and analysed in Section 8.2.1.2.

7.4.5 Conduct of the survey

The overarching criteria were: 1) to enhance the validity and reliability of the findings; 2) To ensure a high response rate; and 3) to ensure the survey was conducted according to high ethical standards. In order to achieve a successful outcome, attention to detail was considered important, as is illuminated in the following paragraphs.

7.4.5.1 Pre-distribution vetting

The questionnaire and planned administrative process were vetted by several advisors. The immediate PhD advisors included the researcher's main supervisor (a professor in the School of Management), secondary supervisor (the Head of the Department of Management) and the Director of the School of Management's PhD Programme. These three provided an initial check. A formal submission was then made successfully to the University of Surrey Ethics Committee.

Finally, the questionnaire was piloted with two representatives from the university sector (a deputy vice-chancellor and a university board member) and two representatives from the FE sector (both college principals). As well as being asked to complete the actual questionnaire, they were also asked to comment upon: whether the overall layout was well structured; whether there were any questions which were difficult to understand/ ambiguous/ not relevant/ potentially embarrassing to answer; specific questions eg the appropriateness of the nine innovation categories and spectrum of nine external players; whether there were any omissions; and how long the questionnaire took to complete. As a result of the feedback, changes were made to the spectrum of relationships page and to the relationships with educational service providers page. The average time to complete the questionnaire was satisfactory at 10-15 minutes.

7.4.5.2 Producing and distributing the questionnaire package

It was decided to distribute the questionnaire to the whole populations of 133 universities and 300 FE colleges. If one were to choose a sample, and then allow for

actual responses being inevitably much lower, one would very likely end up with a number of cases that was statistically problematical.

There are a number of choices for distributing a questionnaire. However, because of the size and geographical spread of the population, access to target individuals and the size of the questionnaire, the only feasible options in this instance were postal distribution and email distribution. At the time of the survey in 2010, postal addresses were much more easily available and more reliable than email addresses and, the post still had more of an aura of serious and formal intent than emails had at that time. Consequently, despite the cost, postal distribution was chosen. The whole package was designed to emphasise the formality and seriousness of the survey and to maximise the sample rate. Hence a good quality A4 envelope was chosen and personally stamped. Inside there was a reply envelope with a Freepost address. The outside envelope and the briefing letter was addressed to the named chief executive office together with their job title. In the briefing letter, the personal salutation and the signature were personally written and not printed. Ensuring up-to-date and correctly named and titled chief executive officers and correct addresses was an extensive exercise. In all 433 cases, these details were checked with/ obtained from the institution's web site and often follow-up phone calls were required to the actual institutions. The name of the institution was affixed to the front page of the questionnaire in order that receipt could be monitored.

The briefing letter was carefully designed to fit on one page and to include: the purpose of/ justification for the survey and why their participation would be important; clarity in what was expected from the respondent; how the results of the survey would be used; safeguards about anonymity and the ethical standards being adopted; and who to contact in the case of a query. A copy of the briefing letter introducing the survey to university/FE college chief executive officers is included as Appendix F.

Responses were checked off in the database. A follow-up process continued extensively for a three month period, until each institution had received at least one follow-up phone call. In the case of the many institutions that requested a duplicate survey or promised to return the survey by a specific date, further contact was made if a questionnaire was not received. In a handful of cases, the recipient contacted the author

directly for advice as to the meaning of specific questions. An audit trail of contact was maintained.

7.4.6 Data analysis

This section summarises the approach to data analysis. The detailed statistical theory and analysis is embedded in Chapter 8 – Survey Findings.

Questionnaire data was entered into SPSS. All entries were verified. Missing data were analysed and treated as described in Section 8.2.3. Specific variables were manipulated: designated questions were reverse coded; counts were transformed into category variables; and composite variables were developed. Demographic data was sourced and added to the database. Statistical analyses were conducted using SPSS and the results checked for reasonableness. Databases were routinely backed-up. Records of processing were maintained.

The careful design and execution of several processes assured a good design and the credibility of results, especially: the operationalisation of concepts – please see Section 7.4.3; attention to the response rate and the representativeness of the samples – please see Section 8.2.1; reliability and factor analysis – please see Section 8.2.2; and a sensitivity analysis of the results – please see Section 8.9.

Univariate and covariate analyses were used to address Research Objectives 1, 2, 3, 6 and 7. The theoretical basis for the univariate analyses is contained in Section 8.3.2 and the theoretical basis for the covariate analyses is contained in Section 8.4.1. A path model – please see Section 8.6 - and multivariate analyses – please see Section 8.7 - were used to address Research Objective 9. Research Objective 10 was addressed using simple % tabular analysis.

7.5 THE CASE STUDY

Stake (1995) describes two types of case study: the intrinsic case study focusses on the uniqueness of a particular case; the instrumental case study, usually with more than one case, provides insight into a substantive issue or theory. The case study in this

research is of the latter type. There is no specific interest in the selected five institutions or indeed the 31 specific innovations studied. They are merely vehicles to explore the two research questions.

7.5.1 Case study design

7.5.1.1 Selection of institutions

The structure of the case study is what Yin (2011, 2013) calls a multiple embedded case design. There are two layers of analysis. The primary and top layer is the institution, ie the case. Below that there is the secondary layer which is a specific innovation space. Yin (2011, 2013) says there are two options for the configuration of multiple cases. Having two contrasting types of institution – such as universities and FE colleges as in this research – is what Yin (2011, 2013) calls theoretical replication. Having more than one of each type is what Yin (2011, 2013) calls literal replication, because one would expect similar results. This is akin to repeating an experiment and gives an added assurance to the credibility of the results. In this research, there are three universities and two FE colleges. An alternative design might have been to have an additional theoretical replication instead of the literal one, with one institution being strongly innovative or collaborative than the other. This was rejected for practical reasons – such characteristics would have been difficult to predict in advance; and for theoretical reasons, it was felt more would be learned from institutions with positive characteristics.

Access to institutions in order to conduct case studies is always a potential problem. In this instance, it made sense to select from those institutions who had responded to the survey questionnaire. They could well be willing candidates and, because of the questionnaire responses, several important attributes would be known about them which would not be known about other institutions.

Institutions with specific characteristics were targeted, in what Stake (1995), Silverman (2014) and Bryman (2015) call a purposeful selection. The focus was on universities and FE colleges which have a reputation for quality and innovativeness, since it was thought that more successful institutions would be more illuminating. Secondly, as FE

colleges are generalist institutions with a focus on widening participation, vocational education and value added, it made sense to select universities with a similar focus. This does limit the generalisation of the results but, on the other hand, it makes for a clearer focus and for more meaningful comparisons. Thirdly, as universities are generally larger than FE colleges, only the larger FE colleges were considered for selection. Finally, there was an aim to have institutions from different parts of the country. Originally, this meant, for each type of institution, one from the north, one from the midlands and one from the south. This was achieved for universities but for FE colleges, gaining access to an institution in the south proved difficult. After looking carefully at the data and preliminary findings, it was decided that the data was sufficiently robust and saturated, and it was decided that five institutions, ie 20 interviews, was sufficient for the research and no further FE colleges in the south were approached. The sources used in selecting the institutions included the results of the previous survey, Ofsted reports, Guardian value added tables, government statistics on widening participation and institutional web sites/ published documents.

7.5.1.2 Selection of innovations

The vehicle for analysis in each institution was strategic innovations. It would be impractical to cover every innovation and it was reasoned that if the most important, say, seven or eight innovations were selected in each institution, then that would cover a representative range of innovations and circumstances. Multiply that by the five institutions, gives a broad range of up to 40 innovations. In order to provide a systematic approach, it was decided to focus 50% of the study on strategic innovations of a general nature and 50% of the study on specific innovation spaces. For the specific innovation spaces, employer engagement and technology enhanced learning were chosen. These were derived by analysing the free form results from the survey. The criteria for selecting a specific innovation was: that it is a big issue for both universities and for FE colleges; that it is a current issue, as opposed to one that is past or is one for the future; and that there is an overall balance of service and process innovations.

The following nine innovations were identified from the survey textual samples.

Table 7.10 Analysis of candidate innovations for the case study

Innovations involving changes to…..	Big issue for universities	Big issue for FE Colleges	Past, current or future issue	Innovation cluster
Curriculum portfolio	✓	✓	Always	Service
Mode of course delivery	×	×	Future	Service & Process
Quality assurance	✓	✓	Always	Process
Technology enhanced learning	✓	✓	Current	Process
Personalisation of courses	×	✓	Future	Process
Widening participation	✓	✓	Always	Mainly service
Employer engagement	✓	✓	Current	Service & process
International ventures	✓	×	Current	Service & process
Structural re-organisation	✓	✓	Always	Business

Source=Author

Technology enhanced learning and employer engagement were chosen as the two innovation spaces for the case study. They satisfy the criteria, were both very prominent in the survey textual samples and both are rich in content.

7.5.1.3 Selection of enquiry methods and data sources

Detailed data was needed concerning historical institutional behaviour, especially decision making, in respect of strategic innovation and collaboration. This information is most likely to be in people's heads and unlikely to be in document form, at least not comprehensively or conveniently. Therefore, interviews with senior managers were chosen as the primary method of enquiry, although where relevant and where available, documentary evidence would be collected as corroboratory evidence.

7.5.1.4 Selection of interviewees for each institution

In order to have a comprehensive spread of innovations and of different perspectives, it was decided to have four interviews in each institution – two interviews would focus on strategic innovations of a general nature, one would focus on employer engagement and one would focus on technology enhanced learning. Individual interviewees were chosen by the delegated organiser in each institution, with advisory input from the

Author. The resultant list of interviewees was excellent for the research. There were some fears that interviewees would be chosen at a relatively low management level – this fear was completely unjustified. The roles of the interviewees are described in Section 9.1 of the Case Study Findings chapter.

The configuration of institutions, innovation spaces and interviewee roles, made it possible to look for patterns in the data across these dimensions and this made for a richer analysis.

7.5.2 Organisation and conduct of the interviews

The success criteria were: 1) to ensure participation by appropriate institutions and by appropriate interviewees; and 2) to ensure that interviews were efficient and effective by ensuring that interviewees understood what was expected of them and by focussing questions on the research objectives. In order to achieve a successful outcome, attention to detail was considered important, as is illuminated in the following paragraphs.

A letter was sent to the vice-chancellor/ principal requesting the participation of their institution in the research. This letter included: the purpose of the research, how it was being approached, what would be involved in the participation, ethical considerations and next steps. A copy of the briefing letter introducing the case study to university/FE college chief executive officers is included as Appendix G. The letter suggested delegation of the organisation of the interviews to a member of the senior management team and this is what happened – universities delegating to a pro vice-chancellor and FE colleges to the deputy principal. Negotiations then took place regarding who the interviewees should be and the logistical arrangements for the interviews. This process was quite protracted, and, in fact, from the moment the letters were first sent out to the date of the final interview was nearly 12 months.

A copy of the original letter to the vice-chancellor/ principal and an interview briefing note was sent to each participant just before each interview. A semi-structured interview was conducted on the lines indicated in 7.5.3 below. The format for each interview consisted broadly of the following: short introductory briefing; discussion of

candidate innovations; in depth discussion of the innovation journey for each innovation; wrap up. The interview was allowed to flow if what the interviewee was saying was interesting and relevant, provided all key aspects were covered at some point. Periodically, summaries were given by the interviewer to the interviewee so as to assure understanding. A voice recording device was used with the interviewee's permission.

After each series of interviews at each institution, the vice-chancellor/ principal was thanked for their institution's participation. After the data analysis was complete, an edited transcription was sent to each participant as a matter of courtesy. Participants were not expected to reply unless there was a problem with the transcription. About half replied with thanks for the transcription – no problems were raised.

7.5.3 Designing the interview questions

This is a key process and is as important as the operationalisation of variables in the survey. The aim is to use the case study research model framework in order to design interview questions that should produce sufficient data to answer the research objectives specific to the case study.

According to the case study research model (Figure 5.2), a series of specific innovations within specific institutions was to be used as the vehicle for the analysis. For each selected innovation, a model implementation cycle is explored. This is called the innovation journey in this research and consists of initiation, development and exploitation stages. The model innovation journey is developed in Section 2.3. The case study research model sets out three topics to be explored within the innovation journey. The first topic concerns evidence for collaborative activity, who with and why. Background theory to this topic is provided in the literature review and, more importantly, relevant statistical material is provided by the findings in the survey. The second topic concerns the role of key internal organisational factors, such as the organisational culture and style of leadership and again, background material is in the literature review. The third topic concerns evidence for an organisational learning or institutional conforming style in the innovation journey. In this regard, detailed

guidelines were developed in Section 5.2.2 which specify the differing behavioural characteristics of each style mapped against each stage of the innovation journey.

The interview questions followed a pattern as follows.

Interviewees were chosen to speak to a specific range of innovation types. In two interviews in each institution, the choice could be of any innovations that the interviewee considered strategically important to the institution. In the other two interviews in each institution, the choice of innovation needed to be related to employer engagement or technology enhanced learning, respectively. It was suggested to interviewees that they should pick the most significant three innovations with which they were familiar. Each interview slot was scheduled to be one hour. In most cases, due to the preliminary briefing letter, interviewees already had their choice of innovations ready. Some time was spent fully understanding the nature, history and purpose of the selected innovations. However, 75% of the interview time was spent on the innovation journey – where questions were clustered according to the three stages – initiation, development and exploitation.

The initiation stage had two basic interview questions. Firstly, what triggered the innovation? For example, was it business need or external pressure, systematic search or serendipity, senior management or departmental staff driven? Secondly, what were the criteria for making the adoption decision? For example, was there a business case, were there considerations of cost benefit analysis, alignment with business strategy, competitive advantage or imitation, government pressure or funding inducements, reputation with stakeholders, a perceived need to follow sector norms or simply CEO whim?

Next, the questions concerned how the innovation had been developed. For example, was it adequately planned and resourced, was consideration given to the re-design of externally sourced innovations, was the organisation given a re-fit and the staff appropriately re-trained, were external partnerships considered and were trials conducted?

Finally, the questions concerned exploitation. For example, what was the extent of infusion, ie depth of utilisation, what was the extent of diffusion, ie spread between departments and staff; were there pilots, was the innovation integrated into all existing systems, had there been reflection on what had worked and what had not, eg a post-implementation review, had thought been given to sustainability and continuous update, had the benefits been realized – implying the benefits were measurable and were part of the initial justification?

Finally, questions were asked concerning the level and contribution of internal consultation and external collaboration in respect of each of the above events/ decisions? What had been the form of consultation/ collaboration, who had it been between, had it been influential? Had internal consultation been participation? Had external collaboration been one/two way knowledge transfer or had there been joint operational working? This was rather a contingency question, as the topic had normally been covered fully during discussion of the innovation journey itself.

This may appear to be a very structured interview. In fact, while it was assured that all interviews covered all the relevant questions at some point, the actual sequence of coverage did not follow a pattern and depended on how the interviewee chose to answer the questions. Interviews were allowed to flow freely if they had something interesting and relevant to say and often topics were covered without a specific question needing to be asked. The plausibility of claimed innovation successes were probed, sometimes seeking corroboratory documentary evidence. The time slot for each interview was one hour and, typically, an enormous amount of material was covered. Interviews were necessarily intense. A measure of the appropriateness of the interview questions and actual interviews is that not once during the subsequent data analysis did the question arise as to "Why wasn't so and so asked during the interviews?" One of the reasons for the success of the interviews was the seniority, enthusiasm and know-how of the interviewees.

7.5.4 Data analysis

The aim of qualitative data analysis is to convert the data in the 20 interviews into a chapter in the thesis that answers the research questions and research objectives. A

common approach is thematic analysis. Braun & Clarke (2006) define this as "a method for identifying, analysing and reporting patterns (themes) within data" (p.79) and continue that "a theme captures something important about the data in relation to the research question" (p.2). The basis of thematic analysis is the coding of data. Many writers have proposed their own specific techniques for this process. For example: Miles & Huberman have a rather mechanistic approach, with extensive use of tabular presentations; Strauss & Corbin (1998) adopt a prescriptive process of open coding, axial coding into categories and selective coding of core categories and their relationships; Charmaz (2002) uses a simpler approach based on detailed initial coding and consolidation into focussed codes; while Braun & Clarke (2006) suggest that thematic analysis, and the associated coding, is a flexible approach to be moulded to the specific research circumstances. Braun & Clarke (2006) suggest a six step guideline process as set out in Table 7.11 and this will be used as a framework to compare the steps actually used in this thesis.

Table 7.11 Phases of thematic analysis

Phase	Process
1. Familiarisation	Transcribe data; read and re-read data, noting ideas
2. Generate initial codes	Code interesting features of the data systematically across whole data set; collate data relevant to each code
3. Search for themes	Collate codes into relevant themes
4. Review themes	Review whether whole system of themes works
5. Define themes	Refine themes and the whole storyline
6. Produce report	Produce scholarly report, relating to the research question and include vivid data extracts

Each of these tasks was completed in this thesis. However, phases 2 and 3 were much more complex and iterative than is suggested above and, in fact, included phases 4 and 5 simultaneously. Phase 6 was also more complex than suggested above. A summary description of the process used in this research follows below.

The interviews were fully transcribed. The 20 interviews resulted in 160,000 words. It was decided to use Dragon software, which is able to produce reasonably accurate transcriptions from a trained voice. However, considerable subsequent editing was required to ensure accuracy, to check for sense, to delineate voices and add some rudimentary punctuation.

In the next phase, each transcript was broken down into discrete chunks of text, each chunk representing a single idea. Strauss & Corbin (1998) suggest each chunk should be a line or paragraph, but it made sense for the chunk to be logically based rather than literally based. Each chunk says something about one or, quite frequently, several topics, and codes representing each relevant topic were applied to each chunk. The specification of codes was both a top down deductive process and a bottom up inductive process (Braun & Clarke, 2006; Simons, 2009). The deductive codes were based on the research objectives. In effect, they were high level categories that the case study chapter had to say something about – specifically innovations, collaborators, stages of the innovation journey and innovation justification criteria. The inductive codes were the sub-codes under each of these high level categories and these emerged during the analysis. For example, the specific collaborator types were sub-codes generated from those relationships mentioned by the interviewees. In addition, some high level codes emerged that were not envisaged – specifically leadership and organisational co-ordinating mechanisms. Finally, each chunk of data was coded with two basic attribute codes – the institution and the interviewee. This enabled, inter alia, vivid quotations to be embedded in the chapter.

The next phase was for the data to be sorted. Several sorts were prepared, reflecting the key sections in the case study chapter, eg nature of innovation, influence of collaboration and organisational learning versus institutional conforming. Individual chunks were sorted according to each of the codes to which they belonged. For example, all the collaboration chunks were sorted by the collaborator type sub-codes and this formed the basis for the collaboration section of the Case Study chapter. To construct the narrative, the chunks had to be sequenced into a logical storyline and text composed. Furthermore, to demonstrate patterns and relationships in the collaboration data, analytical tables were generated. This required the further coding and sorting of the chunks of collaboration data - for example Table 9.4 consists of chunks sorted by collaborator type and functional role – the latter being a further emergent sub-code. A similar process was carried out for each major section of the Case Study chapter.

Due to the scale and complexity of the data, this analysis process was painstakingly thorough, highly iterative and involved many checks for consistency and soundness. This included pattern matching and testing of rival explanations. Facilities in MS

Word were used to manipulate the data. It had been hoped to use NVIVO, but perhaps that software is more appropriate for large projects than for sorting chunks of data into complex overlapping hierarchies. To give two examples of the scale of analysis: one of the phases of the innovation journey that emerged was "reflection" and this applied to 100 individual chunks of data; and one of the criteria for the justification of an innovation was legitimacy/ reputation and this applied to 48 chunks of data. One example of an interviewee transcript and resulting thematic coding is presented in Appendix H. This has been redacted to preserve anonymity.

7.6 Chapter summary

This chapter has discussed research philosophy and research design options and justified a critical realist approach and a mixed methods design involving a quantitative survey followed by a qualitative case study. The variables were operationalised for the survey and the conduct and analysis of the survey was presented. The approach to the selection of case study institutions and innovations was explained, the interview questions were specified, and the conduct and analysis of the case study was presented.

CHAPTER EIGHT

SURVEY FINDINGS

8.1 INTRODUCTION

8.1.1 Research objectives

This chapter presents the survey findings, the focus of which are the research objectives. The research objectives and research models are developed in Chapter Five – Research Specification. The research objectives specific to the survey are shown below.

1 To explore the nature of strategic innovative behaviour.

2 To identify whether collaborative behaviour influences strategic innovative behaviour.

3 To identify whether collaborator type differentially influences strategic innovative behaviour.

6 To identify whether organisational learning or institutional conforming influences strategic innovative behaviour more.

7 To identify whether organisational learning or institutional conforming influences collaborative behaviour more.

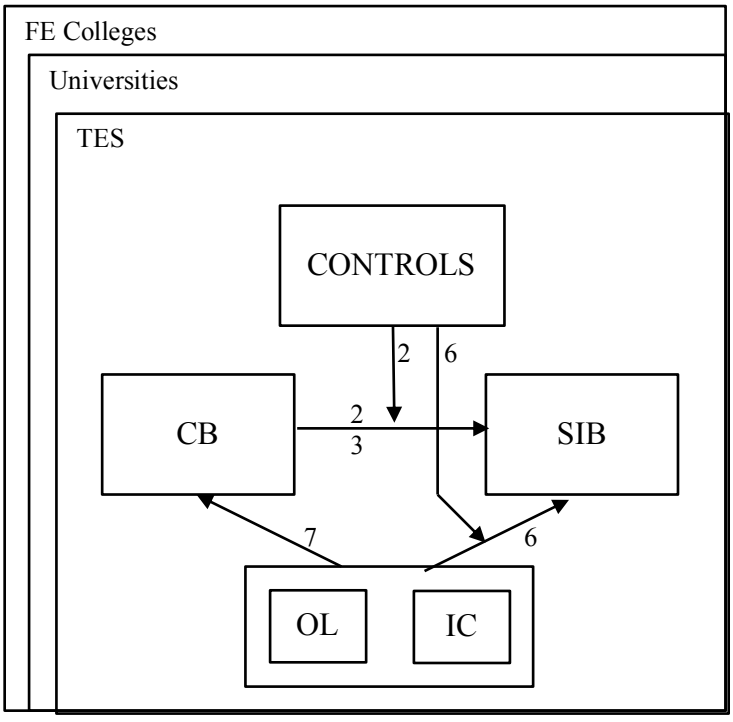
9 Using the results from Research Objectives 2 and 6, to develop a statistical model that identifies the relative contribution made by the key independent variables in influencing strategic innovative behaviour.

10 To examine where is external collaboration positioned in the development of concepts for innovation, compared with mainly internally generated sources and mainly externally generated sources

8.1.2 Survey research model

The following model represents Research Objectives 2, 3, 6 and 7. A more detailed survey model is developed in Section 5.2.1 of the Research Specification chapter.

Figure 8.1 Model of Research Objectives 2,3,6 and 7



SIB= strategic innovative behaviour; CB= collaborative behaviour;
OL= organisational learning; IC= institutional conforming
Source=Author

8.1.3 Chapter contents

Section 8.2 is concerned with demonstrating the credibility of the findings. It considers the response rate and whether demographic characteristics indicate that the voluntary sample is representative of the whole population of UK universities and further education FE colleges. It then considers the reliability of the measurement of each variable using Cronbach's Alpha. Finally, it explains the treatment of missing data values in the questionnaire response.

Section 8.3 considers the findings with regard to RO1 – the nature of strategic innovative behaviour – by analysing the responses to both Likert and free form responses concerning different innovation types. This RO is considered in much richer detail in the case study.

Section 8.4 considers the findings with regard to RO2 – which concern the primary research topic concerning the relationship between collaborative behaviour and strategic innovative behaviour; and RO3, which explores which type of collaborator has the greatest influence over strategic innovative behaviour. The analysis compares the results for universities and FE colleges and checks whether the results hold for different contingencies. The data analysis uses univariate and covariate statistics.

Section 8.5 considers the findings with regard to RO6, concerning whether organisational learning or organisational conforming has more influence over strategic innovative behaviour and collaborative behaviour, respectively.

Sections 8.6 and 8.7 develop the statistical model for strategic innovative behaviour required by RO9. Section 8.6 develops a correlation matrix and a path model and Section 8.7 develops multivariate analyses, the latter having separate models in respect of the whole sample and for universities and further education colleges, respectively. The results are interpreted and summarised.

Section 8.8 briefly considers a statistical analysis of RO10 – the positioning of collaborative behaviour as a source of innovative concepts compared with mainly

internally and mainly externally generated ideas, respectively. This RO is also considered in the case study.

Section 8.9 subjects the key findings to a sensitivity analysis based on five university/ FE college attributes.

Finally, section 8.10 provides a summary of the key findings.

8.2 CREDIBILITY OF THE FINDINGS

This section explores the data with regard to the following questions:

i) Can the sample be generalised to the whole population?

ii) Are the scales reliable indicators of the concepts they are designed to measure?

iii) Are missing values in the questionnaire responses a problem?

Relevant statistical theory and checks for statistical assumptions are embedded throughout the chapter.

8.2.1 Generalisation

The question is whether statistics based on the sample research data can be generalised to the whole population There are two checks that can be made – the size of the response rate and the representativeness of the sample.

8.2.1.1 Response rate

All things being equal, the higher the response rate, the greater the accuracy of any statistical generalisation. The following table compares the sample counts against the population sizes for FE colleges and universities.

Table 8.1 Sample size as % of population and the response rate

	Sample		Population		Response Rate
Type of institution ↓	Count	% of total sample	Count	% of total population	%
FE Colleges	102	64.6	300	64.7	34.0
Universities	56	35.4	133	35.3	42.1
Total	158	100	433	100	36.5

Source: fieldwork counts matched against HESA and AoC statistics

The overall response rate is 36.5%. The separate response rate for universities is 42.1% and for FE colleges it is 34.0%. Is this a good response rate? SurveyGizmo is an enterprise level data collection platform supporting businesses in conducting marketing surveys. They estimate that the typical response rate for external surveys is 10-15% (SurveyGizmo, 2017). On the other hand, a meta-analysis of over 100 organisational related research studies published in top refereed management journals in 2000 and 2005, found an average organisational response rate of 35.7% (Baruch & Holtom, 2008). On this evidence, the response rate for this research is at least satisfactory. Inputting the response rate into the Raosoft sample size calculator, gives 95% confidence that the whole sample results would have a 6% margin of error. However, this assumes a random sample. In fact, the sample is a volunteered sample of the whole population and might be subject to selection bias by the researcher and/ or the participants (McLennan, 1999; McLeod, 2014). The solution is to demonstrate that the demographic profile of the sample is representative of the whole population (McLennan, 1999; McLeod, 2014). This is the purpose of the next section.

8.2.1.2 How representative is the sample?

The demographic profile of the sample is matched against the demographic profile of the population. The demographic profile is based upon six institutional characteristics:

the ratio of FE college institutions to university institutions, institutional categorisation, geographical location, conurbation classification, quality assessment and income. Table 8.1 shows the % of the total sample made up of FE colleges and universities, respectively, is 64.6 and 35.4. The actual population %s are 64.7 and 35.3. This is a very close match.

In the remaining demographic analyses, the component samples, for universities and further education colleges, respectively, are treated separately.

Institutional categorisation

A common approach for universities is to base a categorisation on waves of university formation – each wave being associated with a period of time. The categorisation of such waves used in this research is: pre-1960; post-1960; post-1992; post-2000; and university college (ie not yet having been awarded full university status).

Table 8.2 University categories – sample versus population

University categorisation	% of sample	% of population
Pre-1960	24.1	25.6
Post-1960	18.5	16.5
Post-1992	24.1	28.6
Post 2000	22.2	19.5
University College	11.1	9.8

Source: sample= fieldwork; population= individual university web sites

Applying the chi-squared test, there is a 94% likelihood that the sample is not independent of the population. In other words, there is a very strong chance that the university sample can be generalised to the university population.

With regard to FE colleges, there is no similar historical basis for categorisation. However, there is a self-styled elite grouping called the '157' group, and this has been used for this analysis.

Table 8.3 FE college categories – sample versus population

FE college grouping	% of sample	% of population
In '157' group	14.8	12.1
Not in '157' group	85.2	87.9

Source: sample= fieldwork; population= 157 web site

Visual inspection shows the profiles to be well matched.

Geographical location

For the purposes of this research, Universities and FE colleges are categorised as either being based in England or being based in another part of the UK, ie Wales, Scotland or Northern Ireland. The following table compares the sample with the population.

Table 8.4 Geographical locations – sample versus population

Type of institution ↓	Sample		Population	
	% in England	% in rest of UK	% in England	% in rest of UK
Universities	81.8	18.2	78.9	21.1
FE Colleges	72.3	27.7	79.7	20.3

Source: sample= fieldwork; population= HESA and AoC statistics

On visual inspection, the profiles of the samples against the populations are a close match.

Conurbation classification

An educational institution in a large conurbation is likely to face very different issues than one in a stand-alone town or rural community. This is especially true of FE colleges as these are typically community colleges. In conurbations, there are likely to be more students in the category "widening participation" and there is likely to be more local competition from other colleges and other private educational providers for students, staff and funding. For the purposes of this exercise, the five largest conurbations in the UK, with populations over one million, have been identified and any FE college within any of the towns making up one of those conurbations has been classified as an institution within a conurbation. The five conurbations are, in order of size: London, Manchester, West Midlands, West Yorkshire and Glasgow. Using this

definition, 26% of the FE sample is classified as conurbation colleges compared with 22% of the population of FE colleges. This is a very close match.

Table 8.5 Conurbation demographics for FE colleges

	% of sample		% of population	
	Classified as a conurbation	Not classified as a conurbation	Classified as a conurbation	Not classified as a conurbation
FE colleges	26	74	22	78

Source = ONS 2011 census

The sample and population profiles for FE colleges are very close.

Quality assessment

At the time of collecting this data, there was not a recent official grade for teaching and learning for universities. However, there were several independent assessments. The Guardian assess universities i) on an overall score, which includes elements that indicate how attractive a university is for students and ii) on value added. Using data published in 2010, the median score on these two measures is used for comparison.

Table 8.6 Quality assessment demographics – universities – sample versus population

The Guardian university grading ↓	Range	Median of sample	Median of population
Guardian overall score	1-100	58	57
Guardian added value score	0.1-10.0	5.4	5.6

Source: field work and Guardian value added tables

The sample and population median scores for the two Guardian measures are well matched.

All FE colleges are graded periodically by OFSTED as either Outstanding, Good, Satisfactory or Inadequate. Unfortunately, the length of the inspection cycle and changes in inspection policy over time makes profile matching difficult. A profile of inspection results for only 2007/8 has been matched – this includes only 22 of the sample of 101 FE colleges.

Table 8.7 Quality assessment demographics – FE colleges – sample versus population

Ofsted FE college grading	% of sample with OFSTED category	% of population with OFSTED category
Outstanding	41	32
Good	27	39
Satisfactory	32	22
Inadequate	0	7

Source: field work and Ofsted reports

A visual inspection shows the sample to have a reasonable spread, given the difficulties in matching.

College income

Size is the most commonly used control parameter in surveys of organisations. The survey asked respondents to state their institution's income. From this data, scales containing four income categories were developed and these are used as controls in the correlation analyses and in the sensitivity analysis.

Table 8.8 Annual Income – sample versus population

	Mean annual income in sample £M	Mean annual income in population £M
FE colleges	24	23
Universities	160	160-200

Source: AoC 2011 and Universities UK 2011

The mean annual income in the population has been derived by dividing the total sector income by the total sector population, separately for universities and FE colleges. As shown in Appendix A, during the period of the survey, total university income was £26.8B and total FE college income was £6.8B. The target population of universities for this research was 133, although this omitted several universities for technical reasons, and the actual number was 165. The target population of FE colleges for this research was 300.

It can be seen that the sample mean income and the actual mean income for both universities and FE colleges is well matched.

Conclusion

The sample is a close match against both the university and FE populations in respect of the six demographic indicators. This gives confidence in the representativeness of the sample data.

8.2.2 Reliability

There are two facets of reliability – test/ re-test and internal consistency. This section is concerned with the latter, which measures the degree to which the items in a scale hang together as an overall concept. The indicator that is most commonly used to measure this is Cronbach's alpha. This measures the average correlation among all items that make up a scale. Its value can be between 0.0 and 1.0. According to George & Mallery (2003), values can be assessed as follows: > 0.9 = excellent; > 0.8 = good; > 0.7 = acceptable; > 0.6 = questionable; > 0.5 = poor; < 0.5 = unacceptable. One might question the rating of > 0.9 as excellent. With such a high average correlation among items, one might wish to examine whether the items are too similar. Pallant (2010) says that where scales contain less than 10 items, alpha values are often inherently low. In such instances, a score > 0.5 is acceptable. Briggs & Cheek (1986) recommend assessing the inter-item correlation for the items, the optimal range for which is 0.2 to 0.4. These guidelines have been adopted in this research.

Most scales used in this research have been derived deductively. However, factor analysis has been used to obtain scales for "organisational learning" and "institutional conforming" using all the items in the innovation processing page and following Pallant's (2010) steps.

Innovation indicators

The most important indicator of innovation in this research is strategic innovative behaviour. This is a construct of three clusters, each of three innovation types, making nine innovation types in all. Table 8.9 shows the results for this indicator for the whole

sample and for the two constituent samples of universities and FE colleges. All three samples are satisfactory, as each Cronbach's Alpha is above 0.7.

Table 8.9 Reliability statistics for the SIB construct

Sample	Number of items in construct	Cronbach's Alpha
Whole sample	9	.821
Universities	9	.840
FE colleges	9	.768

Source=fieldwork/SPSS

Drilling down, Table 8.10 shows that the reliability statistics for each innovation cluster are satisfactory, as Cronbach's Alpha is above 0.7 for each cluster.

Table 8.10 Reliability statistics for each innovation cluster

Innovation Clusters	Number of items in each scale	Cronbach's Alpha
Changes to Educational Services/ Client groups	3	.750
Changes to Educational Delivery Processes	3	.715
Changes to Business Organisation	3	.718

Source=fieldwork/SPSS

Another indicator of innovation is whether it is deemed to have been successful. Table 8.11 shows that Cronbach's Alpha is below 0.7. However, as there are only three items in this indicator and as Cronbach's Alpha is above 0.5 with a mean item correlation between 0.2 and 0.4, this is satisfactory.

Table 8.11 Reliability statistics for innovations success scale

Innovation Scales/ items	Number of items in scale	Cronbach's Alpha	Mean Inter-Item Correlation
Innovations have been successful	3	.614	0.35

Source=fieldwork/SPSS

Collaboration indicators

The most important indicator in this group is collaborative behaviour. This is a construct of the separate collaborator type indicators. Table 8.12 shows the results for this indicator for the whole sample and for the two constituent samples of universities

and FE colleges. All three samples are satisfactory, as in each case, Cronbach's Alpha is above 0.7.

Table 8.12 Reliability statistics for the CB construct

Sample	Number of items in construct	Cronbach's Alpha
Whole sample	39	.858
Universities	39	.883
FE colleges	39	.839

Source=fieldwork/SPSS

Collaborative behaviour includes scales for three main collaborator types: viz. strongest educational partner, government agencies and professional networking, respectively. Table 8.13 shows that the results for each of these scales is satisfactory, as in each case, Cronbach's Alpha is above 0.7.

Table 8.13 Reliability statistics for three main collaborator type scales

Relationship Scales/ items	Number of items in scale	Cronbach's Alpha
Strongest educational partner	8	.872
Government agencies	7	.871
Professional networking	4	.840

Source=fieldwork/SPSS

Organisational Learning and Institutional Conforming Indicators

These indicators have 11 items in all – 3 items are joint, 4 items are specific to organisational learning and 4 items are specific to institutional conforming. Table 8.14 shows that the Cronbach Alpha for these two indicators is not satisfactory.

Table 8.14 Reliability statistics for the original OL and IC scales

Indicators	Number of items in scale	Cronbach's Alpha	Mean inter-item correlation
Organisational learning	7	.344	.08
Institutional conforming	7	.517	.13

Source=fieldwork/SPSS

Consequently, a factor analysis is conducted using all 11 items, in order to see whether two better indicators could be derived. The 11 items were subjected to a principal

components analysis. The suitability of the data for factor analysis was assessed. Inspection of the correlation matrix showed that many coefficients are 0.3 and above. The Kaiser-Meyer-Olkin value is .765, which exceeds the recommended value of 0.6: and Bartlett's test of sphericity reached statistical significance, supporting the factorability of the correlation matrix. Although the principal components analysis revealed the presence of three components with eigenvalues exceeding 1.0, an inspection of the scree plot showed a clear break between the second and third component. Thus a two component solution was confirmed. This explains a total of 44.5% of the variance, with component 1 contributing 27.8% and component 2 contributing 16.7%. An oblimin rotation was performed to aid interpretation.

Table 8.15 shows the pattern and structure matrix for the principal components analysis with oblimin rotation of the two component solution using the 11 innovation processing items.

Examining the items making up the two components shows that they are a strong logical fit for organisational learning and institutional conforming, respectively. Five items loaded strongly on component 1, organisational learning, with values above 0.6. Four items loaded strongly on component 2, the institutional conforming indicator, with values above 0.6. Three items were dropped: two items had values below 0.6 for both components and one item – "follow innovative behaviour of leading institutions' - did not fit conceptually with the component for which its value was over 0.6. Conceptually, with regard to institutional conforming, this means that while the coercive and normative institutional pressures are substantiated, a mimetic pressure has not been.

Table 8.15 OL and IC factor analysis

Item	Pattern coefficients		Structure coefficients		Communalities
	C1	C2	C1	C2	
Items including in learning indicator					
Continuously experimenting with new ways of doing things	.798	.211	.762	.076	.624
Staff prepared to speak up about what works and what doesn't	.691	-.217	.728	-.334	.575
Constantly scanning environment for opportunities	.680	-.185	.712	-.301	.540
Routinely conduct post implementation reviews of significant organisational change	.658	-.203	.692	-.315	.519
Items included in conforming indicator					
Only adopt standard innovations or conduct comprehensive evaluation	.029	.696	-.090	.691	.478
Only consider an innovation after it has been successfully implemented by the majority	.084	.660	-.029	.646	.424
Many innovations are only adopted because they improve chances of meeting government standards or of obtaining government funding	-.006	.622	-.112	.623	.388
Only implement standard designs or test alternative designs for fit	-.276	.610	-.380	.657	.505
Items dropped					
Follow innovative behaviour of leading institutions	.618	.405	.549	.300	.461
Expectation of stakeholders is important when making innovation decisions	.347	-.068	.359	-.127	.133
Strategic innovations are based on a single idea or juxtaposition of many ideas	-.128	.459	-.206	.480	.247

C1 = Component 1; C2 = Component 2. Source=fieldwork/SPSS

Table 8.16 shows the revised reliability statistics, which are now satisfactory.

Table 8.16 Reliability statistics for the revised OL and IC scales

Innovation Decision Making scales/ items	Number of items in scale	Cronbach's Alpha	Mean inter-item correlation
Organisational learning	4	.748	.44
Institutional conforming	4	.626	.30

Source=fieldwork/SPSS

Organic culture indicator

Table 8.17 shows that the reliability statistics for this indicator are satisfactory.

Table 8.17 Reliability statistics for the organic culture scale

Scale/ items	Number of items in scale	Cronbach's Alpha	Mean inter-item correlation
Organic culture	3	.526	.28

Source=fieldwork/SPSS

Conclusion

All scales used in the quantitative analysis satisfactorily met the requirements for reliability.

8.2.3 Missing values and their treatment

Missing values in the sample data may result in a loss of statistical power and/or introduce bias (De Vaus, 2013). This sub-section identifies the extent of missing values in the survey sample and explains how such data has been treated.

Two responses are anonymous – one university and one FE college. It was not possible to use these samples in any analysis which requires demographic data from the public domain.

There are three reasons why respondents omitted to complete part of a questionnaire. Six respondents could not identify a "strongest partner" and therefore did not complete page 5 of the questionnaire. In addition, four respondents had difficulties in interpreting parts of the questionnaire and therefore did not complete two whole pages of the questionnaire plus a number of individual items. Finally, three respondents inadvertently missed out completing four whole pages of the questionnaire plus a number of individual items. Note that a few respondents had multiple of the above three problems. To put the missing data into perspective, there are 158 responses and the questionnaire has nine pages of data. 1410 out of 1422 possible pages have been completed, ie 99.2%. Regarding the additional individual items of data that were omitted, this accounted for only 73 items out of a possible 9551, ie a completion % of 99.2%. In fact the completion % for the important Likert variables, of which there are 55 items per questionnaire, was 99.8%.

By far the most serious problem was that in nine of the 158 cases, for a variety of reasons, there was no data for the section relating to the strongest partner. As some of the responses represented a genuine null value, no attempt was made to insert any imputed average data for the strongest data section of any of these eight samples. Consequently, these eight cases are missing from any statistical result requiring strongest partnership data. With regard to other missing data, it has been replaced with average values calculated from FE college data or university data, as appropriate.

With regard to free form textual data, the response rate, apart from whole missing pages, was 97% in respect of the compulsory data and 48% in respect of the optional data.

Conclusion

Missing values in the responses, and their treatment, were noted, prior to the quantitative analysis.

8.3 THE NATURE OF STRATEGIC INNOVATIVE BEHAVIOUR

8.3.1 Introduction

This section addresses the first research objective.

RO1: To explore the nature of strategic innovative behaviour.

RO1 is an introductory context setting research objective and leads on to the theoretically more important RO2 and RO3. RO1 is met by three specific findings. Finding 1 (8.3.2) is a univariate statistical analysis of the perception of the overall importance of strategic innovative behaviour and a comparison between the perceived importance of different types of innovation. Finding 2 (8.3.3) is a univariate statistical analysis of the perception of the success of implemented innovations. Finding 3 (8.3.4) is an analysis of free form responses to requests for examples of strategic innovation.

8.3.2 Finding 1 – The perceived overall importance of strategic innovative behaviour and the perceived comparative importance of different innovation types

Finding 1 is derived from Likert style questions specifically concerning the degree of importance of strategic innovative behaviour within an institution – strategic behaviour being defined as important enough to be discussed formally by the senior management team. This question is asked in respect of three clusters of innovation types i) changes to the curriculum or client groups; ii) changes to teaching and learning methods; and iii) changes to business organisation. Each of these three clusters of innovation types is, in turn, sub-divided into three innovation sub-types. Thus, there are nine separate questions, each considering the importance of a specific type of innovation. For each of the nine questions, a 7-point Likert scale is used. Had this question been the core of the research, rigorous benchmarks would have been provided for respondents to position their institution reliably at the appropriate Likert point for each innovation type. In the circumstances, the samples depended on the respondents' respective interpretation of "degree of importance of strategic innovative behaviour within their institution". However, given a 7-point Likert scale with a mid-point of 4, it is reasonable to assess that mean scores of, say, between 5 and 6, would indicate a

positive impression of the importance of innovation within their institution. A method of determining whether a sample mean is statistically significantly different from a given point is provided by the one-sample t-test. This test has been applied to all university and FE college mean scores and compared with the mid-point value of 4.0. In each relevant table, a university or FE college mean which is statistically different from this mid-point value is annotated *. In fact, only two variables (both in Table 8.23) involve means which are not statistically different, which means all other variables are statistically different from the mid-point. The four assumptions required for this test are: being an interval variable, independent observations, no significant outliers and an approximately normal distribution apply (please also see the next paragraph).

The university and FE college samples are compared for significant differences using the independent samples t-test. Two assumptions for this test are i) that the dependent variable is interval and ii) that the respective distributions are normal. It is customary to treat multiple item Likert scales as an interval variable (Malhotra & Birks, 2000; Pallant, 2010). Accordingly, in this research, the independent samples t-test is used for constructs of three items or more, otherwise the Mann Whitney test is used (and the results annotated †). With regard to the second assumption, a visual inspection of the histogram for the variable is the best approach to testing for normality. In respect of this research data, the distribution for all variables, except for a very few, approximated to the shape of the normal bell curve, indicating normality. There is a third assumption, that the variances are homogeneous. This is not a show stopper, as using Levene's test, it just requires one to read a different line in the SPSS results. For both single item variables and multiple item constructs, the 2-tailed significance level is presented. Following Stevens (2012), values of 0.01 or less are highlighted as this indicates that there is a significant difference in the mean scores for each of the two samples. Where there is a significant difference, the value of eta squared is calculated according to Pallant (2010) and interpreted according to Cohen (1988, 1992).

Table 8.18 sets out the statistical means in respect of the degree of importance of strategic innovative behaviour within tertiary educational institutions.

Table 8.18 Importance of SIB by innovation cluster – univariate analysis

Innovation cluster	Whole sample mean	University mean	FE college mean	U v FE significant t-test
All innovations	5.2	5.0*	5.3*	NS
Changes to the curriculum or client groups	5.2	5.1*	5.2*	NS
Changes to teaching and learning methods	5.4	5.3*	5.4*	NS
Changes to the business organisation	5.1	4.8*	5.3*	0.016

*mean is significantly different from 4.0
Source=fieldwork/SPSS

The mean for the whole sample is 5.2 and the range of means for each breakdown of innovation cluster by University and FE college samples is between 4.8 and 5.3. The values indicate a positive impression of the importance of innovation across all innovation clusters and in respect of both universities and FE colleges. The mean university scores are all below the mean FE college scores. The final column in Table 8.18 shows the results of conducting an independent samples t-test, using the significant (2-tailed) t-test for equality of means. According to Pallant (2010), a value equal to or less than 0.05 shows there is a significant difference in the mean scores of the two groups. In this case, a significant difference is found for the innovation cluster "Changes to the business organisation". Drilling down into the constituent innovation types for this innovation cluster, illuminates two significant differences and these are shown in Table 8.19.

Table 8.19 Importance of SIB – changes to business organisation innovation cluster – univariate analysis

Innovation cluster	Whole sample mean	University mean	FE college mean	U v FE significant t-test
Changes to business organisation	5.1	4.8	5.3	0.016
Organisational or leadership changes	5.0	4.8	5.1	NS
New partnerships	5.2	4.9	5.4	0.041†
Commercial changes	5.0	4.6	5.3	0.004†

†Man Whitney test
One-sample t-test not applied
Source=fieldwork/SPSS

Using the Man Whitney test, the medians for 'New partnerships' and 'Commercial changes' are significantly higher for FE colleges compared with universities. With regard to the former, no explanation is offered. However, in the latter case, this

provides supporting evidence for the narrative that FE colleges are relatively tightly funded compared with universities and that FE colleges have, in recent years, been directed to adopt a more commercial approach and to seek to provide full cost recovery courses. In fact, it is the university mean for commercial changes that is the anomaly, as it is below the university mean for all other innovation types. This suggests that at the time of the survey, for universities, a commercial approach may have been less of a focus than other types of innovative change.

8.3.3 Finding 2 – The perceived success of strategic innovations

As well as scoring the degree of importance of each innovation type, respondents were asked to score whether their institution's innovations had been successfully implemented and had achieved the expected benefits. A 7-point Likert question was asked in respect of each of the three innovation clusters. The overall sample mean is 5.6 and the means for universities and FE colleges is 5.5 and 5.6, respectively. According to the one-sample t-test, the university and FE college means are significantly different from 4.0 and according to the independent samples t-test, there is no significant difference between the university and FE college means. Clearly, both type of institutions have a high impression of the success of their strategic innovative behaviour

8.3.4 Finding 3 - Examples of strategic innovations

In addition to Likert type questions, the questionnaire has several free form questions. Five of these free form questions specifically ask respondents to cite significant examples of innovation within their institution. These samples provide additional evidence concerning the types of innovation conducted. Three free form questions specifically cover the three innovation clusters, respectively, ie changes to curriculum or client groups, changes to teaching and learning methods and changes to business organisation. The other two free form questions concern examples of strategic innovation with educational partners and government agencies, respectively. The following table depicts a summary of the key findings from the responses.

Table 8.20 Summary of textual examples of strategic innovation

Category of innovation examples	Universities	FE colleges
Curriculum/ client changes	Over 80% of responses concerned curriculum changes – less than 20% client changes	35% of responses concerned curriculum changes and 65% concerned new clients – 45% being employer related
Teaching and learning changes	75% of responses concerned technology enhanced learning	45% of responses concerned technology enhanced learning and the remainder included miscellaneous quality improvements
Business organisation changes	50% of responses concerned organisational/ leadership changes and 25% concerned international ventures	50% of responses concerned organisational/ leadership changes and 40% concerned new partnerships (mainly with universities and employers)
With educational partners	40% of responses concerned new curriculum changes and 30% concerned the development of new centres	60% of responses concerned new curriculum changes only 10% concerned new facilities
With government agencies	50% of responses concerned new curriculum changes	25% of responses concerned new curriculum changes and 35% concerned resources

Source=fieldwork

The first comment to make is that the research design decision to break the overall innovation space into the three specific clusters of curriculum/ client group changes, teaching and learning changes and business organisation changes proved sound and effective. It was well understood by respondents and all cited innovations fitted well into one or other innovation cluster. Secondly, and not surprisingly, by far the greatest innovative change by both universities and FE colleges concerned major changes to the curriculum – although this covered a wide variety of subject matter and motivation. The case study explores this aspect in much richer detail. Thirdly, the topic of employer engagement stands out, most overtly in the 45% of responses of FE colleges under the curriculum/ client changes innovation cluster. However, examples are also cited in some form or another under all five headings, by both universities and FE colleges. This accords with the statistical analysis in the next section, concerning the

importance of employers as a collaborator type in respect of innovative behaviour. Finally, technology enhanced learning stands out under the changes in teaching and learning methods – being related to 75% of university responses and 45% of FE college responses. The answers to these free form questions give a good picture of what universities and FE colleges considered strategic innovation at the time of the survey.

8.4 THE RELATIONSHIP BETWEEN COLLABORATIVE BEHAVIOUR AND STRATEGIC INNOVATIVE BEHAVIOUR

8.4.1 Introduction

The primary topic of this research is the relationship (CB $\Rightarrow$ SIB) between collaborative behaviour (CB) and strategic innovative behaviour (SIB). This topic is addressed in the quantitative survey by two research objectives:

RO2: To identify whether collaborative behaviour influences strategic innovative behaviour.
and
RO3: To examine whether collaborator type differentially influences strategic innovative behaviour.

For the purposes of statistical correlation analysis, a composite variable called strategic innovative behaviour (SIB) has been specified (please see Section 7.4.3.2). This is a construct of the nine measures for the individual innovation types. Similarly, a composite variable called collaborative behaviour (CB) has been specified (please see 7.4.3.3). This is a construct of the measures for the main collaborator types, ie strongest educational partner, government agencies and professional networking; and two of the spectrum collaborator indicators, ie formal dealings and significant collaboration in innovation activities. Each of these CB variables is weighted in inverse proportion to their respective means, in respect of the whole sample. This ensures that each measure has an equal impact.

RO2 is met by three specific findings. Finding 4 (8.4.2) is a statistical correlation showing the overall relationship between CB and SIB. Finding 5 (8.4.3) tests whether this overall relationship holds for each type of innovation. Finding 6 (8.4.4) tests whether this overall relationship holds for each control variable.

RO3 is met by five specific findings. Finding 7 (8.4.5) is a univariate statistical analysis of the perceived importance of the three main collaborator types. Finding 8 (8.4.6) is a univariate statistical analysis of the perceived importance of the nine spectrum collaborator types. Finding 9 (8.4.7) is a statistical correlation of the relationship between each of the three main collaborator types and SIB. Finding 10 (8.4.8) is a statistical correlation of the relationship between each of the nine spectrum collaborator types and SIB. Finding 11 (8.4.9) is an overall assessment of Findings 7 through 10 to arrive at a ranking of which collaborator type has the greatest influence on SIB.

Correlation statistics describe the strength and direction of linear relationships between two variables. The Pearson product-moment correlation coefficient (r) is appropriate for interval variables and in this regard multiple item Likert scales are considered interval variables (Malhotra & Birks, 2000; Pallant, 2010). Accordingly, in this research, Pearson's r is used for Likert scales consisting of three or more items, otherwise Spearman rho is used (and the results annotated †). Values for r can vary between 0.0 and 1.0. Cohen's (1988, 1992) rules of thumb have been used to interpret a value as follows: < 0.3 = low; 0.3 to 0.5 = moderate; > 0.5 = high. The significance level is a measure of how much confidence one should have in the results. It is heavily dependent on the sample size and is not as important a statistic as the coefficient. A test is made to identify whether there is a significant difference between the correlation coefficients for the university and FE college samples, respectively. This is calculated according to Pallant (2010). The descriptive statistics and histograms for each variable and the scatterplots for each pair of variables were examined, as appropriate, for signs of linearity, outliers, restricted range of scores, normality of scores and homoscedasticity. In these regards, there is no problem with any individual variable or pair of variables which are the subject of correlation analyses in this section.

8.4.2 Finding 4 - Correlation between CB and SIB

Figure 8.2 – Model showing the relationship CB ⇨SIB

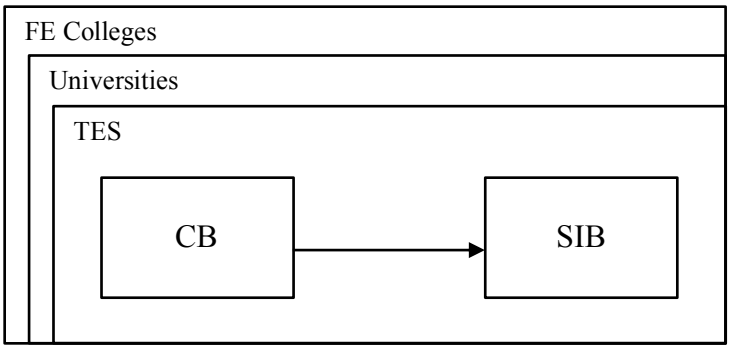


Table 8.21 sets out the overall relationship between the two main variables, CB and SIB.

Table 8.21 Correlation between CB and SIB

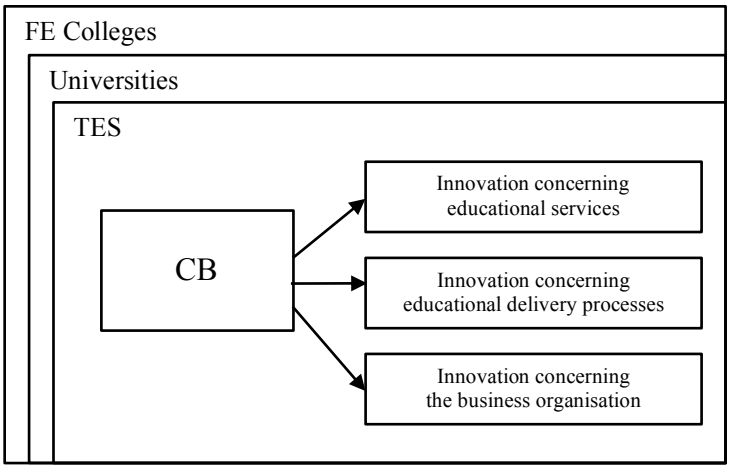
Whole sample r	Universities r	FE colleges r
.36***	.45***	.37***

†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

These results demonstrate that there is a moderate, positive and significant relationship between CB and SIB in respect of the whole sample and the separate university and FE college samples. This relationship is at the heart of this research and to find such a positive association is an important result.

8.4.3 Finding 5 - Correlation between CB and SIB – by innovation cluster

Figure 8.3 – Model showing the relationship CB ⇨SIB, by innovation cluster



Having established that there is a positive and significant relationship between CB and SIB, the first test is whether this holds for each of the three innovation clusters. This is set out in Table 8.22.

Table 8.22 Correlation between CB and the three innovation clusters that constitute SIB.

Innovation cluster	Whole sample r	Universities r	FE colleges r
Curriculum/ client changes	.246**	.244†	.277**
Teaching and learning changes	.370***	.430***	.370***
Business organisation changes	.255***	.381***	.254**

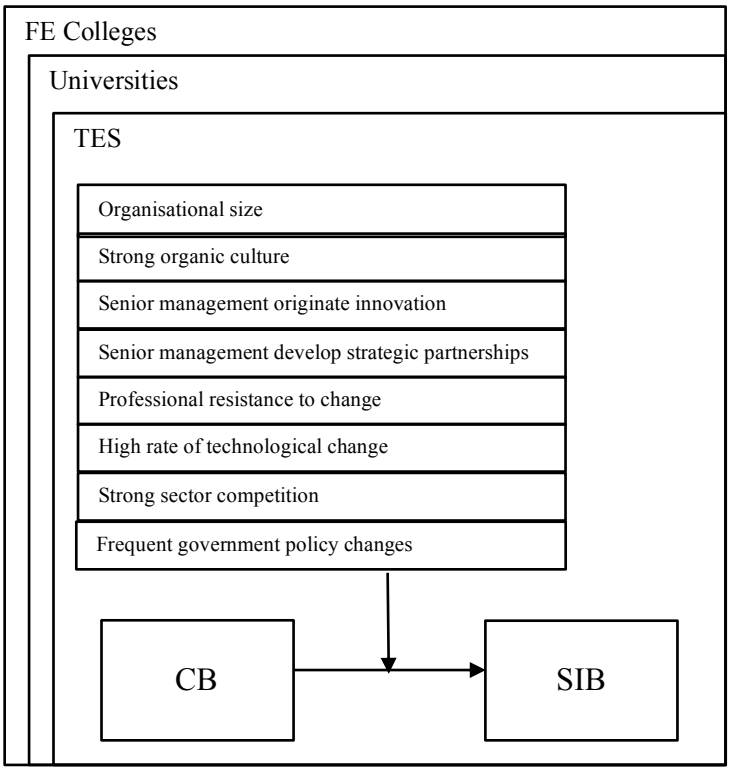
†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

The significant relationship holds between collaborative behaviour and all three innovation clusters, although it is strongest for teaching and learning changes. One possible reason is that collaborative activity may be more focussed in this area, since it may be that curriculum/ client changes and business organisation changes are regarded

as somewhat competitor sensitive, whereas teaching and learning methods is regarded as a collegiate topic.

8.4.4 Finding 6 - correlation between CB and SIB – allowing for organisational and environmental factors

Figure 8.4 – Model showing the relationship CB ⇨SIB, by controls



In the first instance, we will examine the perceived importance of each control variable using univariate statistics.

Table 8.23 Univariate statistics for the organisational and environmental control variables

Control variable	Universities	FE colleges	t-test
Strong organic culture	4.5*	4.6*	0.521
Senior management originates most strategic innovation	4.3	3.9	NS†
Senior management plays dominant role in strategic partnerships	5.1*	5.4*	NS†
Professional resistance to change	3.6*	3.6*	NS†
High rate of technological change	3.7	3.7	NS†
Strong sector competition	5.7*	5.5*	NS†
Frequent government policy changes	5.1*	6.2*	0.000†

*means are significantly different from 4.0
†Man Whitney test
Source=fieldwork/SPSS

There are four notable findings. Firstly, and not surprisingly, there is a perception by both universities and FE colleges that senior management play a dominant role in strategic partnerships. Interestingly, this does not apply to their originating strategic innovation. Secondly, there is the perception by both universities and FE colleges that the competition in their respective sectors is strong. Thirdly, the responses to frequent government policy changes is interesting. While the university value is quite high, the FE college value is extremely high. The difference between the university and FE college means are significant, using the independent samples t-test. This accords with other evidence in the survey. For example, within the final free form questions, there were several comments from FE college respondents concerning the burdensome nature of frequent government policy changes. Finally, the variables 'senior management originates most strategic innovation' and 'high rate of technological change' are the only Likert variables where the means are not statistically different from 4.0. This applies to both university and FE college samples. The implication is that respondents take a neutral stance on these two questions.

Next, it would be useful to assess the correlation between each of the control variables separately with SIB, as set out in Table 8.24. Only significant values are presented.

Table 8.24 Correlation between organisational and environmental control variables and SIB

Control variable	Whole sample r	Universities r	FE colleges r
Income			-.208*
Strong organic culture	.319**		.427**
Senior management originates most strategic innovation			
Senior management plays dominant role in strategic partnerships	.207**†		.213*†
Professional resistance to change			
High rate of technological change			
Strong sector competition	.306**†		.373**†
Frequent government policy changes			

Only significant values of "r" are shown. †p<.10, *p<.05, **p<.01
†Spearman rho correlation
Source=fieldwork/SPSS

There are several notable findings. Firstly, for the whole sample, the relationship between organic culture and SIB is moderate, positive and significant for the whole sample. This appears to support the theory strongly espoused in the literature review. However, although the result holds for FE colleges, it does not hold at all for universities. This is a surprising result from both a technical and theoretical point of view, as organic culture, theoretically, is closely related to organisational learning, which, for universities, is significantly related to strategic innovative behaviour. Secondly, there is a mild, positive, significant relationship between senior managers playing a dominant role in strategic partnerships and strategic innovative behaviour, but only for FE colleges and not for universities. This may be because FE colleges are typically much smaller than universities and an FE college principal typically has a relatively more commanding position than does a vice-chancellor. Thirdly, the relationship between sector competition and SIB is moderate, positive and significant, but only in respect of FE colleges. One possible explanation is that competition has more effect on FE colleges because of their sparser funding by the government and they consequently have less financial slack to buffer them against competitive pressures. Or, it could be that FE colleges are typically located in metropolitan areas with strong local competition. Fourthly, despite FE colleges strongly believing that the

government make too frequent policy changes, this belief does not appear to influence their SIB. It might have been thought that one of the purposes of government policy change would be to influence innovative behaviour. This does not appear to be a consequence. Finally, there is a mild, negative, but significant relationship between income and SIB in respect of FE colleges.

Having examined the control variables using univariate statistics and their covariate relationship with SIB, we now examine the important test – do any of the organisational and environmental control variables influence the relationship between CB and SIB. This is tested by a partial correlation analysis as set out in Table 8.25

Table 8.25 Correlation between CB and SIB after controlling for organisational and environmental factors

	Whole sample r	Universities r	FE colleges r
Zero order correlation ➔	.357***	.453***	.366***
After controlling for ➔			
Income	.376***	.453***	.364***
Strong organic culture	.306***	.445***	.274**
Senior management originates most strategic innovation	.369***	.449***	.375***
Senior management plays dominant role in strategic partnerships	.349***	.432***	.361***
Professional resistance to change	.357***	.461***	.365***
High rate of technological change	.355***	.453***	.361***
Strong sector competition	.342***	.439***	.359***
Frequent government policy changes	.379***	.452***	.380***

†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

The organisational mediator, organic culture, has a small influence on the relationship for FE colleges, but not for universities. For FE colleges the value of r reduces from .366*** to .274**. No theoretical reason for this difference is proposed. None of the other control variables have any notable influence on the relationship between CB and SIB. Thus, it can be concluded that the moderate, positive and significant relationship between CB and SIB holds when controlled by organisational and environmental factors.

8.4.5 Finding 7 – Perceived importance of each of the main collaborator types

We now turn to RO2. In the first instance, the univariate statistics for the three main collaborator types are assessed, as set out in Table 8.26. These variables are based on multi-item scales, each item being mainly a Likert style question.

Table 8.26 Univariate statistics for the three main collaborator type variables

Collaborator type	Whole sample	Universities	FE colleges	U v FE significant t-test
All collaborators	5.0	5.1	5.0	0.016
Educational service providers	5.2	5.2*	5.1*	0.688
Government agencies	4.4	4.7	4.2	0.008
Professional networking	5.5	5.3*	5.6*	0.185

*means are significantly different from 4.0
Source=fieldwork/SPSS

The values for the aggregate of all collaborator types for the whole sample and for each of the separate university and FE college samples are over 5. These values are based on 7-point Likert items and are well over the mid-point of 4. A reasonable interpretation would be that respondents had a positive perception of their collaborative behaviour. In fact, all the values for peer group providers and professional networking are well over 5. It is the values for government agencies which are somewhat lower, although they are still above 4. Using the independent samples t-test, one can see that there is a significant difference in means between universities and FE colleges for "All collaborators" and, when drilled down to the constituent collaborator types, there is a significant difference in means for government agencies, the university score being somewhat higher than the FE college score. This continues the rather negative results for the association between government agencies and FE colleges. In the next layer down, government agencies is made up of variables representing relationship building and collaborative working, respectively. Drilling down into this layer gives the values set out in Table 8.27.

Table 8.27 Univariate statistics for the activities with government agencies variable

Government agency relationship activity	Universities	FE colleges	U v FE significant t-test
Relationship building	4.9	4.6	0.139
Collaborative working	4.6	4.0	0.003

One-sample t-test not applied
Source=fieldwork/SPSS

Using the independent samples t-test, the significant difference between university and FE college means is in 'Collaborative working' rather than 'Relationship building'. It would appear that routine contact between government agencies and FE colleges does not necessarily lead to follow through collaborative working.

8.4.6 Finding 8 – Perceived importance of each of the nine spectrum collaborator types

For each of the nine spectrum collaborator types, the questionnaire has three relationship activities – frequency of formal dealings, significance of collaborative activity and importance as a source of innovative ideas. Each item is a simple yes/no indicator and not a Likert style question.

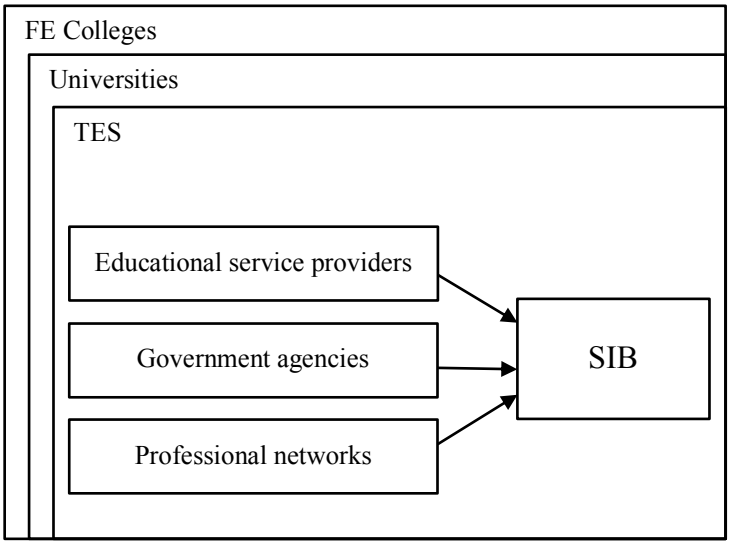
Univariate statistics were compiled for each of these three relationship activities. In assessing these statistics, the following findings can be summarised:

- With regard to frequency of formal dealings, over 50% of respondents, in respect of both universities and FE colleges, have dealings with all nine collaborator types at least weekly;
- With regard to collaborative activity, over 40% of respondents, in respect of both universities and FE colleges, have significant collaborative activity with both educational providers and employers; the remaining collaborator types each scored less than 30% significant collaborative activity;
- With regard to importance as a source of innovative ideas, around 60% of respondents, in respect of both universities and FE colleges, cite peer group educational providers as a source of ideas; around 50% of respondents, in respect of both universities and FE colleges, cite employers, student groups and

professional networks, as a source of ideas; and all other collaborator types were cited by less than 30% of respondents.

8.4.7 Finding 9 - Correlation between each of the main collaborator types and SIB

Figure 8.5 – Model showing the relationship CB ⇨SIB, by the three main collaborator types



We now explore the important question as to the correlation between main collaborator types and SIB, as set out in Table 8.28.

Table 8.28 Correlation between each of the three main collaborator types and SIB

Collaborator type	Whole sample r	Universities r	FE colleges r
CB	.36***	.45***	.37***
Educational service providers	.202*	.305*	.172
Government agencies	.045	.320*	-.040
Professional networking	.305***	.332*	.279**

†p<.10, *p<.05, **p<.01, ***p≤.001

Source=fieldwork/SPSS

The moderate, positive and significant relationship between CB and SIB is repeated in the first line above as a benchmark. However, when drilling down to the three main collaborator types, the relationships with SIB are mixed. It can be seen that for

universities, the relationship between each of the three collaborator types and SIB is moderate, positive and significant. However, for FE colleges, only the professional networking type is positive and significant. There is a positive relationship in respect of educational service providers, but it is weak and not significant, and the relationship in respect of government agencies is in fact negative, although not significantly so. Given the overall value for r of .37, why are some of the individual collaborator type values so disappointing. This question is addressed next.

Consistency of the Collaborative Behaviour components

The question was asked in the previous sub-section, given that the value of r = .37 is significant for the correlation between CB and SIB, why is the correlation between individual collaborator types and SIB so patchy. To answer this question, it is necessary to look at all the components of the collaborative behaviour construct and these are set out in Table 8.29.

Table 8.29 Correlation between each component of CB and SIB

Collaborator type	Whole sample r	Universities r	FE colleges r
CB construct	.36	.45	.37
Component variables			
Educational service providers	.202*	.305*	.172
Government agencies	.045	.320*	-.040
Professional networking	.305***	.332*	.279**
Number of peer group partners	.151	.050	.279**
Spectrum collaborator types – frequency of contact	.262***	.284*	.297**
Spectrum collaborator types – significant collaborative activity	.307***	.395**	.322**

†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

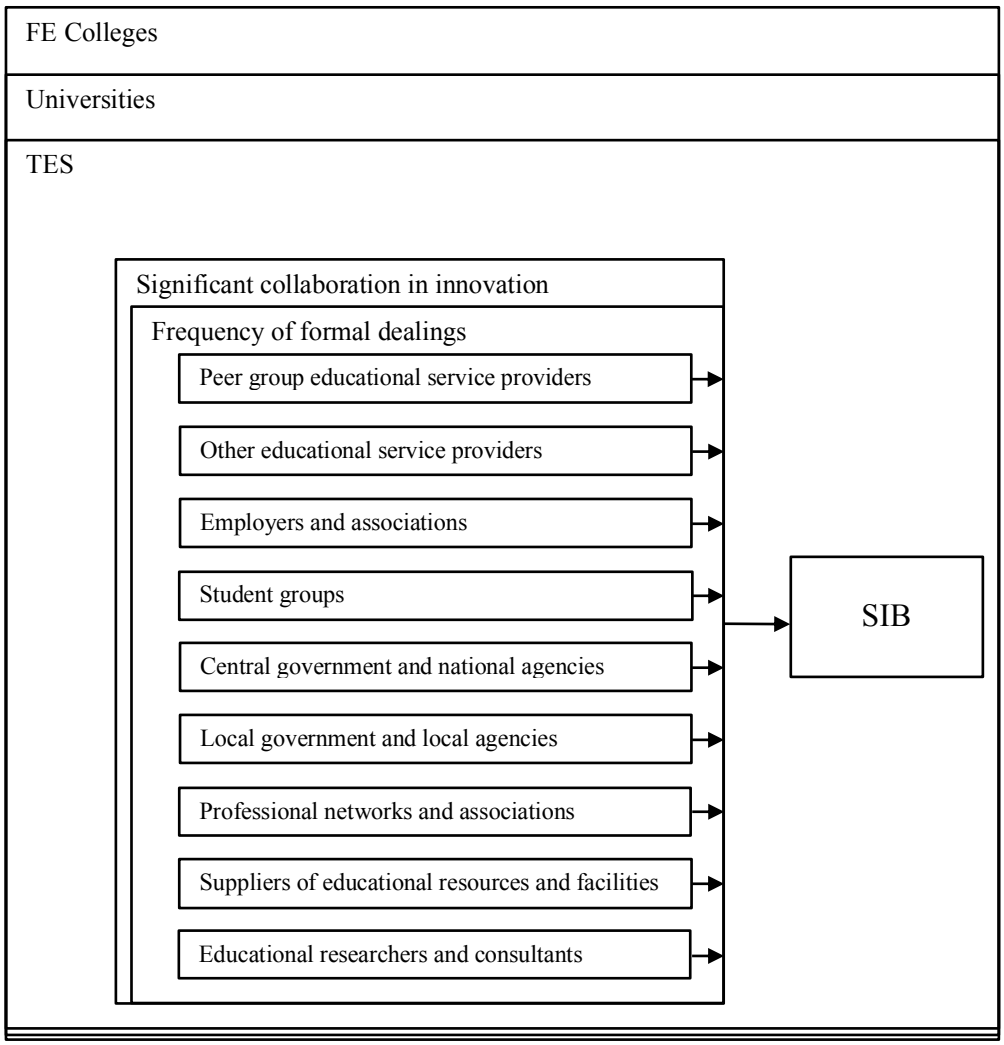
With regard to universities, for five of the six component variables, there is a moderate, positive and significant correlation with SIB. The sixth component, number of partners, has a small positive correlation with SIB, but this is not significant. With regard to FE colleges, for four of the six component variables, there is a moderate,

positive and significant correlation with SIB. One component, educational service providers has a mild, positive, but not significant correlation with SIB and the remaining component, government agencies, has a mild negative correlation – as might be expected from other evidence in this chapter. It is notable that the two spectrum indicators, and, of these, especially 'significant collaborative activity', have a moderate, positive and significant correlation with SIB for both universities and FE colleges.

Thus, while the correlation for some components of collaborative behaviour with SIB is significant, for other components, it is not. Does this mean that the specification of CB could be improved? For example, could government agencies be removed? The argument against this is twofold. Firstly, government agencies is a genuinely important external player for TES dealings and theoretically should be included and, secondly, the correlation values in respect of universities is significantly positive. The educational service providers' correlation is rather poor. Could the specification of this variable be improved? Well Cronbach's alpha for this variable for both universities and FE colleges is very high. This variable is made up of eight items. In the case of universities, 7 of 8 items individually correlate significantly with SIB. However, in the case of FE colleges, only 2 of 8 items individually correlate significantly with SIB. This is a possible limitation. In these circumstances, one must conclude that although CB as specified in this research performs its function adequately, in any further research, it would warrant further investigation.

8.4.8 Finding 10 - Correlation between each of the spectrum collaborator types and SIB

Figure 8.6 – Model showing the relationship CB ⇨SIB, by the spectrum collaborator types



The next step is to examine the correlation between each of the spectrum group of collaborator types and SIB. This is set out in Tables 8.30. Only significant values are presented.

Table 8.30 Correlation between the spectrum collaborator types and SIB

Collaborator type	Activity types			
	Frequent formal dealings		Significant collaboration in innovation activities	
	Universities r	FE colleges r	Universities r	FE colleges r
Peer group educational providers				
Other educational providers				.22*†
Employers and employer groups	.33*†	.22*†	.29*†	.32**†
Student groups				.25*†
Central government agencies			.31*†	
Local government agencies				
Professional and sector networks	.32*	.25*†	.22†	
Suppliers of educational facilities		.34**†		
Educational researchers and consultants		.26*†		

Only significant values of "r" are shown †p<.10, *p<.05, **p<.01
†Spearman rho correlation
Source=fieldwork/SPSS

What stands out is the pattern of scores for employers. These are significant for both activity types for both universities and FE colleges. The only other collaborator type with any sort of pattern is professional networking, but the values and significance of "r" are lower and there is an important gap for FE colleges in the collaborative activity column.

8.4.9 Finding 11 – Which collaborator type has the greatest influence over SIB

The evidence from Findings 3,7,8,9 and 10 is summarised in Table 8.31.

Table 8.31Evidence for which collaborator type has the strongest relationship with SIB

Source of evidence	Summary of Findings
Finding 3 - Free form innovation examples	Examples of innovation related to employer engagement show strongly, especially, but not only, for FE colleges
Finding 7 - Univariate statistics - three main collaborator types	Educational service providers and professional networking, but not government agencies, show strongly for both universities and FE colleges
Finding 8 - Univariate statistics - spectrum of collaborator types	Educational service providers and employers show strongly in respect of collaborative activity; educational service providers, employers, student groups and professional networks show strongly as sources of innovative ideas
Finding 9 - Covariate statistics - three main collaborator types	For universities, there is a moderate, positive and significant relationship between all three main collaborator types and SIB. However, for FE colleges, this relationship is only moderate, positive and significant for professional networking and mildly positive and barely significant for educational service providers.
Finding 10 - Covariate statistics concerning - spectrum of collaborator types	There is a pattern of moderate, positive and significant relationships between employers and innovative behaviour for both universities and FE colleges; there is a patchy and milder, positive and significant relationship between professional networking and innovative behaviour.

Source=Author

It is clear that no one collaborator type stands out in every piece of evidence as having the strongest influence on strategic innovative behaviour. Therefore, the balance of evidence has to be weighed, and, in this regard, more weight should be given to the free form responses (since these include substantive examples) and the covariate statistics (since covariate statistics are more powerful than univariate). Government agencies stand out as easily having the weakest influence of the three main collaborator types. Therefore, the choice for strongest influencer is between educational service providers, professional networking and employers. Taking into consideration the covariate statistics concerning the three main collaborator types, professional networking has more influence, across the whole sample, than educational service providers. Unfortunately, employers were not included as one of the prime collaborator types.

However, they are included in the covariate statistics concerning the spectrum of collaborator types, and, in these statistics, employers clearly have more influence even than professional networking. Also, employers show strongly in the free form innovative examples. Therefore, if one had to rank these three collaborator types, on this evidence, it would be employers, followed by professional networking, followed by educational service providers. However, all three collaborator types are important influencers of innovative behaviour.

8.5 ORGANISATIONAL LEARNING VERSUS INSTITUTIONAL CONFORMING

8.5.1 Introduction

The secondary topic of this research is whether organisational learning (OL) or institutional conforming (IC) influences strategic innovative behaviour (SIB) more. This topic is addressed in the following two research objectives:

RO6: To identify whether organisational learning or institutional conforming influence strategic innovative behaviour more.
and
RO7: To identify whether organisational learning or institutional conforming influence collaborative behaviour more.

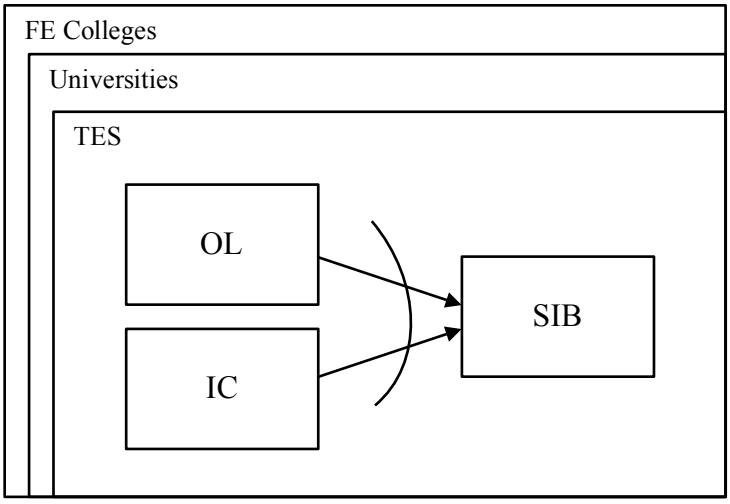
RO6 is met by five specific findings. Finding 12 (8.5.2) is a statistical correlation which compares the relationship between OL and SIB with the relationship between IC and SIB. Finding 13 (8.5.3) tests whether this comparison holds for all innovation types. Finding 14 (8.5.4) tests whether this relationship holds for each control variable. Finding 15 (8.5.5) is an additional test which examines whether either of OL or IC mediates the relationship between CB and SIB. Finally, and in view of the strength of the OL variable, Finding 16 (8.5.6) tests the interaction between CB, OL and OC (organic culture, a conceptually related organisational control variable).

RO7 is met by Finding 17 (8.5.7), which is a statistical correlation which compares the relationship between OL and CB with the relationship between IC and CB.

Both organisational learning (OL) and institutional conforming (IC) are multi-item constructs where each item is based on 7-point Likert samples.

8.5.2 Finding 12 – a comparison between the respective influence of OL v IC on SIB

Figure 8.7 – Model comparing OL ⇨ SIB versus IC ⇨SIB



In the first instance, we will examine the perceived importance of each of OL and IC using univariate statistics, as set out in Table 8.32.

Table 8.32 Univariate statistics for OL and IC

Variable	Whole sample	Universities	FE colleges	U v FE significant t-test
OL	5.4	5.4*	5.5*	0.357
IC	3.3	3.3*	3.4*	0.286

*means are significantly different from 4.0
Source=SPSS

For OL, the mean score is much higher than the mid-point 4, while for IC, the mean is somewhat below the mid-point 4. For both OL and IC, the means for universities and

FE colleges are very similar with no significant differences, using the independent samples t-test.

Now, we will compare the covariate statistics for OL and IC against SIB, as set out in Table 8.33.

Table 8.33 Correlation statistics for the relationships between OL and SIB and between IC and SIB

Variable	Whole sample r	Universities r	FE colleges r
OL	.43***	.40***	.44***
IC	-.23**	-.27*	-.24*

†p<.10, *p<.05, **p<.01, ***p≤.001

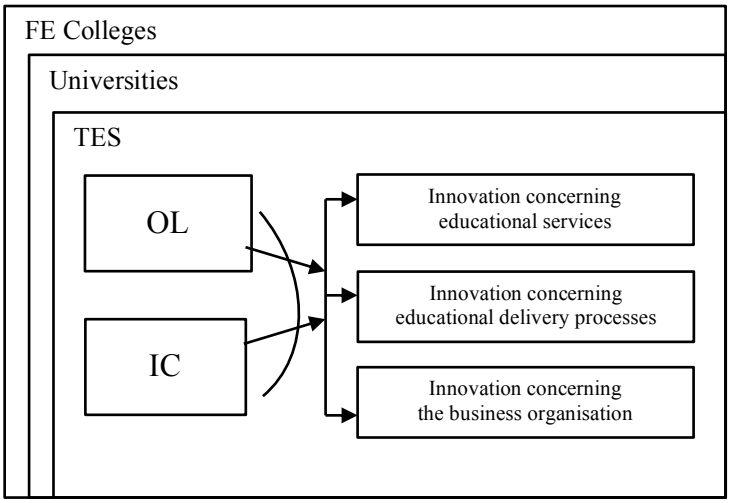
Source=fieldwork/SPSS

In all three samples, the relationship between OL and SIB is moderate, positive and significant at least at the .001 level. And, in all three samples, the relationship between IC and SIB is mild, negative and significant at least at the .01 level.

Taking the univariate and covariate statistics together, there is strong evidence that strategic innovative behaviour is significantly influenced by organisational learning and negatively influenced by institutional conforming.

8.5.3 Finding 13 - A comparison between the respective influence of OL v IC on SIB, allowing for innovation clusters

Figure 8.8 – Model comparing OL⇨SIB versus IC⇨SIB, by innovation cluster



This comparison is set out in Table 8.34

Table 8.34 Correlation statistics for the relationships between OL and IC, respectively, and each of the three innovation clusters

Variable ➔ Innovation cluster ➘	Organisational Learning r	Institutional Conforming r
Curriculum/ client changes	.494***	-.102
Teaching and learning changes	.439***	-.133
Business organisation changes	.569***	-.059

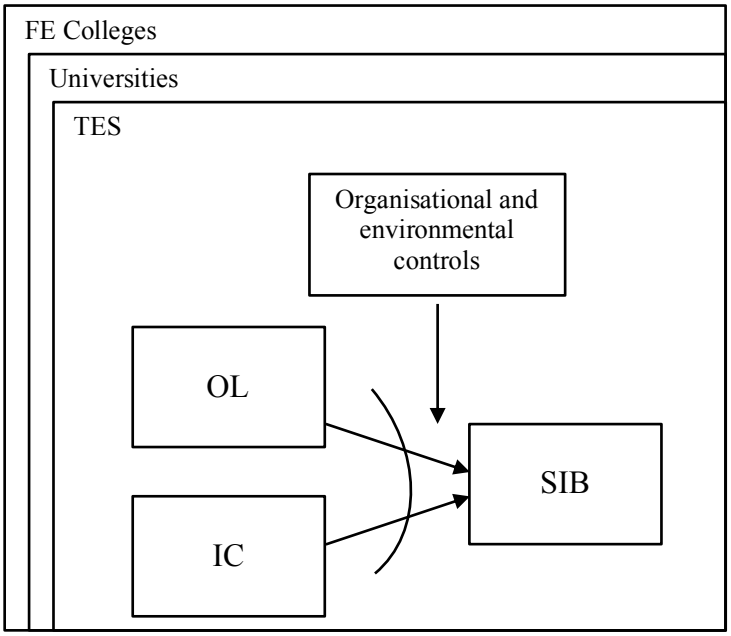
†p<.10, *p<.05, **p<.01, ***p≤.001

Source=fieldwork/SPSS

The values for OL are at least moderate, positive and significant, while the values for IC are mild, negative but are not significant. Thus the conclusions in Finding 12 hold for all innovation clusters.

8.5.4 Finding 14 - A comparison between the respective influence of OL v IC on SIB, allowing for each control variable

Figure 8.9 – Model comparing OL⇨SIB v IC⇨SIB, by controls



The second contingency to be tested is whether the conclusion holds when the relationships are controlled for organisational and environmental factors. This uses partial correlation analysis as set out in Table 8.35.

Table 8.35 Partial correlation statistics for the relationships between OL and IC, respectively, with SIB, controlling for organisational and environmental factors.

Variable ➔	Organisational Learning r	Institutional Conforming r
Zero order correlation with SIB	.428***	-.233***
Control variable ➘		
Income	.430***	-.272***
Strong organic culture	.316***	
Senior management originates most strategic innovation	.430***	-.241**
Senior management plays dominant role in strategic partnerships	.410***	-.227**
Professional resistance to change	.415***	-.209**
High rate of technological change	.421***	-.218**
Strong sector competition	.417***	-.236**
Frequent government policy changes	.426***	-.243**

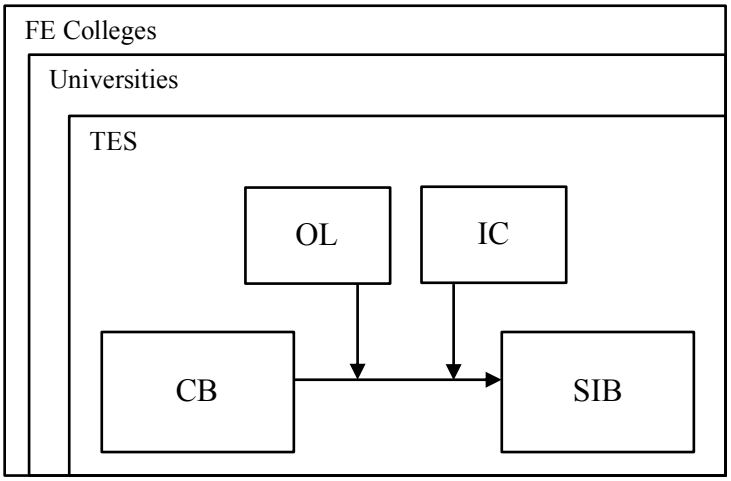
†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

Organic culture has some mediating influence on both OL and IC relationships with SIB. In the case of OL, the value of r is slightly reduced, although it still remains moderate, positive and significant. In the case of the IC, there is a modest reduction in the negative relationship, although it still remains mild, negative and significant.

None of the other control variables have any notable influence on the relationship between CB and SIB. Thus the conclusion is that Finding 12 holds for all control factors.

8.5.5 Finding 15 - Correlation between CB and SIB, controlling for OL and IC

Figure 8.10 – Model showing the relationship CB ⇨SIB, controlled by OL and IC, respectively



Having compared the influence of OL and IC on SIB, it would be interesting to examine whether OL and IC might mediate the relationship between CB and SIB. This is tested by using partial correlation analysis and is set out in Table 8.36.

Table 8.36 Correlation between CB and SIB, when controlling for OL and IC

Controlling for….➔ Sample ⬇	Zero order correlation r	OL r	IC r
Whole sample	.357***	.185*	.345***
Universities	.453***	.335***	.437***
FE colleges	.366***	.160	.363***

†p<.10, *p<.05, **p<.01, ***p≤.001

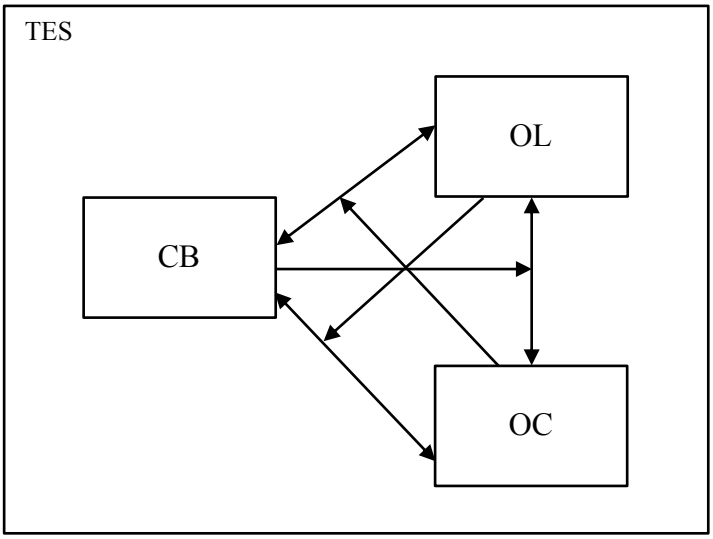
Source=fieldwork/SPSS

From the earlier results, we would expect that OL rather than IC would have a moderating effect on the relationship between CB and SIB, and this is confirmed in the above table. OL has a marked effect on the zero order correlations – not so much in the case of universities, which only reduces from .453*** to .335***, and so is still moderate, positive and significant – but especially in the case of FE colleges, which reduces from moderate, positive and significant r of .366*** to a mild, positive and non-significant r of .160.

IC has no effect on the relationship between CB and SIB.

8.5.6 Finding 16 - Associations between CB, OL and OC

Figure 8.11 – Model showing the inter-relatedness between CB, OL and OC



From the results in this chapter, there would appear to be a clear interaction between some of the independent variables – viz. collaborative behaviour (CB), organisation learning (OL) and organic culture (OC). All three describe a facet of organisational behaviour, and it would be instructive to see how they are associated. Table 8.37 shows how each of these variables are correlated with strategic innovative behaviour (SIB).

Table 8.37 Correlations of key independent variables CB, OL and OC, respectively, with SIB

Independent variable	Whole sample	Universities	FE colleges
	r	r	r
CB	.357***	.453***	.366***
OL	.428***	.404**	.435***
OC	.319***	.084	.427***

†p<.10, *p<.05, **p<.01, ***p<.011
Source=fieldwork/SPSS

Examining the whole sample, all three variables appear to be moderately, positively and significantly associated with CB. However, in examining the university and FE college samples separately, it can be seen that for universities, OC is very weakly

associated with CB. It is not conceptually obvious why there should be such a large difference between universities and FE colleges. It may be that OC is a less reliable indicator of SIB than the other two independent variables.

The next table shows the three variables correlated with each other in turn, with the third variable acting as a mediating variable. The whole sample has been used.

Table 8.38 Mutual partial correlation analyses for the three key independent variables, CB, OL and OC

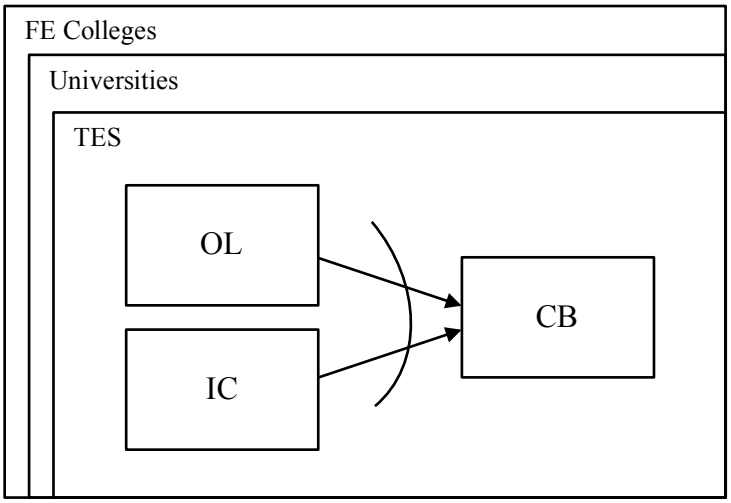
Relationship	Zero order correlation r	Control for	Partial correlation r
CB ⇨ OL	.494***	OC	.425***
CB ⇨ OC	.277***	OL	-.008
OL ⇨ OC	.572***	CB	.521***

†p<.10, *p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

The strong associations between OL and CB and between OL and OC are only slightly affected by the intervention of the third variable. However, the moderate association between CB and OC is completely removed with the intervention of OL. This clearly indicates the dominance of the OL indicator and suggests that it may be an antecedent of the other two variables. This same pattern of results is obtained for both the university and FE college samples, when run separately.

8.5.7 Finding 17 - a comparison between the respective influence of OL v IC on CB

Figure 8.12 – Model comparing OL ⇨ CB versus IC ⇨CB



Finding 12 compares OL v IC ⇒ SIB.

Here, in Table 39, the covariate statistics for OL and IC are compared against CB, rather than SIB.

Table 8.39 Correlation statistics for the relationships between OL and IC, respectively, and CB

Variable	Whole sample r	Universities r	FE colleges r
OL	.494***	.439***	.569***
IC	-.102	-.133	-.059

†p<.10, *p<.05, **p<.01, ***p≤.001
Source=fieldwork/SPSS

There is at least a moderate, positive and significant correlation between OL and SIB for the whole sample and for universities and for FE colleges. In fact, in the latter case, the relationship is strongly positive. The relationship between IC and SIB is negative but not significant.

8.6 CORRELATION MATRIX AND PATH MODEL

8.6.1 Introduction

A correlation matrix provides a comprehensive picture of the correlation between all major variables. It is used in this thesis to explore patterns and anomalies and to choose the variables for inclusion in a path model and the multivariate analyses. The path model and associated analysis are also developed in this section.

8.6.2 Finding 18 – The correlation matrix - patterns and anomalies

The correlation matrix, in respect of the whole sample, is set out in Table 8.40, overleaf. It highlights several interesting observations. Firstly, one of the innovation clusters – 'changes to teaching and learning methods' - which is about process change, is markedly more highly correlated with collaborative behaviour and organisational learning, than the other two innovation clusters. This could imply that this cluster of innovations has a high organisational learning content. Secondly, government related collaborative behaviour has a poorer correlation with all innovation related variables, than any other collaborator type. Thirdly, organisational learning has a positive, significant relationship with all innovation related variables, including innovation success, and all collaborative behaviour component variables. Fourthly, institutional conforming is negatively related to all other variables except one and this one is only marginally positive. Finally, strong sector competition has a positive, significant relationship with all innovation clusters, but not with innovation success.

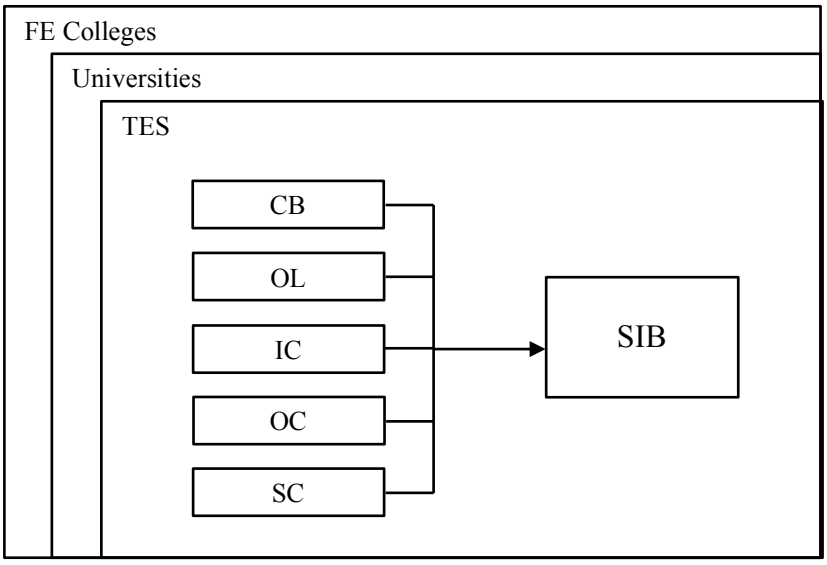
Table 8.40 Correlation matrix for all major variables - Whole sample †p<.10, *p<.05, **p<.01, ***p≤.001 (Source=fieldwork/SPSS)

		Innovation					Relationships										
		Strategic Innovative Behaviour	Innovation success	Service innovation	Process innovation	Business innovation	Collaborative Behaviour	Relationships contact	Relationships ideas	Relationships collaboration	Partner Nos	Strongest Partner relationship	Government relationships	Professional relationships	Organisational learning	Institutional Conforming	Organic culture
Innovation	Innovation success	.468 ***	1														
	Service innovation	.819 ***	.309 ***	1													
	Process Innovation	.758 ***	.513 ***	.479 ***	1												
	Business Innovation	.817 ***	.324 ***	.487 ***	.408 ***	1											
Relationships	Collaborative Behaviour	.357 ***	.205 **	.246 **	.370 ***	.255 ***	1										
	Relationships contact	.262 *	.093	.199 *	.308 ***	.140 †	.525 ***	1									
	Relationships ideas	.182 *	.066	.113	.180 *	.147 †	.419 ***	.242 **	1								
	Relationships collaboration	.307 ***	.179 *	.202 *	.361 ***	.192 *	.607 ***	.432 ***	.483 ***	1							
	Partner Nos	.151 †	.070	.156 †	.178 *	.044	.546 ***	.342 ***	.114	.264 ***	1						
	Strongest Partner relationship	.202 *	.076	.142 †	.207 **	.144 †	.613 ***	.033	.170 *	.172 *	.136 †	1					
	Government relationships	.045	.044	-.043	-.025	.156 †	.604 ***	.249 **	.208 **	.208 **	.211 **	.262 ***	1				
	Professional relationships	.305 ***	.241 **	.227 **	.306 ***	.210 **	.626 ***	.206 **	.277 ***	.193 *	.136 †	.273 ***	.229 **	1			
	Organisational Learning	.428 ***	.478 ***	.327 ***	.469 ***	.256 ***	.494 ***	.210 **	.142 †	.189 *	.245 **	.282 ***	.219 **	.530 ***	1		
	Institutional Conforming	-.233 **	-.216 **	-.174 *	-.221 **	-.171 *	-.102	-.043	.039	-.097	-.070	-.020	.065	-.174 *	-.286 ***	1	
	Organic culture	.319 ***	.367 ***	.299 ***	.341 ***	.149 †	.277 ***	-.006	.005	.010	.165	.181 *	.115	.432 ***	.572 ***	-.252 **	1
	Sector competition	.278 ***	.005	.184 *	.238 **	.244 **	.111	.077	.074	.073	.088	.125	-.016	.042	.109	-.024	-.021

8.6.3 Choice of variables for the path model and the multivariate analyses

The set of variables chosen for the path model and multivariate analyses include those with a strong conceptual relationship with strategic innovative behaviour, ie collaborative behaviour, organisational learning and institutional conforming and other variables with a strong statistical association with strategic innovative behaviour, ie organic culture and sector competition.

Figure 8.13 – Model showing the variables selected for the path analysis and multivariate analyses



The coefficients for the correlation between each of these five independent variables and the dependent variable are as follows.

Table 8.41 Correlation statistics for the independent variables chosen for the multivariate analyses

Independent variable	Pearson's 'r' for the relationship between the specified independent variable and strategic innovative behaviour		
	Whole sample	University sample	FE college sample
Collaborative behaviour	.357***	.453***	.366***
Organisational learning	.428***	.404***	.435***
Institutional conforming	-.233**	-.271**	-.239**
Organic culture	.319***	.084	.427***
Sector competition	.278***	.156	.340***

*p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

As was noted in Section 8.4.4, a significant relationship between OC and SC, respectively, with SIB only holds for FE colleges and not for universities.

Strictly speaking, only interval variables should be included. It is customary to treat multi-item Likert scales as interval variables (Malhotra & Birks, 2000; Pallant, 2000). According to these rules, the dependent, independent and control variables in the above list can be included, except for sector competition, which is a single item Likert scale. However, the question is whether it would be better to omit sector competition because it fails the theoretical test or whether the act of omission is actually worse than the flawed act of commission. In this regard, it is worth noting the comparison between Pearson's r values (testing for linear relationships) and Spearman rho values (testing for ranked relationships). These are set out in Table 8.42.

Table 8.42 Comparison between Pearson r and Spearman rho for the sector competition variable

	Whole sample	Universities	FE colleges
Pearson	.278 (.000)	.156 (.255)	.340 (.000)
Spearman	.306 (.000)	.178 (.194)	.373 (.000)

Source = Author

It can be seen that the values of Pearson are very close to those of Spearman for all three samples. On balance, it has been decided that it would be better to include sector competition in both the path analysis and the multivariate analyses, but to indicate what effect there would be if the variable were omitted.

8.6.4 Finding 19 – Development of path model

Along with multivariate analysis, path model analysis contributes to solving Research Objective 9. Only the whole sample is being explored in this path analysis. The first step is to draw a model consisting of the dependent variable and the deduced causal influence of the independent variables. CB is the prime independent variable in this thesis. OL, IC and OC, which say something fundamental about organisational values, are assumed to be antecedents of CB. It is a moot point whether OL/IC is an antecedent of OC, whether it is vice versa or whether they are equal. The findings in Section 8.5.6 suggest that OL is an antecedent of OC and, since OL and IC represent

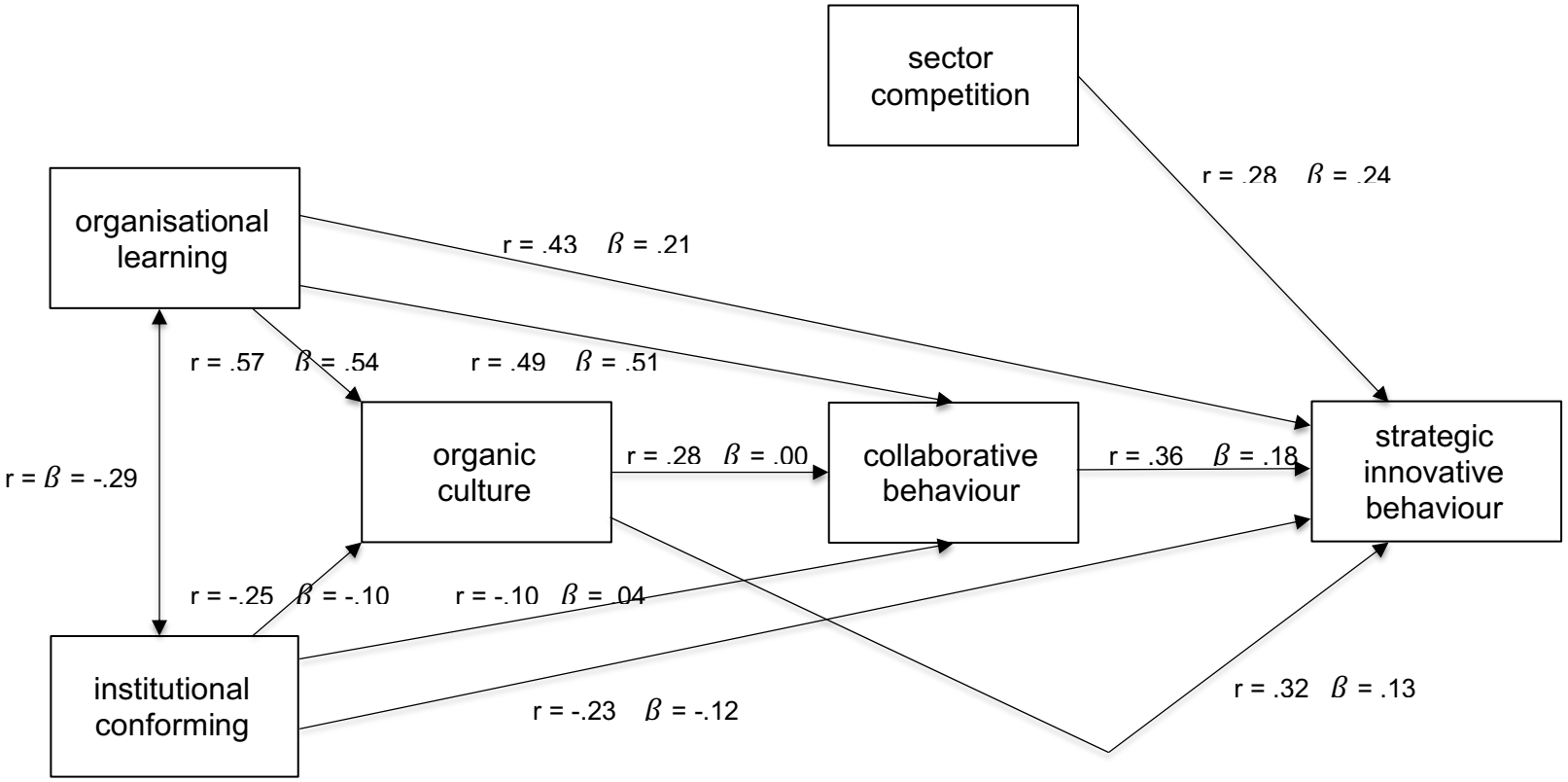
opposing attitudes, OL and IC are assumed to be of equal antecedence. SC is an environmental variable and independent of the other independent variables, which are organisational. The causal model is depicted in Figure 8.14, at the end of this sub-section. Next, a linear regression is run using the independent variables with a direct path to SIB, which in this case are all 5 independent variables. Values of r and the β coefficients are inserted into the model in Figure 8.14. Note that the values of β, if sector competition is excluded, are .19 for CB, .27 for OL and .11 for OC. The value of β is the direct effect and the value of β divided by r, gives the proportion of the indirect effect. Finally, linear regressions are run for all indirect paths, which in this case consist of: 1) CB as dependent variable and OL, IC and OC as independent variables; and 2) OC as dependent variable and OL and IC as independent variables.

The moderately positive relationship between both CB and SIB and between OL and SIB was established in earlier sections. However, this path analysis shows that the respective influences of CB and OL on SIB are approximately equally split between direct and indirect effects (a somewhat higher direct effect in respect of OL, if SC is omitted). In fact, the only indirect influence on CB, in this model, is OL. Furthermore, it is interesting to note that the combined β for the organisational related variables, CB, OL and OC, are 0.52 (R^2 = .22) (slightly higher, if SC is omitted).

8.6.5 Test for any feedback influence from strategic innovative behaviour

For the sake of completeness, a test is made for any feedback of the dependent variable, SIB, on any of the key independent variables. A partial correlation is run for the whole sample using CB and OL as the zero order correlations. When SIB is the controlling variable, r reduces from .494*** to .404***. The difference is relatively small and indicates a relatively unimportant feedback influence.

Figure 8.14 Path analysis for the whole sample



Source = Author

8.7 MULTIVARIATE ANALYSES

8.7.1 Introduction

This section, together with the path models developed in Section 8.6.4, addresses the following research objective.

RO9: Using the results from Research Objectives 2 and 6, to develop a statistical model that identifies the relative contributions made by the key independent variables influencing strategic innovative behaviour.

Given a model with a single dependent variable and several independent variables, multivariate analysis identifies the amount of variance explained by specified independent variables acting together and the separate contribution to that variance made by each of the independent variables. The five independent variables chosen for this analysis are specified in Section 8.6.3. In addition, income and Guardian added value are input as control variables in the sequential multivariate analysis runs.

Nine multivariate models have been run in all, three each for the whole sample, the university sample and the FE college sample, respectively. For the whole sample, the first model is a standard multivariate analysis using the five independent variables. The results show that a more efficient model consists of only three of these independent variables, viz. collaborative behaviour, organisational learning and sector completion. Thus the second model for the whole sample is a standard multivariate analysis using only these three more efficient independent variables. The third model for the whole sample is a sequential multivariate analysis, with the first pass including the control variable, income category, and the second pass containing the three efficient independent variables. A similar approach to the construction and execution of the three models is performed on the separate university and FE college samples, respectively.

For each of the nine models, there is a table of results, a preliminary analysis (which examines the assumptions for multivariate analysis) and an interpretation of the results. The table of results includes the β and sr^2 values for each independent variable, the

shared variance, the original and adjusted R^2 and each relevant significance level. The analysis and presentation is based on Pallant (2010).

With regard to the assumptions, it should be noted that, using Green's (1991) rule of thumb to identify the required number of cases given the number of independent variables, the number of cases comfortably exceeds the threshold for the whole sample analyses, is marginally reasonable compared with the threshold for the FE college sample analyses but is a little low compared with the threshold for the university sample. Relatively small samples limit the reliability of the results, particularly for the university sample, and must temper any conclusions. In the summary, 95% confidence intervals are given, which Tabachnick & Fidell (2007) say is a more reliable approach than quoting the significance levels.

8.7.2 Finding 20 - Whole sample – Standard run 1

A standard multiple regression analysis was run using the five independent variables, with the following results.

Table 8.43 Whole sample – Standard run 1 - results

	β	sr^2
Independent variables		
Collaborative behaviour	.182*	.025
Organisational learning	.207*	.023
Institutional conforming	-.118	.013
Organic culture	.125	.010
Sector competition	.235**	.054
R^2	.287	
Shared variance		.162
Adjusted R^2	.263	
F	12.06***	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for Whole sample – Standard run 1

The preliminary checks are satisfactory, as shown in the following table.

Table 8.44 Whole sample – Standard run 1 - preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 109. N = 158.
Outliers	i) Mahalanobis distance =16.18, which is less than the threshold of 20.52. ii) All standardised residuals are between -3.3 and +3.3.
Multicollinearity and singularity	i) No inter-correlation of the five independent variables is > 0.5 – well below the 0.9 threshold. ii) All tolerance values > 0.1 and VIF values > 10. iii) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for Whole sample – Standard run 1

The five core independent variables together explain 28.7% of the variance in the dependent variable strategic innovative behaviour (26.3% after adjustment). The coefficient for R^2 is significant. The three independent variables which make the most contribution are collaborative behaviour, organisational learning and sector competition. The coefficients for these three variables are significant. The coefficients for the other two variables are not significant. In order to develop a more efficient model, the two variables which are not significant are removed from the Run 1 model. Of the 28.7% variance explained by the five variables, 12.5% in total is unique to the them and 16.2% is shared in some way between them.

8.7.3 Finding 21 - Whole sample – Standard run 2

A standard multiple regression analysis was run using the three independent variables found significant in Run 1 with the following results.

Table 8.45 Whole sample – Standard run 2 – results

	β	sr^2
Independent variables		
Collaborative behaviour	.176*	.023
Organisational learning	.317***	.076
Sector competition	.224**	.049
R^2	.261	
Shared variance		.113
Adjusted R^2	.246	
F	17.88***	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for Whole sample – Standard run 2

The preliminary checks are satisfactory.

Table 8.46 Whole sample – Standard run 2 - preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 107. N = 158.
Outliers	iii) Mahalanobis distance =11.83, which is less than the threshold of 16.27. iv) There is one case where the standardised residual is outside the range of -3.3 to +3.3. This case has been verified as genuine. Since it is only marginally outside the range, it has been allowed to remain.
Multicollinearity and singularity	iv) No inter-correlation of the three independent variables is > 0.5 – well below the 0.9 threshold. v) All tolerance values > 0.1 and VIF values > 10. vi) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for Whole sample – Standard run 2

The three independent variables together explain 26.1% of the variance in the dependent variable strategic innovative behaviour (24.6% after adjustment). Examining the three standardised coefficients, organisational learning makes the most contribution with a β of .317, followed by sector competition with a β of .224 and collaborative behaviour with a β of .176. Each of these coefficients is significant. Compared with Run 1, the coefficients for collaborative behaviour and sector competition have hardly changed. The coefficient for organisational learning has increased substantially. This is because it has largely subsumed the coefficients for institutional conforming and organic culture which were removed from Model Run 1. Of the 26.1% variance explained by the three variables, 14.8% in total is unique to the them and 11.3% is shared in some way between them.

8.7.4 Finding 22 - Whole sample – Sequential run 1

From the literature review, it emerged that income is the most used control variable in statistical exercises of this nature. On average, universities have a much larger income than FE colleges. Hence, raw income would not be a good measure for the whole sample. The transformed variable income category breaks each of the two samples into similarly proportioned categories and is technically better. For the whole sample, income category has a slightly negative and non-significant correlation with strategic innovative behaviour. Quality is a possible alternative to income. However, the measures for quality are completely different for universities and FE colleges and so this measure cannot be used as a control variable for the whole sample.

A sequential multiple regression analysis was run, using income category in the first pass and the three independent variables from Run 2 in the second pass, with the following results.

Table 8.47 Whole sample – Sequential run 1- results

	β	sr^2
Control variables		
Income category	-.031	.001
Independent variables		
Collaborative behaviour	.177*	.023
Organisational learning	.314***	.074
Sector competition	.222**	.048
R^2	.262	
ΔR^2	.255	
Shared variance		.116
Adjusted R^2	.242	
F	13.39***	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for Whole sample – Sequential run 1

The preliminary checks are satisfactory.

Table 8.48 Whole sample – Sequential run 1 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 108. N = 158.
Outliers	i) Mahalanobis distance =15.86, which is less than the threshold of 18.47. ii) There is one case where the standardised residual is outside the range of -3.3 to +3.3. This case has been verified as genuine. Since it is marginally outside the range, it has been allowed to remain.
Multicollinearity and singularity	i) No inter-correlation of the four independent variables is > 0.5 – well below the 0.9 threshold. ii) All tolerance values > 0.1 and VIF values > 10. iii) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for Whole sample – Sequential run 1

The control variable income category was entered in step 1, explaining only 0.7% of the variance in the dependent variable strategic innovative behaviour. This is not significant. After entry of the three independent variables in step 2, an additional 25.5% was explained. This is significant. It can be concluded that income does not significantly influence the efficient model established in Run 2.

8.7.5 Finding 23 - University sample – Standard run 1

As in the first whole sample model, a standard multiple regression analysis was run using the five independent variables, with the following results.

Table 8.49 University sample – Standard run 1 - results

	β	sr^2
Independent variables		
Collaborative behaviour	.309*	.073
Organisational learning	.256†	.040
Institutional conforming	-.197	.031
Organic culture	-.113	.013
Sector competition	.137	.017
R^2	.309	
Shared variance		.135
Adjusted R^2	.238	
F	4.375**	

†p<.10, * p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for University sample – Standard run 1

The preliminary checks are satisfactory apart from the number cases is rather low. This limits the reliability of the results.

Table 8.50 University sample – Standard run 1 - preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 109. N = 56. Clearly, this rule of thumb is violated.
Outliers	i) Mahalanobis distance =13.27, which is less than the threshold of 20.52. ii) All standardised residuals are between -3.3 and +3.3.
Multicollinearity and singularity	i) No inter-correlation of the five independent variables is > 0.5 – well below the 0.9 threshold. ii) All tolerance values > 0.1 and VIF values > 10. iii) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for University sample – Standard run 1

The five independent variables together explain 30.9% of the variance in the dependent variable strategic innovative behaviour (23.8% after adjustment – the large reduction is due to the university sample being relatively small). The coefficient for R^2 is significant. Two independent variables make the most contribution and these are collaborative behaviour with a coefficient of .309 and organisational learning with a coefficient of .256. Both these coefficients are significant. The coefficients for the other three variables are not significant. Of the 30.9% variance explained by the five variables, 17.4% in total is unique to them and 13.5% is shared in some way between them.

8.7.6 Finding 24 - University sample – Standard run 2

Although only two of the independent variables, collaborative behaviour and organisational learning were found to be significant in Run 1, for consistency with the whole sample models, sector competition is also included in Run 2. The coefficient for

sector competition was mildly positive, although not significant in Run 1. A standard multiple regression analysis was run using these three independent variables, with the following results.

Table 8.51 University sample – Standard run 2 results

	β	sr^2
Independent variables		
Collaborative behaviour	.311*	.074
Organisational learning	.278*	.061
Sector competition	.128	.016
R^2	.273	
Shared variance		.122
Adjusted R^2	.230	
F	6.39***	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for University sample – Standard run 2

The preliminary checks are satisfactory apart from the number cases is rather low. This limits the reliability of the results.

Table 8.52 University sample – Standard run 2 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 107. N = 56. Again, this rule is violated.
Outliers	i) Mahalanobis distance =10.40, which is less than the threshold of 16.27. ii) All standardised residuals are between -3.3 and +3.3.
Multicollinearity and singularity	i) No inter-correlation of the three independent variables is > 0.5 – well below the 0.9 threshold. ii) All tolerance values > 0.1 and VIF values > 10. iii) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for University sample - Standard run 2

The three independent variables together explain 27.3% of the variance in the dependent variable strategic innovative behaviour (23.0% after adjustment). Examining the three standardised coefficients, collaborative behaviour makes the most contribution with an β of .311, followed by organisational learning with a β of .278 and sector competition with a β of .176. Only the first two of these coefficients are significant. Of the 27.3% variance explained by the three variables, 15.1% in total is unique to the them and 12.2% is shared in some way between them.

8.7.7 Finding 25 - University sample - Sequential run 1

Using the arguments expressed earlier in Section 8.7.4, income category has been chosen as one of the control variables. There are two quality indicators for the university sample, 'Guardian score' and 'Guardian added value'. However, only in the latter case is the association positive, although the correlation is not significant. Hence, Guardian added value is used as a control variable as well as income category in Run 1.

A sequential multiple regression analysis was run, using Income Category and Guardian Added Value in the first pass and the three independent variables from Run 2 in the second pass, with the following results.

Table 8.53 University sample – Sequential run 1 - results

	β	sr^2
Control variables		
Income Category	-.134	.017
Guardian Added Value	-.024	.000
Independent variables		
Collaborative Behaviour	.310*	.071
Organisational Learning	.291†	.065
Sector competition	.111	.011
R^2	.292	
ΔR^2	.245	
Shared variance		.128
Adjusted R^2	.206	
F	3.38*	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for University sample – Sequential run 1

The preliminary checks are satisfactory apart from the number of cases is rather low. This limits the reliability of the results.

Table 8.54 University sample – Sequential run 1 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 109. N = 56.
Outliers	iii) Mahalanobis distance =17.60, which is less than the threshold of 20.52. iv) There are no cases outside of the range of -3.3 to +3.3.
Multicollinearity and singularity	iv) No inter-correlation of the four independent variables is > 0.5 – well below the 0.9 threshold. v) All tolerance values > 0.1 and VIF values > 10. vi) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for University sample – Sequential run 1

The control variables Income Category' and Guardian Added Value were entered in step 1, explaining only 4.7% of the variance in the dependent variable strategic innovative behaviour. In fact the influence of both variables is negative and non-significant. After entry of the three independent variables in step 2, an additional 24.5% is explained. This is significant. Examining the control variables separately, it can be seen that the one with by far the greater influence is Guardian Added Value with a β value of -.134. However, this is not significant. It can be concluded that neither Income Category or Guardian Added Value significantly influence the model established in Standard run 2.

8.7.8 Finding 26 - FE college sample – Standard run 1

As in the first whole sample model, a standard multiple regression analysis was run using the five core independent variables, with the following results.

Table 8.55 FE college sample – Standard run 1 - results

	β	sr^2
Independent variables		
Collaborative behaviour	.194†	.025
Organisational learning	.078	.003
Institutional conforming	-.117	.013
Organic culture	.251*	.037
Sector competition	.263**	.065
R^2	.330	
Shared variance		.187
Adjusted R^2	.294	
F	9.34***	

†p<.10, * p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for FE college sample – Standard run 1

The preliminary checks are satisfactory.

Table 8.56 FE college sample – Standard run 1 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 109. N = 102. The rule broken marginally.
Outliers	iii) Mahalanobis distance =12.79, which is less than the threshold of 20.52. iv) All standardised residuals are between -3.3 and +3.3.
Multicollinearity and singularity	iv) No inter-correlation of the five independent variables is > 0.7 – below the 0.9 threshold. v) All tolerance values > 0.1 and VIF values > 10. vi) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for FE college sample – Standard run 1

The five independent variables together explain 33.0% of the variance in the dependent variable strategic innovative behaviour (29.4% after adjustment). The coefficient for R^2 is significant. Three of the independent variables have coefficients which are significant. In order of size, these are sector competition, organic culture and collaborative behaviour. The coefficients of the other two independent variables are not significant. This is a surprising result. Logically, organisational learning is a better candidate than organic culture because it has a higher correlation with strategic innovative behaviour; because of the analysis in Section 8.5.6 which showed that organisational learning is likely to be an antecedent of organic culture and because of the results from the whole sample Run 2. There is a high correlation of .638 between organic culture and organisational learning. Of the 33.0% variance explained by the five variables, 14.3% in total is unique to them and 18.7% is shared in some way between them.

8.7.9 Finding 27 - FE college sample – Standard run 2

The three independent variables with the highest coefficients in Run 1 are collaborative behaviour, organic culture and sector competition. These three independent variables are chosen for entry into Run 2. However, it was expected that organisational learning would have had a higher coefficient than organic culture and so an extra run has been made with this variable instead of organic culture. Two standard multiple regression analyses were run using two sets of three independent variables, with the following results.

Table 8.57 FE college sample – Standard run 2 - results

	Using OL		Using OC
	β	sr^2	β
Independent variables			
Collaborative behaviour	.189†	.023	.219*
Organisational learning	.269*	.047	
Organic culture			.313***
Sector competition	.264**	.066	.289***
R^2	.276		.312
Shared variance		.140	
Adjusted R^2	.254		.291
F	12.348***		14.666***

†p<.10, * p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for FE college sample – Standard run 2

The preliminary checks are satisfactory.

Table 8.58 FE college sample – Standard run 2 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 107. N = 102. This rule is broken marginally.
Outliers	iii) Mahalanobis distance =9.17, which is less than the threshold of 16.27. iv) There is one case where the standardised residual is outside the range of -3.3 to +3.3. This case has been verified as genuine. Since it is marginally outside the range, it has been allowed to remain.

Test	Result
Multicollinearity and singularity	iv) No inter-correlation of the three independent variables is > 0.6 – well below the 0.9 threshold. v) All tolerance values > 0.1 and VIF values > 10. vi) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for FE college sample – Standard run 2

For consistency, the following analysis is based on using organisational learning rather than organic culture. However, the run with organic culture produced slightly different results. The three independent variables together explain 27.6% of the variance in the dependent variable strategic innovative behaviour (25.4% after adjustment). Examining the three standardised coefficients, organisational learning makes the most contribution with a β of .269, followed by sector competition with a β of .264 and collaborative behaviour with a β of .189. All three coefficients are significant. Of the 27.6% variance explained by the three variables, 13.6% in total is unique to the them and 14.0% is shared in some way between them.

8.7.10 Finding 28 - FE college sample – Sequential run 1

Using the arguments expressed earlier in Section 8.7.4, income category has been chosen as one of the control variables. There is not a suitable quality related control variable for the FE college model.

A sequential multiple regression analysis was run, using income category in the first pass and the three independent variables from Model 8 in the second pass, with the following results.

Table 8.59 FE college sample – Sequential run 1 - results

	β	sr^2
Control variables		
Income category	-.155†	.024

Independent variables		
Collaborative behaviour	.189†	.033
Organisational learning	.258*	.058
Sector competition	.254**	.061
R^2	.300	
ΔR^2	.257	
Shared variance		.124
Adjusted R^2	.271	
F - pass 1	4.49*	
F – pass 2	10.29***	

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Preliminary checks for FE college sample – Sequential run 1

The preliminary checks are satisfactory.

Table 8.60 FE college sample – Sequential run 1 – preliminary checks

Test	Result
Ratio of cases to independent variables	Green's rule of thumb = 109. N = 102. This rule is broken marginally.
Outliers	i) Mahalanobis distance =12.83 which is less than the threshold of 18.47. ii) There is one case where the standardised residual is outside the range of -3.3 to +3.3. This case has been verified as genuine. Since it is marginally outside the range, it has been allowed to remain.
Multicollinearity and singularity	i) No inter-correlation of the four independent variables is > 0.6 – well below the 0.9 threshold. ii) All tolerance values > 0.1 and VIF values > 10. iii) Independent variable components do not overlap.
Normality, linearity and homoscedasticity	Visual inspection of the normal P-P plot shows points in an ascending straight line and visual inspection of the scatter plot shows a rectangular shape with more scores towards the 0 point.

Source=fieldwork/SPSS

Interpretation of results for FE college sample – Sequential run 1

The control variable income category was entered in step 1, explaining 4.3% of the variance in the dependent variable strategic innovative behaviour. This is significant. After entry of the three independent variables in step 2, an additional 25.7% is

explained. It can be concluded that the model established in Model 8 is mildly, positively and significantly influenced by income category.

8.7.11 Finding 29 - Summary and interpretation of multivariate results

The following table summarises the results of the three lean models, ie Whole sample Standard Run 2, University sample Standard Run 2, and FE College sample Standard Run 2.

Table 8.61 Summary of multivariate results of the Standard run lean models for each of the three samples

Variables	Whole sample	University sample	FE college sample
Collaborative behaviour	.176*	.311*	.189†
Organisational learning	.317***	.278*	.269*
Sector competition	.224**	.128	.264**
R^2	.261***	.273***	.276***
95% confidence interval	.15 to .38	.09 to .46	.13 to .42

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

Each of the lean models explains about 27% of the variance in the dependent variable. However, the contribution of each of the three coefficients is quite different for each sample. Collaborative behaviour makes the highest contribution in the university sample, but the lowest contribution in the FE college sample. On the other hand, sector competition makes the joint highest contribution in the FE college sample, but the lowest contribution in the university sample. Overall, it is organisational learning that makes the greatest contribution.

The 95% confidence intervals for R^2 have been calculated using the DanielSoper software. These confidence intervals are very wide, due to the relatively small samples and the relatively small effect sizes. This limits the reliability of the results.

In view of the comments in Section 8.6.2 concerning the questionable validity of using sector competition, which is a single item Likert variable, in a multivariate analysis, all

nine runs have been repeated excluding this variable. The results are shown in Table 8.62.

Table 8.62 Summary of multivariate results without incorporating sector competition

Variables	Whole sample	University sample	FE college sample
Collaborative behaviour	.193*	.341*	.176
Organisational learning	.333***	.255	.335*
R^2	.212***	.258***	.210***

* p<.05, **p<.01, ***p<.001
Source=fieldwork/SPSS

The results in Tables 8.61 and 8.62 are similar. As before, in the whole sample, organisational learning is the variable with the greatest influence and again collaborative behaviour has most influence in respect of the university sample and organisational learning has most influence for the FE college sample. Unsurprisingly, given there are only two independent variables, R^2 is lower.

The correlation matrix analysis (Section 8.6.2), the path model analysis (Section 8.6.4) and the multivariate analysis in this sub-section, are, of course, consistent as they are based on the same basic statistics. However, the differing approaches, and the fact that the multivariate analyses include university and FE college samples, as well as the whole sample, mean that each approach is able to demonstrate varied and nuanced detailed findings.

8.8 POSITIONING THE DEVELOPMENT OF INNOVATION CONCEPTS

8.8.1 Introduction

This section addresses the following research objective.

RO10: To examine where joint internal/ external collaboration is positioned as a source of innovation concepts, compared with mainly internally generated sources and mainly externally generated sources?

8.8.2 Finding 30 – Perception of where innovation concepts are developed

In the survey, for each of the three innovation clusters, respondents were asked to cite their institution's most significant innovation, and were then asked whether the concepts for this innovation were developed mainly in their institution, or in their institution in collaboration with others or mainly in other institutions.

The statistics based on these multiple-choice questions are set out in Table 8.63.

Table 8.63 Positioning innovation concept development

Sample ➔ Innovation cluster ↓	Whole sample			Universities			FE colleges			Chi-test
	In-house	Joint	Out of house	In-house	Joint	Out of house	In-house	Joint	Out of house	
Curriculum/ clients	60	37	3	67	29	4	56	42	2	0.28
Teaching and learning	78	19	3	87	11	2	73	24	3	0.13
Business organisation	65	33	2	80	18	2	57	41	2	0.02*
All innovation	68	30	2	78	19	3	62	36	2	

*A Pearson Chi-Square value of 0.05 or below shows that the university and FE college samples are statistically independent
Source=fieldwork

To summarise these figures, universities believe that their most significant innovations are developed in-house compared with joint collaboration in a ratio of about 4:1; and for FE colleges, the ratio is about 3:2. Both universities and FE colleges believe that hardly any significant innovation, that they adopt, is developed mainly in other institutions.

These are very polarised results and need careful interpretation. It is possible that the high in-house and low external figures depend on the interpretation of the word "develop". What the institutions may be meaning is that although many, perhaps the majority of, innovations emanate originally from fragments of ideas from outside sources, it is down to the institution itself to mould and tailor these ideas; and to justify,

consult and sell these ideas internally. In other words, it is often a long and winding road to achieve an organisational fit – and the gestation period may well be years. With such a scenario, institutions are more likely to tick the in-house box on simplistic multiple choice questions. On the other hand, if this is the correct interpretation, it is rather surprising, and illuminating for this research, that such a high % of innovations are regarded as collaborative.

Two specific patterns in the findings are worth commenting upon. Firstly, there is the difference between universities and FE colleges. Overall, and for each innovation cluster (although only for the business organisation cluster is the chi-squared test significant), universities believe that a higher proportion of innovation concepts are developed in-house than FE colleges so believe. This may be due to greater creativity, greater size/ income, greater insularity or some other reason. Secondly, the innovation cluster covering curriculum/ client changes has a lower in-house proportion than either of the other innovation clusters, for both universities and FE colleges. Perhaps, in this innovation cluster, there is more imitation between peers.

8.8.3 Finding 31 - Comparison of these results with other results in this chapter

Firstly, there are the univariate statistics for the main collaborator types, which give a high impression of collaborative behaviour (Section 8.4.5). Secondly, there are the covariate statistics between the main collaborator types and strategic innovative behaviour which are positive and significant (8.4.7). These figures are commensurate with the statistics in Table 8.61 which show overall that the concepts for 30% of innovations are developed collaboratively.

Secondly, there are the spectrum collaborator statistics in respect of sources of innovative ideas. The univariate statistics show that on average 40% of all collaborator types are an important source of innovative ideas and the covariate statistics give a mild, positive and significant correlation between this variable and innovative behaviour. These statistics seem to conflict with Table 8.63, which shows so little external development of concepts. The key to this conundrum is that the spectrum wording is “source of innovative ideas” whilst the Table 8.63 wording is “development of innovative concepts”. Sourcing and developing are two different processes and it is

very possible that many innovative ideas are sourced externally, but essentially developed internally.

Thirdly, the results in Section 8.5.2 clearly show that organisational learning, which takes place largely inside an organisation, is a far greater influence on strategic innovative behaviour, than institutional conforming, which is the implementation of innovations entirely developed elsewhere. This accords strongly with the statistics in Table 8.63.

8.9 SENSITIVITY OF RESULTS

8.9.1 Introduction

This exercise is designed to determine whether any college characteristic is an important moderating variable which could qualify any of the key findings. The means and correlations involving the three key clustered variables are tested: ie strategic innovative behaviour, collaborative behaviour and organisational learning. The FE college and university samples are tested separately. In each case, the samples are tested separately against five college characteristics: institutional category, geographical location, conurbation classification, quality assessment and income category.

In breaking each sample down, there may only be a small number of cases for each category of each characteristic. This stretches the robustness of any statistical findings. However, the data does provide a reasonable indication of sensitivity and does identify any potential anomalies. Pearson's r has been used to test for the sensitivity of correlation statistics and the independent samples t-test or one-way analysis of variance (ANOVA), as applicable, has been used to test for a significant difference between mean scores.

8.9.2 Correlation of collaborative behaviour with strategic innovative behaviour

Table 8.64 shows the results of testing the correlation of collaborative behaviour with strategic innovative behaviour for FE colleges and universities, respectively.

Table 8.64 Sensitivity of correlation between CB and SIB

College characteristics	Range of correlation coefficients for the categories in each college characteristic	
	Universities	FE colleges
University/ FE college sample	.45	.37
Institutional categorization	-.09 to .80	.32 to .46
Geographical location	.45 to .58	.33 to .47
Conurbation classification	.31 to .58	.22 to .37
Quality assessment	.44 to .55 (Guardian score) and .34 to .65 (Guardian added value)	.23 to .52
Income category	.15 to .49	.23 to .57

Source=fieldwork/SPSS

Each of the sets of scores apart from one is showing the same direction and is within a broadly similar range. This is despite the small number of cases in each chopped up categorization and the consequent likelihood of volatile results. The one problem area is that the range of coefficients for institutional categorization in the university sample is very wide. Drilling down to the individual categories, identifies the one rogue score to be in respect of Post 92 universities with a coefficient of -.09. The next lowest score for this characteristic is a respectable .21. A scatterplot of individual values appears to show a positive association, but does indicate two outliers. When these are removed, the score is closer to that expected.

8.9.3 Correlation of organisational learning with strategic innovative behaviour

Table 8.65 shows the results of testing the correlation of organisational learning with strategic innovative behaviour for FE colleges and universities, respectively.

Table 8.65 Sensitivity of correlation between OL and SIB

College characteristics	Range of correlation coefficients for the categories in each college characteristic	
	Universities	FE colleges
University/ FE college sample	.40	.44
Institutional categorisation	-.04 to .94	-.10 to .45
Geographical location	.44 to .46	.42 to .45
Conurbation classification	.32 to .54	.13 to .50
Quality assessment	.36 to .47 (Guardian score) and .31 to .48 (Guardian added value)	.39 to .50
Income category	.184 to .601	.42 to .47

Source=fieldwork/SPSS

Again, despite the likelihood of volatile results, each of the sets of scores, apart from two this time, is showing the same direction and is within a broadly similar range. And again, it is the range of coefficients for institutional categorization in the university sample that is very wide. Drilling down to the individual categories, identifies the rogue score again to be in respect of Post 92 universities with a coefficient of -.04. Again, the scatterplot of individual values appears to show a positive association, but indicates two outliers, one of which is the same as in the previous sub-section. When these outliers are removed, the score is closer to that expected. The other instance of anomalous scores is in respect of FE colleges belonging to the '157' group. This is a very small sample of eight colleges. The scatterplot shows no discernible pattern at all.

8.9.4 Comparison of means

A t-test or one-way analysis of ANOVA test, as appropriate, was conducted on each of the five institutional characteristics for the FE college and university samples, respectively. None of the results were significant, meaning that there is not a significant difference between the mean scores for each of the categories within each of the five characteristics for both universities and FE colleges. One can conclude that the statistical means are not sensitive to demographic variations.

8.9.5 Overall findings

Generally, these statistics show that the results presented in the core sections of this chapter hold up when tested for sensitivity in respect of the five college demographic characteristics. Two anomalies were found, in respect of post 92 universities and '157' group FE colleges. Feasible technical explanations are the small samples in each category and/ or outliers. No conceptual explanation is proposed.

8.10 SUMMARY OF FINDINGS

8.10.1 Summary of findings for each research objective.

RO1

Both universities and FE colleges have a high perception of the importance of their strategic innovative behaviour in their institutions. There is a spread of innovations across changes to curriculum/ client groups, changes to teaching and learning methods and changes to the business organisation. The most prevalent innovation concerns changes to the curriculum. Employer engagement and technology enhanced learning are innovations for both universities and FE colleges.

RO2

There is a moderate, positive and significant relationship between collaborative behaviour and strategic innovative behaviour for both universities and FE colleges. This holds for all innovation clusters and for mediating and moderating control variables.

RO3

Given the evidence of this research, the ranking of the relative influence of different collaborator types on strategic innovative behaviour is 1) employers, 2) professional networks and 3) peer groups.

RO6

Organisational learning has a moderate, positive and significant influence on strategic innovative behaviour, whereas institutional conforming has a mild, negative and

significant influence on strategic innovative behaviour. These relationships hold for both universities and for FE colleges, for all innovation clusters and for when controlled by mediating and moderating control variables.

RO7

Organisational learning has a moderate, positive and significant influence on collaborative behaviour, whereas institutional conforming has a mild, negative but not significant influence on collaborative behaviour. These relationships hold for both universities and FE colleges.

RQ9

Both the path analysis and multivariate analysis show that in respect of both universities and FE colleges, collaborative behaviour and organisational learning have a moderate, positive and significant influence on strategic innovative behaviour, but these influences interact and reduce when one is controlled for the other. Additionally, for FE colleges, sector competition moderates the influence on strategic innovative behaviour.

RQ10

Universities believe that their most significant innovations are developed in-house compared with joint collaboration in a ratio of about 4:1; and for FE colleges, the ratio is about 3:2. Both universities and FE colleges believe that hardly any significant innovation, that they adopt, is developed mainly by other institutions.

8.10.2 Detailed list of findings

Table 8.66 summarises the format and results of the 31 separate findings. Heading descriptions are as follows:

Findings are numbered 1-31 in the sequence in which they appear in this chapter.

Description is a brief specification of the finding subject matter.

The relevant Research Objective is specified.

The technique column identifies the method of analysing the data. U = univariate analysis; C = correlation analysis; PC = partial correlation analysis; MV-Std = multivariate analysis using the standard method; MV-Seq = multivariate analysis using the sequential method; Q = qualitative analysis based on the % occurrence of emergent themes; LA = logical analysis of several findings.

Models showing the relationships between variables are presented in the specified figures.

Results is a very brief summary of the results found in this chapter.

Finally, the relevant section in this chapter is referenced.

Abbreviations use are: U= university; FE = FE college; SIB = strategic innovative behaviour; CB = collaborative behaviour; OL = organisational learning; IC = institutional conforming; OC = organic culture; SC = strong sector competition.

Table 8.66 Summary of survey findings						
Finding	**Description**	**RO**	**Technique**	**Figure**	**Results**	**Section**
1	Perception of the importance of SIB	1	U		U mean = 5.0; FE mean = 5.3. Both are high.	8.3.2
1	Perception of the comparative importance of different innovation types	1	U		Range of means 5.1 – 5.4. All are high and similar.	8.3.2
2	Perception of the success of innovations	1	U		Overall mean = 5.6 = high. U and FE similar.	8.3.3
3	Examples of strategic innovations	1	Q		Complex – see Table 8.20	8.3.4
4	Correlation CB⇨SIB	2	C	8.2	Overall = .36***; U = .45***; FE = .37***	8.4.2
5	Check that CB⇨SIB holds for each innovation type	2	C	8.3	Holds, but strongest for cluster 'changes to educational delivery processes', for both U and FE.	8.4.3
6	Perception of importance of individual control variables	2	U		Three control variables have a mean higher than 5 for both U and FE – 'senior management originate most strategic innovation', 'strong sector competition' and 'frequent government policy changes' - in latter case, FE is higher than 6.	8.4.4
6	Correlation between individual control variables and SIB	2	C		Significant correlation between 'organic culture', 'senior management play dominant role in partnerships' and 'strong sector competition', but only for FE.	8.4.4
6	Check that CB⇨SIB holds for each control variable	2	PC	8.4	Holds for all control variables for both U and FE.	8.4.4
7	Perception of importance of each of the three prime collaborator types	3	U		Educational service providers and professional networks = high for both U and FE. Government agencies are neutral, but U significantly higher than FE.	8.4.5
8	Perception of importance of each of the nine spectrum collaborator types	3	U		Complex – refer to section	8.4.6

Table 8.66 Summary of survey findings						
Finding	**Description**	**RO**	**Technique**	**Figure**	**Results**	**Section**
9	Correlation between individual prime collaborator types and SIB	3	C	8.5	Moderately positive and significant for educational service providers, government agencies and professional networking for U, but only for latter for FE	8.4.7
10	Correlation between individual spectrum collaborator types and SIB	3	C	8.6	Complex – refer to section	8.4.8
11	Ranking of collaborator types ⇨SIB	3	LA		1 = Employers; 2 = Professional Networks; 3 = Peer Group Providers	8.4.9
12	Correlation OL⇨SIB	6	C	8.7	Overall = .43***; U = .40***; FE = .44***	8.5.2
12	Correlation IC ⇨SIB	6	C	8.7	Overall = -.23**; U = -.27*; FE = -.24*	8.5.2
12	Comparison between OL/IC ⇨SIB	6	LA		OL is moderately significantly positive for both U and FE. IC is weakly significantly negative for both U and FE.	8.5.2
13	Check that OL/IC ⇨SIB holds for each innovation cluster	6	C	8.8	Holds for OL. For IC, values are still negative but not significant.	8.5.3
14	Check that OL/IC ⇨SIB holds for each individual control variable	6	PC	8.9	Holds for all control variables.	8.5.4
15	Check that CB ⇨SIB holds when being controlled for OL	6	PC	8.10	OL overall reduces CB ⇨SIB from .36*** to .19*, mainly due to FE.	8.5.5
15	Check that CB ⇨SIB holds when being controlled for IC	6	PC	8.10	IC does not affect CB ⇨SIB for either U or FE.	8.5.5
16	Testing for interactions between CB, OL and OC		PC	8.11	Complex, but OL is the dominant variable and may be an antecedent of each of CB and OC.	8.5.6
17	Correlation OL ⇨ CB	7	C	8.12	Overall = .49***; U = .44***; FE = .57***	8.5.7
17	Correlation IC ⇨ CB	7	C	8.12	Overall = -.10; U = -.13; FE = -.06	8.5.7

Table 8.66 Summary of survey findings						
Finding	**Description**	**RO**	**Technique**	**Figure**	**Results**	**Section**
17	Comparison between OL/IC ⇨CB	7	LA	8.12	OL is moderately significantly positive overall (strongly positive for FE). IC is not significant for U or FE.	8.5.7
18	Correlation matrix and development of patterns and anomalies	9	C		Complex – refer to section	8.6.2
18	Choice of independent variables for path model and multivariate analyses	9	LA	8.13	The significant independent variables are: CB, OL, IC, OC and SC.	8.6.3
19	Path model – whole	9	LA/MV	8.14	Complex – refer to section	8.6.4
20	Multivariate analysis - whole sample – Standard run 1	9	MV-Std		CB, OL and SC are all significant independent variables.	8.7.2
21	Multivariate analysis - whole sample - Standard run 2	9	MV-Std		ß: OL = .32***; SC = .22**; CB = .18*. These three variables explain 26% of the variance.	8.7.3
22	Multivariate analysis - whole sample – Sequential run 1	9	MV-Seq		The control variable, organisational size, does not affect the result.	8.7.4
23	Multivariate analysis – universities - Standard run 1	9	MV-Std		CB and OL are the only significant independent variables.	8.7.5
24	Multivariate analysis – universities - Standard run 2	9	MV-Std		Run 1 using OL: ß: CB = .31*; OL = .28*; SC = .13. These three variables explain 27% of the variance. Run 2 using OC: ß: CB = .22*; OC = .31*; SC = .29*. These three variables explain 31% of the variance.	8.7.6
25	Multivariate analysis – universities – Sequential run 1	9	MV-Seq		The control variables, organisational size and Guardian Added Value, do not affect the result.	8.7.7
26	Multivariate analysis – FE colleges – Standard run 1	9	MV-Std		OC, SC and CB are all significant independent variables.	8.7.8
27	Multivariate analysis – FE colleges – Standard run 2	9	MV-Std		ß: OL = .31***; SC = .29***; CB = .22*. These three variables explain 31% of the variance.	8.7.9

Table 8.66 Summary of survey findings						
Finding	**Description**	**RO**	**Technique**	**Figure**	**Results**	**Section**
28	Multivariate analysis – FE colleges - Run 3	9	MV-Seq		The control variable, organisational size, is significant and affects the variance by 4%.	8.7.10
29	Summary/ interpretation of MV results	9	LA		Complex – refer to section	8.7.11
30	Perception of where innovation concepts are developed	10	U		Overall results for where innovation concepts are developed are: mainly in-house = 68%; joint collaboration = 30%; mainly external institutions = 2%. U is more polarized than FE.	8.8.2
31	Comparison of Finding 30 with other survey results	10	LA		Complex – refer to section	8.8.3

(Source=Author)

CHAPTER NINE

CASE STUDY FINDINGS

9.1 INTRODUCTION

9.1.1 Research objectives

The research objectives and research models are developed in Chapter Five – Research Specification. The research objectives specific to the case study are shown below.

RO1. To explore the nature of strategic innovative behaviour.

RO4. To explore how and why collaborative behaviour influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

RO5. To explore how and why each collaborator type influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

RO8. To explore which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why.

R10. To examine where is collaboration positioned in the development of concepts for organisational innovation, compared with mainly internally generated sources and mainly externally generated sources, respectively.

9.1.2 Chapter contents

Research Objective 1 is addressed in Section 9.2. As a preamble to considering external collaboration, the role of internal collaboration is explored in Section 9.3. Research Objective 4 and Research Objective 5 are addressed in Section 9.4. As a preamble to considering organisational learning versus institutional conforming, the nature of the innovation journey is introduced in Section 9.5. Research Objective 8 is addressed in Section 9.6 and Research Objective 10 is addressed in Section 9.7.

9.1.3 Participating institutions and interviewees

The approach to designing, conducting and analysing this case study is described in Section 7.5. There are five institutions – three universities and two FE colleges and four interviewees in each institution. Each of the five institutions had responded to the survey that had been conducted earlier in this research.

Two of the universities are post 1992 and one is post 1962. One university is from the north, one from the midlands and one from the south. All three universities are noted for employer engagement, widening participation and value added performance. All three are hybrid universities in that they focus on teaching and learning and applied research. All three have a substantial international presence.

The two FE colleges are large general FE colleges with a track record of good or outstanding Ofsted grading. One FE college is from the north and the other is from the midlands. Both have a substantial under 19 presence, substantial work based learning presence and substantial HE presence.

An analysis of interviewee roles is shown in Table 9.1.

Table 9.1 Analysis of case study interviewee roles

Focus of interviews	Universities	FE colleges
General strategic innovation	1 x deputy vice-chancellor 1 x pro vice-chancellor, who was also a dean 2 x deans 1 x director of academic services 1 x director of teaching and learning	1 x deputy principal 1 x vice principal for HE 2 x faculty heads
Employer engagement innovation	3 x pro vice-chancellors	2 x business development directors
Technology enhanced learning innovation	1 x associate dean 1 x director of teaching & learning 1 x assistant director of teaching & learning	2 x heads of teaching & learning

Source=Author

In order to ensure anonymity, universities and interviewees are given symbolic labels in this case study. The universities are labelled UA, UB and UC, respectively. The FE colleges are labelled FA and FB, respectively. Interviewees are labelled with their institution label followed by a number 1-4, relating to the sequence in which they were interviewed – not their job title or the innovation category to which they were speaking.

The interviews took place between August 2012 and February 2013.

9.2 THE NATURE OF STRATEGIC INNOVATIVE BEHAVIOUR

9.2.1 Introduction

This section specifically addresses the following research objective:

RO1: To explore the nature of strategic innovative behaviour.

Each interviewee was asked to provide up to two or three innovations: some interviewees chose to focus on only one innovation, while others mentioned several during the course of their interview. Interviewees were asked for "strategic"

innovations – ie ones that had a significant impact on the institution and were likely to be discussed and monitored by the senior management team. Interviewees understood the exercise well and many had prepared their selection of innovations in advance.

The innovations are vehicles to explore collaborative behaviour and organisational learning/ institutional conforming behaviours. The rich descriptions give a good idea of the context so that readers can assess how well the findings might be transferable to their own or other contexts. Innovations have been clustered according to 10 innovation types that emerged during analysis. A list of the individual innovations and the associated innovation types is depicted in Table 9.2. This list contains only those innovations used in the various analyses in this chapter. Other innovations were discussed during the interviews and are mentioned in passing in this chapter.

This section consists of a narrative description of each innovation type, together with two separate analyses. The first analysis maps innovation type against a range of generic corporate aims and the second analysis maps innovation type against organisational diffusion/ infusion and the scale of impact.

The innovations provide a good indication of the current visions, priorities and range and scale of initiatives undertaken by the set of institutions participating in this study. The scale is impressive, and this can be confirmed by perusing the "about us" blurb published on institutional web sites, particularly by the universities, which typically contain details of a plethora of innovations and initiatives. The list of innovations in this thesis does not purport to be exhaustive of the hundreds of possible innovations or comprehensive in terms of innovation types. Indeed, there is some bias in the range of innovations due to the bias in the selection of institutions and interviewees. An example of this is the range of innovations in this study related to employer engagement. This particular bias is justified because of the predominance of employer engagement innovations cited in the free form sections of the survey. It is also noteworthy that the interviewees nominated by the universities to speak to employer engagement were three pro vice-chancellors and that the innovations they cited have been highly significant in achieving their institution's corporate objectives.

Table 9.2 Innovations clustered according to innovation types

Innovation types	Universities	FE colleges
Create institutional vision	• Civic university (UA) • Business facing university (UC)	
Gain government approval for a change in mission		• Foundation degree awarding powers (FB)
Set up new institutions	• University technical college (UB)	• Academy (FB)
Set up new centres	• Clinical diagnostic centre (UB) • SME centres x 2 (UC)	• Land based centre (F1) • HE centre (FB)
Establish vocational programmes	• Vocational degrees and short courses for engineering employer (UA) • Foundation degrees for utility employers (UB) • Entrepreneurial programme for SMEs (UB) • Teacher training reform (UC)	• Vocational degrees, short courses and apprenticeships for engineering and retail employers (FA) • Vocational degrees and apprenticeships for logistic employer (FB)
Develop teaching practices	• Staff teaching certificate (UB) • Student feedback (UB)	• Staff coaching (FB)
Implement technology enhanced learning	• First generation of VLE (UA,UC) • Second generation of VLE (UA) • Electronic voting systems (UC) • Lecture video capture (UB)	• First generation of VLE (FA,FB) • Electronic individual learning plans (FA)
Develop partnerships	• Automotive partnership (UC) • Review of international collaborative provision (UA) • International teacher training project (UC)	
Develop estate	• Twin campus development (UA)	
Restructure organisation		• Two mergers (FA)

Source=Author

The innovations have been colour coded according to the innovation subject matter of the associated interviews: blue for general strategic innovation, green for employer engagement innovation and red for technology enhanced learning innovation. It is notable that the two institutional vision innovations were part of the employer engagement interviews and were with senior pro vice-chancellors.

9.2.2 Descriptions of Innovation Types

9.2.2.1 Create institutional vision

Although it was anticipated that interviewees would discuss two or three specific strategically important innovations each, several interviewees discussed the bigger picture of innovations in the context of an institutional vision. Specifically, in one university, two interviewees mentioned at length the concept of their institution being a business facing university and, in another university, two interviewees mentioned at length the concept of their institution being a civic university. The focus here is on the specific interpretations presented by the relevant interviewees in this study.

The term business facing university became widely used following the Leitch Report and the challenge for universities to be "the engine of wealth creation". The following quotes give examples of the practical effects:

"We have a dedicated commercial unit, driving income and commercial work, knowledge exploitation and student facing support such as getting them placements and jobs - embedding enterprise becomes a virtuous circle" (UC2)

"Every school has an industrial advisory group, so that our learning and teaching is very much connected to business." (UC2)

The term civic university includes being business facing, but emphasises the university's role in regional regeneration and a wider cultural role.

"We are making a fundamental contribution to the economic, social and cultural life of the city and the wider region." (UA1)

Cited examples of this contribution included: a fundamental role in supporting an international engineering company to expand production; instigating and leading the development of a substantial software industry in the city; and being asked by the business community to establish an enterprise and growth hub.

It is interesting that a similar philosophy of openness is espoused in both visions. Example quotes are:

"Business facing is about more than being commercial.... it is how a programme has brought the outside in and the inside out." (UC2)

"Sometimes universities can feel a bit intimidating.....so we are a porous institution, where knowledge and information can flow in and out and people can flow in and out." (UA1)

The third university, while not specifically mentioning a civic or business facing vision in the interviews, nevertheless has community engagement as one of the three elements of its emblem and has a similar open philosophy.

"We collaborate with local agencies for economic regional regeneration....and through our knowledge transfer partnerships....and our engagement with employers in the design of all our programmes ....and our students have placements in .....and we want our graduates to remain in [XYZ region]" (UB1)

Neither of the two FE colleges stated an explicit vision in the interviews. However, their statements indicated that both were community colleges and had become very business oriented in the sense that rather than bemoan constantly changing government priorities, they had become quick to seize upon these as opportunities, particularly in respect of full cost recovery courses.

"We are a leading college on the 14+ agenda, a national player in the delivery of work based learning and apprenticeships and we are pushing the boundaries on the acquisition of private training providers." (FB1)

In particular, both institutions have strongly embraced employer engagement with a very impressive track record in apprenticeships and degree level bespoke programmes. A typical comment from one of the FE colleges was:

"We have to morph to continually changing government priorities and funding streams .... so that determines how we work with employers .... we have to be innovative and competitive in what we offer in order to attract new business and keep our existing business because there is always a competitor on the doorstep." (FA4)

Further examples of their quick response to government initiatives is that one of the colleges had already set up an academy and both have set up studio schools. In this regard, they were both pioneers.

9.2.2.2 Gain government approval for a change in mission

The mission of FE colleges is constrained by government regulations. A recent regulation change has enabled FE colleges to expand their mission as they can now apply to have the power to award foundation degrees. This has significant benefits to an FE college in terms of efficiency, responsiveness and reputation. Hitherto, FE colleges have had to have their degree courses validated by a partner university. This will continue to be the case for full and higher degrees.

9.2.2.3 Set up new institutions

In recent years, there have been several versions of "academies", which are schools for pupils between ages 11-18 and which are funded directly by the government rather than by the local council. One of the FE colleges in this case study was persuaded to take over a failing local secondary school, transferring its existing successful system of values and setting up a curriculum tailored to local needs.

Two more specific versions of secondary school academies have recently been introduced – university technical colleges (UTCs) and studio schools. Both versions are vocationally oriented and cater for 14-19 year olds. UTCs are large academies that are designed to produce the technologists and engineers of the future. Higher education is expected as a subsequent destination. They must be sponsored by a university and an employer and often are also sponsored by one or more FE colleges. Studio schools are much smaller academies with the aim of enrolling students with a more practical than

academic leaning. There is an emphasis on gaining employability skills through work experience, which is embedded in the curriculum.

Pioneering universities and FE colleges are setting up these new institutions, often with the direct encouragement of the government. At the time of the interviews in 2012, of the three universities being studied, one had already set up a UTC and another was planning for one. Of the two FE colleges in the study, one had already set up an old style academy, was setting up a studio school and was considering participating in the setting up of a UTC. The other FE college had already set up a studio school.

Participation by a university in UTCs is crucial.

"There are bridges and ladders – to be successful at an advanced level in technical subjects, you do need to be good at maths, physics and chemistry." (UB1)

And often, an institution is leaned on by the government.

"The Department [of Education] was very keen to get an outstanding FE college .....we had this glowing Ofsted inspection.....to take some leadership in the community around the compulsory education system.....to make a difference to the city." (FB1)

9.2.2.4 Set up new centres

There is a growing trend for both FE colleges and universities to establish dedicated centres focussed on niche areas of expertise or specific client groups. Several types of centre were mentioned in the interviews.

Firstly, there are dedicated curriculum centres. An example from one of the universities is a significant investment in a new science complex:

"which is intended to make a statement in terms of buildings and facilities to students, staff and employers about the quality and prestige of education and services on offer". (UA1)

An example from one of the FE colleges is the complete redesign, refurbishment and reorganisation of a dedicated land based centre. Another example from FE is the building of a centre dedicated to the training of construction skills.

Secondly, there are dedicated research centres. Examples from one of the universities is the building of a world class research and clinical diagnostic facility and a centre specialising in bio-energy research. The key asset is the institution's research tradition and current staff expertise.

Thirdly, there are small business centres. These provide space, facilities, access to expertise and networking opportunities for start-up and small companies. Examples are a centre specialising in bio-science and another providing facilities for general businesses. These centres include spin-ins from the host university and spin-outs from other universities.

Fourthly, there are centres focussed on specific client groups. Examples, all from the FE sector, include the setting up of a dedicated HE centre; 6th form centres for 16-18 year olds; and a dedicated centre for 14-16 year olds.

9.2.2.5 Establish vocational programmes

A core function of universities and FE colleges is to update their portfolio of educational programmes in response to changes in employment trends and educational fashion. Several new programmes were mentioned during the interviews and it was notable that all of them were vocationally related. Several trends were noticeable in the interviews.

Firstly, there has been a significant development of bespoke degrees tailored to the requirements of a single employer or a small sub-set of employers in the same sector. These bespoke degrees are very much co-developed by the university and employer in partnership. They usually include a significant element of work based learning on the employer's site and this may include competence based assessment. The introduction of foundation degrees has provided a major impetus. All five of the institutions being

studied have developed bespoke degrees, including the FE colleges. Examples of programmes mentioned include engineering, logistics and retail.

Also mentioned in the interviews were several ad hoc programmes which were designed to solve a specific employer related problem, and which were run just once or a few times. These could be either short courses or degree programmes. Examples include: an engineering company having difficulty in retaining new graduates and the design of a bespoke master's programme which resolved this problem; a programme of short courses for hundreds of engineers to update their digital tools skills; and a short course designed to up-skill a thousand employees in general work skills during a forced shut down.

Another trend is the establishment of educational pathways.

"We try to give students a complete opportunity – so they could come in on a level 1 course and progress right up to a full degree with us – if they want to do that". (FA1)

A fourth trend, mainly applicable to FE colleges, is the huge increase in apprenticeships. As at 2012, they were fully funded for 16-18 year olds "funding is very much a bottomless pit" (FA4) and co-funded for older students working for SMEs. FE colleges have had to be quick on their feet to re-organise their operational provision and sales approach and to take advantage of this major government policy initiative. Some of this provision is substantial in scale:

"We work with [redacted] across the whole of England – we are their main supplier of FE courses and that includes 400 apprenticeships in their [redacted]." (FA1)

The final trend has been the growth of training for SME entrepreneurs. An example is the sponsorship by a large [redacted] of a programme of business training, run by selected universities, for SME executives just at the time their businesses are at the cusp of taking off. As well as training in business skills, these programmes provide mentoring and significant networking opportunities.

Very small businesses have always represented a problem for educational institutions. The government wants them included in training programmes because they are seen as the seeds of future growth. However, they rarely have the money or time to participate in programmes. One university has solved this conundrum by offering these small businesses support in the recruitment and mentoring of new staff – a task which they often find difficult.

"Perhaps they are employing nobody, and they want to employ one person, or they would love a placement student, but they don't know anything about mentoring." (UC2)

Finally, two interviewees mentioned the recent government reform of teacher training. This is not a trend, but a one-off significant change in a traditional educational programme. It has meant relevant universities completely revising their teacher training programmes and their relationships with their partner schools who provide the work based experience.

"The government is making the biggest changes in teacher training that have been made in a generation." (UC4)

9.2.2.6 Enhance teaching and learning practice

All universities and colleges aim to improve continually on their methods and standards of learning and teaching and there is usually at least one central unit whose aim it is to facilitate this improvement. Several examples were mentioned in the interviews.

Most universities and some FE colleges are quite large organisations. The dissemination of best practice is not a trivial matter. All five of the institutions in this study have developed a central unit responsible for disseminating best practice, often through designated lecturers/ tutors in each curriculum area. Such units often have the responsibility for VLE best practice.

A second example, is that it is now becoming the norm that lecturers in universities and FE colleges have a teaching qualification. One of the universities in this study

completely revamped their staff teaching certificate to reflect their vision that learning, and teaching should be research led.

The third example, concerns a long standing grievance, highlighted in a National Student Survey, regarding the inadequate feedback, in terms of content and timeliness, given to students with regard to their assignments. This applies to FE colleges as well as universities. One of the universities had undertaken a devolved exercise to develop an appropriate framework of feedback guidelines for their lecturers.

The final example concerns improving student employability. Consequent upon the Leitch Report, and more general pronouncements by employers' organisations about the need to raise basic skills levels, there has been a focus in the sector on raising the "employability" of students, ie in ensuring they have the basic skills to participate in work and that they have an awareness of what working life is all about. For the more able students, it is also beneficial for them to have some practical working experience in their chosen field and/or for them to have an awareness of what being entrepreneurial means.

Placements have always been compulsory for some jobs such as nursing and teaching and some engineering and language degrees, amongst others, have often had a "sandwich" year. However, it is now becoming the aim to build at least some relevant work experience into all courses, although this is far from being realised yet. Research has shown that placements have a significant and positive impact on degree classification results.

"We have employability embedded in our curricula." (UC2)

"Working very closely with local employers, what we try to do is ensure they have a period of time they spend in employment that's monitored closely – it's to give them a taste of real life and obviously all the demands that sit with that." (FA1)

"We have innovated around the teaching and learning agenda, the student support agenda, around employability for our students - students get internment opportunities, placement opportunities, employment opportunities – the academic programmes are

underpinned by the knowledge and relationships that we have got with external partners that are brought into the academic life of the institution, so it is not just esoteric and abstract, it is very real for the students." (UA1)

A different kind of initiative that was mentioned in all five institutions is some form of student entrepreneurial scheme. Selected students are given support in terms of training, mentoring, office facilities and, sometimes, finance to help them start up their own business. The aim is to develop entrepreneurial awareness and skills and perhaps even to sow the seeds of a successful business. A further development of these ideas is to match a skilled graduate with a relevant SME to work as a paid consultant on a specific project. In some cases, these schemes have been supported by European funds.

9.2.2.7 Implement technology enhanced learning (TEL)

Technology enhanced learning has been arguably the most important new influence on learning and teaching over the last decade. TEL includes several technologies, although the main one, at least currently, is a virtual learning environment (VLE) platform. These emerged in universities around 2000 and their use is now mature, whereas they emerged in FE colleges around 2006 and only now are they beginning to be used fully. In, say 2009, students from schools entering FE colleges and universities, would not have had any TEL expectations, but by 2012 this had changed markedly. In the case of universities, a VLE is also the basis for the development of distance learning programmes.

The most common platforms are the proprietary Blackboard and the open Moodle. Both are popular in universities, while only Moodle has been adopted in FE colleges, because of the lower costs. In the three universities that were studied in this research, one uses Blackboard, one uses another proprietary platform and the other uses software it had developed in-house. Both FE colleges use Moodle. The basic functions of a VLE are to: support course specification, operation and management; provide a database of content; facilitate specific course tasks, including group tasks; provide a repository for student work; support student progress tracking; and provide an interactive forum. Institutions aim to embed the technology in the learning experience – so called "blended learning".

"What we are trying to do is to embed it – e-learning kind of separates it out from hind legs learning – face to face learning – what we are looking for is a blend of the two things" (UA1)

As at 2012, the feeling of interviewees was that technology enhanced learning was merely supporting existing learning approaches, whilst it had the potential for transforming them.

A VLE is often the platform for independent learning. In two universities, building such a platform to reach new markets was a strategic target.

"The use of learning technologies to support fully independent learning.....it's a programme of study that they take at a distance – but it doesn't have to be at a distance actually – but independently." (UC1)

In this study, other examples of technology enhanced learning being adopted, or at least being trialled, by universities are the video capture of lessons, electronic voting systems and the use of mobile devices. Examples of technology enhanced learning being adopted by FE colleges are different and include electronic individual lesson plans and e-portfolios.

Generally, universities have far more funds per student than have FE colleges and so they are able to invest relatively more in infrastructure such as technology enhanced learning.

"FE colleges have to be efficient otherwise they would go out of business – they don't have the same money to invest that we have." (UA1)

9.2.2.8 Develop partnerships

In the interviews, two broad types of partnerships emerged.

Universities typically call the first type "collaborative provision". This is where the university provides the framework and content of courses, but where the delivery is made by another party. Usually, the university accredits the courses and is responsible for quality assurance. Within the UK, the usual model is a university accrediting the delivery of HE courses by an FE college. On a similar basis, FE colleges may accredit the delivery of FE courses by private training providers. Due to the reputation of UK educational institutions, there is also a substantial market in international collaborative provision, where a UK university is in partnership with a training provider in a foreign country.

The second type of partnership, is an informal or formal partnership, between several interested parties, who come together for a specific aim. Examples mentioned in this study included a university leading local agencies and employers to foster the development of a local software hub and another university leading local agencies, employers and specialist consultancies in the exploration and development of futuristic automotive opportunities.

9.2.2.9 Develop estate

Over the past 20 years, there has been a huge capital investment in campus development and the refurbishment of individual buildings. Capital has been provided mainly by the UK government but there has also been considerable European regional funds.

Two examples were mentioned in this study. One was the episodic development over several years of twin campuses by one of the universities. The other was the redevelopment for educational purposes of historic town centre buildings by one of the FE colleges. Both these developments were considered hugely successful in enhancing the identity and prestige, as well as the efficiency and effectiveness, of these institutions.

"There has been the very judicious manoeuvring of the existing estate as it was a decade ago and getting rid of peripheral buildings and concentrating on two

campuses.... addressing shifts in the portfolio which were associated to a large extent with the shifts in the socio-economic map of the region… has been extraordinarily beneficial.... it says modern, civic, in and of its place - it's very powerful and attractive to students." (UA3)

"We took a very old building that was central to the city and a significant part of the city's history and have brought it into the modern day to become a real hub of the city again." (FA2)

9.2.2.10 Re-structure organisation

There are several reasons why an organisation implements a partial or complete re-organisation. The main instance described in this study is where one of the FE colleges merged on two separate occasions with other colleges. In fact, both instances were effectively take-overs, encouraged by local and central authorities. The motivation was to spread the financial acumen and curriculum quality performance of the prime college to failed colleges and to gain efficiencies through the elimination of duplicate courses.

Other examples mentioned during the interviews included: the restructuring necessitated by the new institutions and new centres; setting up a central unit for the co-ordination of employer engagement (a re-organisation common to all five institutions); and taking over a private training provider.

9.2.3 Analyses based on innovation types

An important part of case study analysis is spotting interesting relationships between conceptual categories in the data. Two such relationships are presented concerning innovation types.

9.2.3.1 Analysis of innovation types by corporate aims

The first emergent relationship is between innovation types and generic corporate aims. This provides an insight into the strategic importance and purpose of innovation in general and of specific innovation types. Table 9.3 maps the 10 innovation types

against 7 generic corporate aims. This table reflects the findings from these specific innovations only. It does not reflect all the mappings that could theoretically occur. For example, there are gaps related to the aims of raising the research profile and developing international student business because the focus of this study leant more to learning and teaching practice.

With regard to headings, a change in mission is a change in the raison d'etre of the institution. The next three columns are the conventional output measures of tertiary educational institutions – financial, student experience and research, respectively. The final three columns represent relatively new tertiary sector aims.

9.2.3.2 Analysis of innovation types by organisational impact

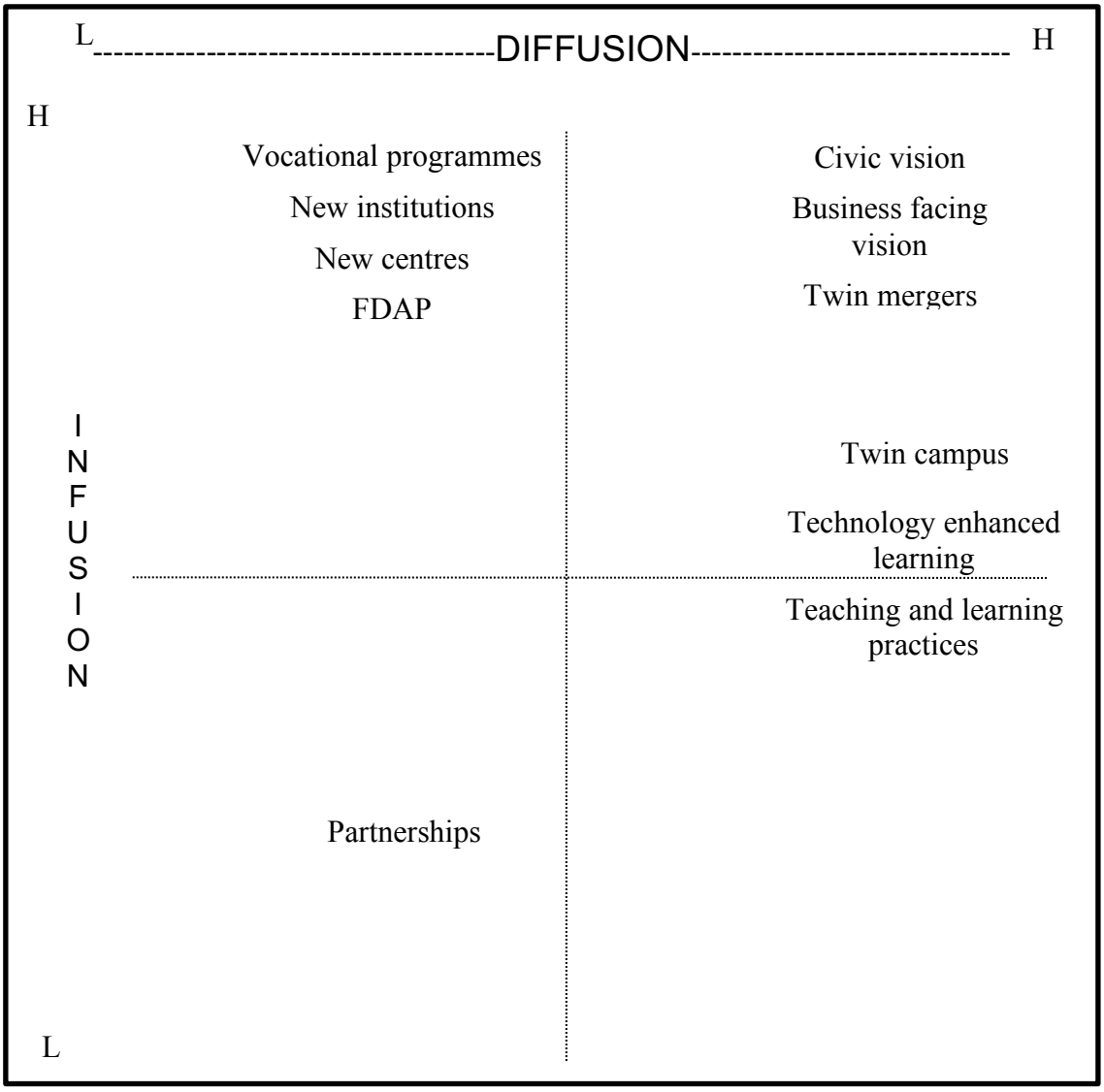
The second emergent relationship is between innovation type and its organisational impact on, and organisational importance to, the institution. Figure 9.1.maps the innovation types against a diffusion/ infusion grid. Diffusion is the typical spread of an innovation throughout an institution's various departments and infusion is the level of impact on business operations through that innovation. It can be seen that the two changes in vision and the twin mergers had a high diffusion and high infusion. The new vocational programmes, new institutions, new centres and FDAP had a high infusion, but only in parts of an institution. The development of teaching and learning practice, new technologies and the estate had a high diffusion, but only a moderate infusion. Finally, the development of partnerships involved only a modest diffusion and infusion.

Table 9.3 Innovation types mapped against generic corporate aims

Generic corporate aims → Innovation type ↓	Expand mission	Raise income/ improve efficiency	Improve student experience	Raise applied research profile	Develop employer engagement	Develop community presence	Develop international student business
Create vision	✓				✓	✓	
Gain change in mission	✓	✓					
Set up new institutions	✓	✓	✓		✓	✓	
Set up new centres		✓	✓	✓	✓	✓	
Establish vocational programmes		✓	✓		✓		
Develop teaching and learning practices			✓				
Implement technology enhanced learning		✓	✓				✓
Develop partnerships		✓		✓	✓	✓	✓
Develop estate		✓	✓			✓	
Restructure organisation			✓			✓	

Source=Author

Figure 9.1 Innovation type mapped against diffusion and infusion impact



(Source=Author)

9.3. INTERNAL COLLABORATION AND STRATEGIC INNOVATIVE BEHAVIOUR

9.3.1 Introduction

Internal organisational factors play an important role in strategic innovative behaviour. They are explored here to provide a context for the innovative and collaborative behaviour described in this case study. Two organisational factors in particular emerged - firstly, the role of leadership and institutional culture; and, secondly, the role of co-ordinating mechanisms.

9.3.2 Leadership and infused culture

Upon reflection during the interviews, it became apparent that many of the interviewees that had been selected for this research were enthusiastic innovators who had themselves been inspired by visionary and charismatic leadership. The question was whether this spirit of innovation was "culturally infused" throughout the organisation or whether it just existed in pockets at the top.

The two FE colleges were visited first, and it was these visits that raised the thought that leadership and culture may have an important role in an institution's innovative behaviour. The principal of the first FE college to be visited was clearly charismatic, had been influential in the local community and was hugely admired by the senior management team: this was reinforced by an equally charismatic and admired deputy. All four interviewees were knowledgeable, articulate and, above all, extremely enthusiastic with an obvious "can do" business oriented attitude – willing to make the best of whatever challenges they faced – be it changes in government policy, new organisational structures following a merger or the changing demographics and competitive landscape.

"We are a very innovative organisation – the principal is very innovative – he is always looking for fresh challenges and for ways to improve the College". (FA1)

The principal of the second FE college was very similar in being charismatic, influential in the community and greatly admired by the senior management team with a similarly graced deputy. What seemed to bind this college together was their well-rehearsed system of values coupled with their desire to do their best for their students in what is a deprived part of the country.

"We have a really strong overriding commitment and it is not something you can pay for or buy - it comes from the inside of people doesn't it – it's about your values." (FB2)

The first university to be visited also had a very charismatic, influential and admired vice-chancellor who had developed the concept of a civic university and developed external relationships and internal mechanisms to make it work. One of the interviewees, a pro vice-chancellor, was possibly the most articulate and passionate of all the 20 interviewees in this research and was very impressive in illustrating the university's vision with concrete examples.

"Universities have a kind of personality and a lot of that personality is led from the top – the vice chancellor and the executive team and all of that – but it is also informed by the university structure and its place and its demographic and its student body." (UA1)

The other three interviewees in this university were clearly competent and committed professionals but rather mixed with regard to their passion for collaboration and innovation. It was this contrast that gave the thought that universities, which are much larger and more internally autonomous than FE colleges, may not have such an infused culture, but that good innovative behaviour might exist in pockets.

This situation was repeated in the second university, also led by a visionary vice-chancellor, where one of the interviewees, a pro vice-chancellor, was extremely articulate and a passionate innovator but where again the other three interviewees were also clearly competent and committed but somewhat mixed in their passion for collaboration and innovation.

"I think we are a very decentralised organisation ……and I think we have a tremendous amount of innovation in all pockets." (UA1)

" (the vice-chancellor) has been absolutely pivotal in freeing up people who want to breathe – but if some don't – no, it [innovation] probably just gets left." (UB3)

However, the third university made it apparent that cultural infusion of innovative behaviour is possible. This university had gone through several years of change management to introduce a business facing philosophy throughout the organisation – where every course has to include relevant community / commercial facing elements. All four interviewees demonstrated this philosophy and were convincing that it would be found in all of their schools and at all levels.

"(business facing) is part of our DNA." (UC2)

"Enterprise infuses everything we do." (UC2)

9.3.3 Co-ordinating mechanisms

Most universities and many FE colleges are fairly large organisations. Nowadays, they have robust systems and structures for budgetary planning and quality assurance and the agendas for meetings related to these systems necessarily include items related to contemporary innovation activities. With major strategic cross-cutting innovations, additional co-ordinating mechanisms are needed. Taking technology enhanced learning as an example, there have been a series of innovations, spanning many years, in all five institutions. All five institutions have some form of "learning technologies group" (or some such similar name) which is run by a central co-ordinating unit with representatives from each curriculum area. These groups played a pivotal role in the selection and implementation of the technologies in this case study. The representatives are crucially important. Often, they are called champions and their role is to provide feedback from their curriculum area to the group and key decision makers and to cascade technical and practical know-how back to their curriculum area and to generally enthuse their area in making full use of and deriving maximum benefit from any new innovation. In some cases, this role covers the wider remit of all learning and

teaching changes and sometimes the teaching practice role is a separate co-ordinating group with a separate champion.

Another area where change is led by central teams is employer engagement. All five institutions have a dedicated employer engagement unit who are responsible for developing relationships, and winning new business, with key employers. This necessarily involves close collaboration between the employer engagement unit and the curriculum areas who have to deliver the programmes and services.

Two other instances of facilitating collaborative behaviour were discussed in the interviews. One of the innovations in this study is the introduction of a new staff certificate. The associated training specifically includes devices for encouraging the mixing of staff from different schools and this has led to an increased level of cross-fertilisation between the schools, for example in research bids. Another university includes specific targets for collegiate behaviour, for all faculty and curriculum managers, and these targets are subject to periodic appraisal.

The above examples relate to the co-ordination of staff. Additionally, all five institutions play great heed to listening to the "student voice", especially in changes to learning and teaching practice. This is achieved through student committees, surveys and focus groups.

"Listening to the learner voice is extremely important to us - it keeps us ahead of the game." (FA3)

"The student voice is very big for us.....this is an expectation from Ofsted but equally at the end of the day they are our customers and if we are not serving their needs ....they are at the heart of what we do and so they have to come first." (FA2)

9.4 COLLABORATION AND ITS ROLE IN INNOVATION

9.4.1 Introduction

This section specifically addresses the following research Objectives:

RO4: To explore how and why collaborative behaviour influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

and

RO8: To explore how and why each collaborator type influences decision making in the pursuit of strategic innovative behaviour during the innovation journey.

This section describes and analyses the role of external collaboration in the innovations chosen by the interviewees. Seven types of collaborator emerged during the interviews. This does not purport to be a definitive analysis of these collaborator types. No data from other sources has been added to the interview statements.

Box 9.1 List of collaborator types

The government, which includes ministerial and departmental influences, plus the core central agencies responsible for funding and quality assurance.
Other government agencies, which includes relationships with national agencies with a remit to serve the TES in a technical capacity and relationships with local agencies such as councils and development/ enterprise organisations.
Peer group educational institutions, which includes: competitors; formal partners for the purposes of making bids, developments or operations; regional and national associations; specific sector functional groups; and ad hoc networking.
Other educational partners, which for universities mainly means FE colleges (and vice versa) and for both universities and FE colleges means secondary schools and collaborative provision, both public and private and both UK based and foreign.
Employers, which includes relationships with large employers and SMEs and contact with employer associations, particularly sector skills councils.
Professional networking, which includes all forms of networking in a personal capacity with organisations and individuals.
Suppliers, which in this study includes the supply of educational software and building services.

Source=Author

Two broad types of contact with external players emerged. The author has labelled the first type as purposive. This is where there is an important task, the fulfilment of which requires the co-operation of specific players. This task can be routine, eg liaison with collaborative provision providers or government funding agencies, or can be developmental, eg the setting up of a new institution or the development of a bespoke programme for an employer. The author has labelled the second type as eclectic. This is where external players are contacted at general purpose events, such as functional group meetings and conferences - where innovations are sometimes triggered by awareness raising or the fortuitous juxtaposition of need and opportunity.

9.4.2 The role of each collaborator type in strategic innovation

9.4.2.1 The role of central government and core funding and regulatory agencies

The role of government is hugely important, particularly in setting educational policy and instigating/ funding new initiatives. Regarding the innovations in this study, they played a key role in spurring on the new visions and the change in mission; they instigated, funded and cajoled leading institutions into setting up new institutions; they were responsible for the drive to employer engagement and specifically the co-development of employer based full cost recovery courses, the involvement of sector skills councils in programme content design and the increase in apprenticeships; they have actively encouraged mergers (takeovers of failing institutions by outstanding ones) and collaborative working through insisting on joint bids for research grants and educational initiatives; and through funding the various educational agencies, they have encouraged improvements in teaching practice and the original take-up of VLEs.

Administration of government priorities through regulation

The Quality Assurance Agency reviews institutions providing higher education, both universities and FE colleges, on a periodic basis. The fear of receiving a no confidence outcome in collaborative provision was the trigger for one institution in this study to completely overhaul their quality assurance processes. Another role of the Quality Assurance Agency is to recommend to the government which institutions should have degree awarding powers. One FE college being interviewed is currently going through

the new process, expected to take over two years, of being allowed to award foundation degrees. Ofsted plays a similar role for further education in FE colleges and teacher training in universities. One interviewee said they use Ofsted reports as indications of best practice and said they would try and visit outstanding colleges to see best practice in action. An Ofsted visit is often regarded with some trepidation by management and staff and is clearly an instrumental incentive to improving quality. One dean of education at a university said:

"I sit in my office every Thursday morning between 830 and 930 and any of those Thursdays I could get a phone call saying I have an Ofsted inspection the following Monday." (UC4)

Administration of government priorities through core funding policies

Following the implementation of The Browne Report (2010), universities have obtained a much greater proportion of their income from student tuition fees, ostensibly meaning more student choice and a reduced role for HECFE (see Note 5.2 of Appendix A). The funding of FE colleges has always been complex and volatile. In the survey for this research, it was the most often raised comment in the free form section. This attitude was confirmed by several interviewees, who highlighted the problem of significant and frequent changes in government funding policies, including ones that leave existing students without funding support.

An example of such a change in policy was the relatively short lived Train2Gain initiative. This was introduced by the government in response to an international survey that had found the UK near the bottom of a league table for vocational skills. Funding was removed from traditional areas of adult further education and put in a pot to be bid for by FE colleges and private suppliers. However, in the view of one interviewee, the educational objectives were muddled, the administration was bureaucratic and time consuming and the output from many private providers was cursory and of poor quality. The initiative was subsequently disbanded but required enormous effort to set up and dismantle. Another example of a poorly thought out and short lived initiative was the introduction of the vocational diploma for young people which was supposed to provide a qualification to match A levels.

"Train2Gain was a bureaucratic nightmare – the LSC couldn't manage it and it became more and more diluted – so in the end it was basically everything is free – fill your boots – and for a short time massive private organisations were coming in and delivering Train2Gain in a very short space of time – sometimes as little as 5 weeks" (FA4)

"One minute we've got a diploma and it's the best thing since sliced bread and the next minute it's gone – we've invested all this money – all this equipment" (FA1)

The attitude of the two FE colleges involved in these interviews is noteworthy. While thinking many of the changes were not helpful for FE colleges and indeed for the UK economy, nevertheless these colleges rolled up their sleeves and got on with making the most of the changes – and, indeed, considerable innovation has flowed from this – particularly with regard to short and long full cost recovery bespoke programmes with large employers and a massive take up of young apprenticeships.

Administration of government priorities through new initiatives

The government, directly through BIS or DofE or indirectly through agencies, is continually starting educational reforms and educational initiatives, often associated with additional funding. These have a substantial impact on innovation in the sector. Examples of such innovations in this research include the vocational Foundation degrees, the reform of teacher training and the encouragement of new educational institutions – academies, university technological colleges and studio schools.

"Government is influential – many initiatives we wouldn't be able to do without being offered funding – it's not forceful pressure as there is always the option not to participate." (UC2)

"There is a shift in government policy for the regulation of early years education - we are already in that field – and it's kind of making sure we shift with the shift of funding……" (UC4)

"We have to respond to government policy in higher education….. around that whole question of how universities become agents for change in the development of the knowledge based economy…..– it's a good cultural and relational fit – and we are therefore able to engage with those things and deliver good value." (UA1)

Ministerial relationships with specific tertiary educational institutions

The government use educational institutions with a notable reputation as a sounding board for future government policies and to conduct pilots of these policies. Additionally, leading university vice-chancellors and FE college principals will be asked to sit on departmental and educational boards. Recent examples of institutional involvement that have been mentioned in this research include policy discussions concerning the Browne Review of university funding, the direct entry of 14+ students into FE colleges and the trialling of the training of people with learning disabilities.

9.4.2.2 The role of educational and development agencies

These are specialist government funded organisations which work in partnership with or support the aims or operational performance of universities and FE colleges. Table 9.4 sets out the functions of these agencies.

Table 9.4 Agencies working with the TES

Function	Agencies in the University sector	Agencies in the FE college sector
Provide core funding	Higher Education Funding Council for England (etc) Research Councils	Skills Funding Agency Young People's Learning Agency
Regulate quality	Quality Assurance Agency	Ofsted
Catalyst for innovation (Catapult)	Technology Strategy Board	
Partnership in regional/ city development (and associated funding)	Local Enterprise Partnerships (replaced Regional Development Agencies) Local councils	
Developing and sharing teaching and learning practice	Higher Education Academy	FE Guild (replaces Learning and Skills Improvements Service)

Function	Agencies in the University sector	Agencies in the FE college sector
Developing and sharing best practice in use of learning technologies	JISC (formerly Joint Information Systems Committee)	

Source=Author

The aim of the Technology Strategy Board is to accelerate economic growth by stimulating and supporting business-led innovation. In particular, it is responsible for creating seven "Catapult" centres which aim to transform "high potential" ideas into new products and services. One of the universities in this case study is a key player in two of these centres.

LEPs are partnerships between local authorities and businesses to help determine local economic priorities and lead economic growth and job creation within their local areas. They replaced the now defunct Regional Development Agencies, which several interviewees mentioned as being instrumental in co-ordinating and funding local partnership initiatives. They were mentioned in the interviews in connection with the civic university mission and the automotive partnership.

Local councils provide specific public services – including the management of primary and secondary schools (apart from those newly designated "free" ie independent). They were mentioned on many occasions during the interviews. The following are five examples, one from each of the five participating institutions: 1) they were interested parties in the two mergers of one of the FE colleges; 2) they were participants in the setting up of the academy, partly because it was one of their failing schools that was being taken over and partly because they were responsible for the "Building schools for the future" initiative, which had to be complied with; 3) they provided land in the setting up of the UTC; 4) they are members of the automotive partnership; 5) they were partners in the creation of the software hub. In addition, they sit, along with representatives of local FE colleges and universities, on numerous local boards and ad hoc initiatives.

The Higher Education Academy champions excellent learning and teaching in higher education and was mentioned on numerous occasions during the interviews as being

the primary means of disseminating best practice to universities. The pedagogic subject centres came in for especial praise, but these have been curtailed as part of budget cuts and interviewees were not sure whether the new structure would be as successful. Examples of where the Academy was mentioned in the interviews includes: 1) their role in validating the staff development certificate; 2) their advice in the design of a model for the HE in FE re-organisation; 3) providing advice in seeking solutions to the student assignment feedback problem.

The aim of LSIS was to raise standards, especially in FE. It has now been disbanded and its functions transferred to a new organisation, the FE Guild. Its role in organizing the beacon college scheme where outstanding colleges help failing ones was highlighted during the interviews. LSIS also provided learning and teaching materials, support and funding, one example being the staff coaching scheme cited as one of the innovations in this case study.

JISC champions the use of digital technologies in UK education and research. It was mentioned by interviewees from all five institutions as being a useful source of best practice in the use of technology enhanced learning and in other spheres. It holds regional conferences and other events, co-ordinates working groups, issues research studies and runs the famous JISC mailing list forum where educators can raise problems and solutions. JISC were particularly mentioned in the interviews in connection with three innovations: 1) around 2000 they co-ordinated and funded 15 projects connected with VLEs which one of the universities participated in and who said it was hugely useful in getting them off the ground with their early VLE development; 2) they funded the development of an employer engagement platform for one of the FE colleges; 3) they were in discussion with one of the universities to roll out their staff certificate on an international distance learning basis.

9.4.2.3 Educational peer group relationships

The spectrum of peer group relationships includes formal partnerships, ad hoc relationships and loose associations on the one hand and various intensities of competition on the other hand.

Collaborative relationships

The interviews contained several examples where peer groups collaborate on substantive innovative activities. Examples include: the provision of programmes, eg dual award degrees and joint schools administration in respect of teacher training; quality initiatives, eg peer group reviews of FE course development and staff development certificates; student support, eg Erasmus and student entrepreneurial schemes; and research, eg bids for Research Council grants.

"Collaboration is in our psyche" (UC2)

On a more informal level, the two FE colleges mentioned many instances where they had visited other peer group colleges for the purposes of vicarious learning. Examples included seeing: outstanding operations, such as land based curricula and hair and beauty salons; successful new academies; an employer engagement business unit; and electronic individual learning plan software being used. Often, institutions have regular bilateral peer to peer visits. It was emphasised that these relationships would not be with local competitive institutions.

"I have just taken on the responsibility for additional learning support – so I phoned the person from [redacted] who looks after learner services and visited them and was shown completely how they do it." (FA3)

As might be expected, there is more sharing in connection with teaching and learning practice than with client/ curriculum intelligence.

"The whole community in learning and teaching is a very sharing community. Networking with other institutions both in the UK and internationally is really important to us in terms of innovation for the institution." (UB2)

A special case is that of university panel examiners. It is traditional for university programmes to be assessed by panels of examiners who are academics from other universities. This is two-way learning. The university learns from the comments made by external examiners visiting their own curriculum areas; and the university learns

from the feedback of their own staff returning from being examiners in other universities.

Whereas partnerships are where peers get together for substantive activity, associations are loose forums, where the aim is typically to share best practice, to discuss and understand issues of the day or to lobby government. There was some feeling among the institutions with a high reputation that they give more than they take, that they are like a "showroom" and that this can be very time consuming.

There are several national associations for universities. Of the three universities, one is a member of the Alliance group who have a business facing focus; one is a member of the Million Plus group, mainly for urban ex-polytechnics; and one proudly stated "We are not a groupie" (UB1). Two of the universities mentioned belong to regional groupings which had originally been set up by the now defunct regional development agencies. One still functions, and has been associated with initiatives such as Graduate Advantage and Aim Higher and with co-ordinating policies which might encourage graduates to stay in the region. Also, vice-chancellors meet several times per year to discuss current issues and many of the interviewees, especially from the universities, mentioned gaining innovation know-how from several specialist groups – including SEDA (the professional association for educational developers); the Educational Development Group (for teaching and learning best practice); e-learning group (for implementers of technology enhanced learning); ARC (for registrars); and UCET (for teacher training schools).

There are two associations for FE colleges. The main one is the Association of Colleges which aims to represent and support all colleges. The second one is the 157 group, an exclusive group of 27 large and successful FE colleges set up to raise the profile of FE. Both FE associations have several specialist groups. For example, in this study, interviewees mentioned attending AoC groups relating to principals/ deputy principals, business development, quality assurance and additional learning support.

Competition among peers

Peer group relationships are quite complex and there is often a tension between co-operation and competition. Interviewees had mixed attitudes to competition. Most institutions are aware of what their competitors are currently doing - either through formal benchmarking, course organisers or external examiners. Interviewees were adamant that their aim is not to copy the competition, since what is right for one college, may not be right at another college. Typical quotes were:

"Competition does have an impact – we cannot sit on our laurels – you have always got to be one step ahead of the game." (FA3)

"This is a completely competitive market.....but we are not trying to copy anyone .....you have to be imaginative and have a unique selling point otherwise you will not compete" (UC3)

"No we wouldn't copy just for the sake of it..... an interesting one for universities at the moment are MOOCs……..universities are rushing like lemmings to do it……. We are saying at the moment that's not right for us - we don't have the brand…." (UC2)

"We know what we are good at – we know our space" (UB1)

Some respondents were positive about sharing with peers.

"We are careful about the competition, but it is public money, and we ought to share." (UC2)

"So there are areas in which the universities are explicitly in competition with each other and there are other areas where it is obvious that we can collaborate without it impinging on the competition, so we still do collaborate in certain things – I think the relationships are pretty cordial most of the time." (UA1)

Others, not so positive:

"Rhetorically we share, but practically, we don't." (UC3)

Competition has a local, national and international dimension. FE colleges are very much community based and their students live or work within easy commuting distance from the college. Hence, there is intense competition and little collaboration between local FE colleges.

"[A], [B] and [C] are sort of our local competition – so I would never ring them up and say Hi can I come in and look at your learner services because obviously they are going to say no." (FA3)

The local dimension also applies to many post-1992 universities, especially those with a high part-time intake. In one of the universities in this study, 60% of students come from the local catchment area. There is also fierce competition and very little collaboration where nearby universities have similar subject offerings.

Universities also compete at the national level on a subject by subject basis. UCAS clusters universities within subjects according to the profile of applicants' entry grades. Universities with a strong research base also compete in specific research areas, often at an international level. In addition, universities also compete on specific activities, eg investment in international students.

9.4.2.4 Relationships with other educational providers

Universities, FE colleges, schools and private providers have distinct relationships between each other.

Most universities have collaborative provision agreements with several FE colleges whereby they accredit the FE colleges' HE provision. These are necessarily close academic, quality assurance and administrative relationships. Also, FE colleges often visit nearby universities for advice. For instance, there was one instance of visiting a

university enterprise centre and another instance of exploring how to manage large employer accounts.

All the universities in this sample had a schools' liaison unit. Visits and open days would be organised with local schools both by the central schools' liaison unit and individual university departments. The purpose of this contact is twofold. Firstly, it is to raise the aspirations of children of say 13 or 14 or younger who have had no history of university attendance in their family. Secondly, it is to secure a supply chain of local student recruits. Two of the universities had a scheme whereby a large % of their students went out to local schools as student ambassadors or helped with mentoring children in say mathematics. This is of clear benefit to both parties.

Universities which offer teacher training have a much more direct relationship with local schools, particularly after the recent reform. All students at teacher training colleges have to have substantial work experience in a local school and so the recruitment of such schools and supporting them during the work based part of training is a massive and critical task.

There are several reasons why FE colleges have relationships with local schools. The prime reason is to secure future student recruitment. In one FE college, each senior manager had a group of local schools to account manage. This FE college also cemented relationships by offering Moodle support. The other FE college conducts joint peer group reviews with local schools. Another reason for a relationship is the joint provision of the curriculum. This often relates to schools providing academic provision and FE colleges providing vocational provision. However, there is growing competition between FE colleges and schools, as nearly all FE colleges offer an academic as well as a vocational curriculum and many schools, especially academies, are offering competition to FE colleges by specialising in vocational subjects such as construction.

Historically, private providers have occupied niche areas, such as accountancy or English as a second language. Their scope and scale has been increasing and for many FE colleges, they are a major source of competition. Both universities and FE colleges

sub-contact provision of some areas of the funded curriculum to private providers on a franchise basis.

9.4.2.5 Employers

The significant relationship between many tertiary educational institutions and employers was one of the surprises to emerge from the survey. Hence, it was included as a theme in this series of interviews. This turned out to be the right strategy as employer engagement was mentioned as a major thrust by all five institutions. In the past 20 years, many post-1962 and post 1992 universities have become business facing in order to differentiate themselves from the research intensive universities. There has also been a transformation in FE colleges as the government has ditched adult funding. This has encouraged universities and FE colleges into newer markets such as apprenticeships and the development of full cost recovery programmes – all of which has demanded a massive organisational switch to employer engagement. Typically, most universities and FE colleges will have employer engagement units, account management policies and customer relationship systems, which together are designed to provide a coherent focal point for employer contact. There is also significant contact with employers' associations, especially sector skills councils, of which several were mentioned frequently in the interviews, and to a lesser extent, local chambers of commerce.

The interviews demonstrated five main purposes of a relationship between a university/ FE college and employers.

Firstly, the purchase of educational services by employers is now an important source of income. These services include the design and delivery of bespoke degrees and short courses, the sponsorship of individual employees on courses from the catalogue, the hiring of apprentices and the provision of knowledge transfer services to small companies. Many of these services are full cost recovery, ie where all of the costs are covered from fees paid by the employer rather than through grants by the respective government funding agencies.

"Employers sit down with us and we look at what their skills gap is and what their needs are for the next year and this would dictate what qualifications they might want from us." (FA4)

Secondly, major employers play a significant role in the design of the catalogue of vocationally oriented courses. This is often achieved through joint membership of the various sector skills councils and sitting on institution's curriculum advisory boards.

Thirdly, employers support the institutions' aim of improving student employability. Examples of this are the offer of placements, the sponsorship of and participation in new institutions such as UTCs and studio schools and mentoring students on entrepreneurial schemes. UTCs and studio schools require considerable employer input in curriculum design and participation in student placements.

Fourthly, there is joint participation in collaborative research and development initiatives – such as the Catapult schemes mentioned earlier, the automotive partnership and the software hub.

Finally, there is a looser role in co-operating and co-ordinating in local economic regeneration initiatives and in joint membership of local boards.

In all of these activities, in terms of employment opportunities and training requirements, the public sector is important as well as the private sector. For example, in one of the universities, the major employers were: schools (teacher training); hospitals (nurse training); and local councils (social worker training).

Another point to note is that contact is at all levels – the senior management team provides senior level liaison and often the instigation of initiatives; curriculum management drive the implementation of initiatives and ongoing quality and viability; and lecturing staff design and run the courses and facilitate work placements.

It is quite apparent from talking to these universities that their role in employer engagement, applied research and regional economic growth has given them an alternative focus to that of the research intensive universities, so much so that they no

longer think of themselves as second class. It was also significant that the university interviewees, who were selected by their institutions to speak to employer engagement, were senior and very articulate pro-vice-chancellors.

9.4.2.6 Professional networking

Most interviewees in this study network extensively. They sit on a plethora of educational boards, employers' councils, local development boards and attend numerous ad hoc events and routine meetings. Their network would also include people whom they have met in the course of their working life and whom they continue to keep in touch with. Some interviewees appeared to have a vast network of contacts with whom they could pick up the phone and discuss in confidence pressing issues or sound out interesting ideas. Some interviewees appeared to have very few contacts.

"Our networking in partner institutions is really important to us in terms of innovation – personal links do make a difference." (UB2)

Of course, at the level of lecturer, academics will contact fellow academics in their respective subject area, on a one-on-one basis, at conferences and on joint undertakings.

However, it is noteworthy that only once did professional networking play a significant role in any of the specific innovations in this study, viz. as the trigger for the entrepreneurial programme for SMEs.

9.4.2.7 Suppliers

Suppliers mainly arose in interviews when discussing TEL facilities. All the cited relationships were strong and positive, and suppliers were seen to be competent and helpful – and certainly there was no mention of aggressive selling. Suppliers of educational software have a prominent role during the selection and implementation of their software – particularly in supporting the business case, in specifying which modules to take, in ensuring the system fits the organisation's needs and that staff are adequately trained.

9.4.3 Analyses based on collaborator types

9.4.3.1 Analysis of collaborator type by functional role

One clear avenue for analysis is the relationship between collaborator types and their functional roles. This is presented in Table 9.5. This provides an insight into the relative importance of different collaborator types to organisational innovation and at which phase in the innovation journey they make the greatest contribution.

9.4.3.2 Analysis of collaborator type by contribution to innovation type

The second relationship to highlight is between collaborator types and the respective innovation types. This is presented in Table 9.6. This provides an insight into which collaborator types are strategically important, in an innovation context, in contributing to corporate aims.

Table 9.5 – Mapping collaborator type against functional roles (Source=Author)

Collaborator type → Functional role ↓	**Central government and core national funding and quality agencies**	**Academic, technical and enterprise agencies and local government**	**Educational peer group institutions**	**Other types of educational provider**	**Employers**	**Professional networking**	**Suppliers eg TEL and buildings**
Exerting pressure for change	Pressure through funding, quality assurance and regulatory mechanisms. Pressure also to adopt new initiatives is exerted by direct appeal, especially to leading institutions.	These agencies have little authoritative power, although they do wield reputational influence.	There is some evidence of competitive pressure to imitate or to keep one step ahead.		There is some lobbying by employer groups, chiefly around curriculum design.	There is little evidence of pressure to conform from professional networkers.	There was no evidence of aggressive selling.
Source of funding/ income	Government funding of teaching & learning and research is a major source of income.	Some funds for specific initiatives.		Relatively small income from collaborative provision.	Employers are now a major source of income in respect of directing employees to the catalogue of courses, the co-development of bespoke full cost recovery courses and apprenticeships.		
Source of students				Local schools and colleges are a major source of students.	As well as a source of students, employers offer placements and career opportunities to students.		
Collaborative initiatives/ bids/operations		Co-partners in regional initiatives.	The government has encouraged joint bids for initiatives. There is little evidence of joint R&D or operations.		Major employers and the sector skills councils are major players in the design of the vocational curriculum.	There is little evidence of joint working among professional networkers.	One university and one software supplier had formed a partnership to develop a UK oriented VLE.

Table 9.5 (continued) – Mapping collaborator type against functional roles

Collaborator type ➔ Innovation type ⬇	Central government and core national funding and quality agencies	Academic, technical and enterprise agencies and local government	Educational peer group institutions	Other types of educational provider	Employers	Professional networking	Suppliers eg TEL and buildings
Supply of educational services				In connection with collaborative provision.			Software suppliers provide software and associated training courses. Consultants occasionally provide specialist educational change management consultancy.
Knowledge transfer/ sounding board	The government frequently sounds out leading institutions regarding prospective initiatives.	The academic and technical educational agencies are a rich source of know-how and resource materials.	There are a plethora of functional groups in all technical and management areas and at all levels. Their purpose is mainly to discuss current issues.	In connection with collaborative provision.	Joint design of vocational courses. Applied technical and management knowledge transfer, especially to SMEs.	All interviewees had a few professional networking contacts used to sound out new ideas and problem issues.	Software suppliers provide advice throughout the innovation journey.
Collective lobbying	The government is the recipient of constant lobbying, especially regarding funding.	Possible lobbying with regard to regional development.	Various groups exist, whom, inter alia, lobby the government.			There is little evidence of collective lobbying by professional networkers.	
Direct competition	The government actively encourages competition.		There is fierce local competition, especially, but not only, with regard to FE colleges. With regard to universities, there is national competition in subject areas and international competition for elite players.	Some local competition between FE colleges and universities and between FE colleges and schools and private providers.			

Table 9.6 – The contribution made by collaborator types towards each innovation type (Source=Author)

Collaborator type ➔ Innovation type ⬇	**Central government and core national funding and quality agencies**	**Academic, technical and enterprise agencies and local government**	**Educational peer group institutions**	**Other educational providers**	**Employers**	**Professional networking**	**Suppliers**
Create vision – business mission and civic mission	Policy direction, especially business facing mission	Ad hoc partnerships with local agencies and local government			Ad hoc partnerships in fulfilling vision	Sounding board and peer reviews	Consultancy support in implementing change
Mission change – FDAP	Policy direction and design & process approval.						
New institutions – academies and UTCs	Policy direction and funding	Sponsorship and co-partnership	Competitor	Sometimes co-partner in sponsorship	Sponsorship, curriculum design and subsequent use of services		
New centres	Ad hoc funding		Competitor		Co-development and use of services		
Vocational Programmes	Normal funding and quality control. Policy direction towards employer engagement and alternative funding streams		Competitor or occasional co-developer or source of vicarious learning	Possible co-development	Major role of employers and sector skills councils in curriculum design Subsequent use of services by employers, often full cost recovery		
Teaching practice	Some developments may need quality agency approval	Advice, technical resources and funding	Advice and best practice, usually through specialist agencies and groups				
Technology enhanced learning							Supply of educational software and associated advice and services such as training
Partnerships – international collaborative provision and industrial applied research	Collaborative provision - normal funding and quality control	Co-partner and possible sponsorship of industrial applied research partnerships	Collaborative provision – either as prime or sub-contract partner		Co-partner in industrial applied research partnerships		
Estates – twin campus	Ad hoc capital funding		Source of design ideas				Design, build and maintenance services
Re-organisation – twin mergers	Encouragement to take-over failing schools	Encouragement to take-over failing schools	Other player in a merger				Consultancy support in implementing change

9.5 INTRODUCTION TO THE INNOVATION JOURNEY

9.5.1 Introduction

This section introduces the study findings in respect of key aspects of the innovation journey, as a preamble to the more detailed analysis of organisational learning versus institutional conforming analysis in the next section.

9.5.2 Triggering innovations

The first point to note is that a member of the senior management team played the leading role in instigating at least 2/3rds of the innovations in this case study. In the case of the strategic innovations, such as vision/ mission change, new institutions/ new centres, new partnerships and mergers, it was the vice-chancellor or principal themselves that triggered the innovation. This corroborates the views of the interviewees, nearly all of whom cited the current vice-chancellor/ principal or a previous incumbent as a charismatic visionary.

The government is directly responsible for encouraging several of the more strategic innovations. Furthermore, without the government making available discretionary funds, many of the innovations may not have seen the light of day.

What is surprising is how insignificant is the role of competitive pressures. This corroborates what many interviewees said, especially the universities, that while they may keep an eye open on the competition, they do their own thing and do not copy the competition.

9.5.3 Justifying innovations

All interviewees said that it was standard practice for innovations that require investment money to have a business case. Arguments that benefits exceed costs and are aligned with corporate objectives are always required. Market demand is crucially important in the development of many of the innovations as this ensures the necessary

future income stream. However, sometimes benefit quantification is problematical and so positives from intangible items can be helpful. It is interesting to note the importance of reputation in all of the more strategic innovations and new programmes and, not surprisingly, the importance of wishing to improve the student experience in all of the teaching and technology related innovations. Some interviewees did admit that they had known a vice-chancellor/ principal to push through investments without a full business case – but that this is rare nowadays. The typical business case would often be succinct, perhaps only one page. Small investments would not need a formal business case if they could be resourced out of the relevant department's annual budget.

"As an institution I think we kind of know what we do and what we don't do – we don't tend to go chasing what doesn't align because we haven't the capacity." (UB1)

"The pro vice-chancellor responsible for resources is interested in a resource based business case – now reputation is going to come into it – but at the end of the day if all we can say is it will cost X, and all it is going to do is do us good reputationally, then I don't think it would get through." (UA1)

"In both examples [of cited technology enhanced learning innovations], a member of the top corridor wanted it to happen and that cuts through a whole load of other stuff." (UC1)

"The biggest drivers for change in my area [technology enhanced learning] are the NSS, employment statistics and things like that – all the stuff that counts in the league tables." (UC1)

9.5.4 Developing innovations

There was significant tailoring of all innovations. Almost all of the innovations were designed from scratch within each institution using ideas from several sources around the sector and taking especial note of the needs of customers and stakeholders – students, employers and the community. Even in the case of the software implementations, eg the VLEs, there is a huge scope for discretion in terms of what is implemented and how it is implemented. Similarly, while there is a standard format for

new institutions such as academies and UTCs, there is again a huge scope for discretion in terms of the institution's values and curriculum offerings. Probably the most constrained innovation in this case study is the government instigated teacher training reform.

Significant change was required in enabling an organisation to be fit and ready for implementing each innovation. Almost all of the innovations involved some element of organisational re-design: sometimes this required new structures and new jobs. In all cases, there was at the very least a programme of training for relevant staff. Often there were pilots.

9.5.5 Realising innovation benefits

Most interviewees said that they reflected on the performance of the innovation in terms of the implementation process and whether benefits were realized. Sometimes this was very formal with reports to specific audiences eg governors, agencies and sponsors; sometimes it required special statistical analyses eg in the utilisation of new technologies; sometimes it occurred as part of the routine institutional review processes; and sometimes it was the private reflections of the prime innovator. Measures of success were often identified in advance in the business case - for example in introducing new institutions and new programmes – as these would be based on strict enrolments and success rates targets.

9.5.6 Consultation

There was significant external consultation in some innovations, especially concerning vicarious learning from peers in the justification phase and in the design and implementation of an innovation with key players such as employers. For some innovations, there was very little external consultation. The reasons given for not looking externally were: this is a unique innovation and there is not anything similar elsewhere; the innovation is a natural extension of what is already happening in the institution; and the prime innovator/ team have adequate know-how based on their previous experience.

In all cases, there was some form of internal consultation. Usually, this was with those who would be responsible for implementation or delivery. Sometimes there was quite a wide consultation, eg in the cases of the academy and the student feedback initiatives, where in both cases all lecturing staff were consulted. Sometimes consultation was through curriculum area champions, especially with regard to changes in teaching practice and the implementation of new technologies. The student voice was often important and listened to through student committees, surveys and focus groups.

9.6 ORGANISATIONAL LEARNING VERSUS INSTITUTIONAL CONFORMING

9.6.1 Introduction

This section specifically addresses the following research objective:

RO8: To explore which of the characteristics of organisational learning versus institutional conforming are more in evidence during the innovation journey, and why?

Section 5.2.2 of the Research Specification chapter set out guidelines for evaluating this research objective. These guidelines are based on the specifications of OL and IC set out in the literature review, Chapter 3, and their application to the innovation journey, set out in Section 2.3. The guidelines for distinguishing organisational learning from institutional behaviour consist of two criteria:

i) how is the innovation justified; and

ii) what is the behaviour during the innovation journey?

An innovation is deemed to be OL based if justification relies on a business case, which includes alignment with strategic objectives and a cost-benefit analysis.

An innovation is deemed to be IC based if justification relies on one or more of coercion by the government; and/or imitating a leading industry player; and/ or adherence to the sector norm – this essentially means that most peers have already adopted the innovation.

Justification may entail elements of both OL and IC criteria, in which case one has to look at where the balance lies. A relevant question is whether reputation or legitimacy is involved in the justification. Reputation essentially concerns whether the innovation is estimated to improve performance. Legitimacy essentially concerns whether the innovation is perceived to demonstrate appropriate behaviour for a given sector. Reputation tends to be of relevance to OL justifications: legitimacy is an essential aspect of IC justifications.

There are three distinguishing behavioural characteristics of organisational learning. These are:

i) scanning externally for new ideas and opportunities;
ii) a continual monitoring – reflection – adjustment feedback cycle;
iii) sensemaking through open and transparent participation.

OL behaviour is essentially a proactive approach. IC behaviour is essentially a reactive approach. With IC, there are few typical actions, except the absence of OL actions.

9.6.2 Analysis of OL versus IC findings

Each of the 31 innovations has been evaluated using the criteria specified in the previous section. The detailed evaluation is set out in Appendix I. An analytical summary of this evaluation is presented in Table 9.7.

The first consideration is how innovations are justified. All 31 innovations have some form of business case, which is a strong indicator of OL. With regard to institutional conforming justification criteria, three innovations involve overt government coercion. Five innovations have some weak evidence, implicit, rather than explicit, of imitating, or, rather, wishing to keep abreast, of leading players. While interviewees did not admit to imitating a sector leader, it is clear in these cases that organisations were competitively driven to be a front runner. Seven further innovations had some evidence, again implicit, rather than explicit, of adopting a sector norm. In these cases, while interviewees did not admit to adhering to a sector norm, their innovations, whilst including a business case and not involving any explicit pressure to conform, do belong

to a generic category of innovations that are already sector norms. For example, although the clinical diagnostic centre was justified by OL justification criteria and had a unique design, the innovation is a sub-set of the category "research centres" which had become the norm for institutions wishing to promote their research credentials.

With regard to behaviour, all innovations, except two, exhibit scanning externally for ideas and opportunities; all innovations exhibit a continual monitoring – reflection – adjustment feedback cycle; and all innovations, except two, exhibit open and transparent internal consultation and participation. Thus, 27 of the 31 innovations can tick all three OL behavioural boxes and the remaining 4 can tick 2 out of 3 behavioural boxes. This is exceptionally strong evidence of OL behaviour.

In the final column of Table 9.7, justification decisions and behavioural characteristics are taken into consideration and innovations are labelled as either OL, IC or OL-N. 22 innovations are labelled OL, and these can be regarded as fully OL in terms of how they were justified and their behavioural characteristics. 3 innovations are labelled IC, and these can be regarded as primarily IC, for they are strongly dependent on government coercion, despite exhibiting OL behavioural characteristics. 6 innovations are labelled OL-N. These are justified with a business case and exhibit OL behavioural characteristics. Nevertheless, the innovation is a sector norm, even if this fact was not regarded as pertinent to the justification by the interviewee. (Second generation VLE (UA) has been categorised as OL, because it is a necessary replacement of a first generation VLE, which was categorised as OL).

Table 9.7 Table of OL versus IC evaluation by innovation

Innovation	U / FE	Justification				Behaviour			OL / IC / OL-N Label
		OL	IC			OL			
		BC	GC	LI	SN	ES	RA	IC	
New institutional vision									
Civic vision (UA)	U	✓				✓	✓	✓	OL
Business facing vision (UC)	U	✓				✓	✓	✓	OL
Government approved extension of mission									
FDAP (FB)	FE	✓		▫		✓	✓	✓	OL
Additional institutions									
UTC (UB)	U	✓		▫		✓	✓	✓	OL
14-19 academy (FB)	FE	✓		▫		✓	✓	✓	OL
Additional centres									
Clinical diagnostic centre (UB)	U	✓			▫	✓	✓	✓	OL-N
SME centres (UC)	U	✓				✓	✓	✓	OL
Land based centre (FA)	FE	✓				✓	✓	✓	OL
HE centre (FB)	FE	✓			▫	✓	✓	✓	OL-N
New vocational programmes									
Vocational programmes (UA)	U	✓				✓	✓	✓	OL
Vocational programmes (UB)	U	✓				✓	✓	✓	OL
SME programme (UB)	U	✓				✓	✓	✓	OL
Teacher training reform (UC)	U	✓	✓			✓	✓	✓	IC
Vocational programmes (FA)	FE	✓				✓	✓	✓	OL
Vocational programmes (FB)	FE	✓				✓	✓	✓	OL
New teaching practices									
Student assignment feedback (UB)	U	✓					✓	✓	OL
Staff certificate (UB)	U	✓					✓	✓	OL
Staff coaching (FB)	FE	✓			▫	✓	✓	✓	OL-N
New technology enhanced learning									
First generation VLE (UA)	U	✓		▫		✓	✓	✓	OL
Second generation VLE (UA)	U	✓			▫	✓	✓	✓	OL
First generation VLE (UC)	U	✓		▫		✓	✓	✓	OL
First generation VLE (FA)	FE	✓				✓	✓	✓	OL
First generation VLE (FB)	FE	✓			▫	✓	✓	✓	OL-N
Lecture video capture (UB)	U	✓				✓	✓	✓	OL
Electronic voting systems (UC)	U	✓				✓	✓	✓	OL
Electronic ILP (FA)	FE	✓	✓			✓	✓	✓	IC
New partnerships									
Engineering partnership (UC)	U	✓				✓		✓	OL
International collaborative provision (UA)	U	✓	✓			✓		✓	IC

Innovation	U / FE	Justification				Behaviour			OL / IC / OL-N Label
		OL	IC			OL			
		BC	GC	LI	SN	ES	RA	IC	
International teacher training project (UC)	U	✓			▫	✓	✓	✓	OL-N
New estate									
Twin campus (UA)	U	✓			▫	✓	✓	✓	OL-N
Organisational restructure									
Twin mergers (FA)	FE	✓				✓	✓	✓	OL

Source:Author

BC=business case; GC=government coercion; LI=leader imitation; SN=sector norm; ES=external scanning; RA=reflection and adjustment; IC=internal consultation

▫ = implicit, rather than explicit justification

Two further analyses are conducted. Firstly, Table 9.8 sets out the results by university versus FE college. It can be seen that the ratio of OL to OL-N to IC innovations follows a similar pattern for both universities and FE colleges. This adds some weight to the authenticity of the results.

Table 9.8 Count of OL versus IC types by universities and FE colleges

Justification basis	Universities	FE colleges	Total
OL	15	7	22
OL-N	3	3	6
IC	2	1	3
Total	20	11	31

Source=Author

The second analysis is whether OL-N or IC relate more to one or other of the innovation types. No such bias is found.

These are somewhat more polarised results than expected and the possible reasons for this are dealt with at length in Chapter Ten – Discussion. One further input, is to comment further on the distinction between explicit and implicit justification. In three innovations, the author had the impression that although a conventional business case was developed, the underlying motive was because very senior management wished to initiate innovations of a certain type, that accorded with a strategic direction fitting for such an aspiring university, rather than that innovation emerging as an irresistible

opportunity in its own right. If true, and it has to be said there was no explicit evidence, this is clearly indicative of institutional conforming behaviour.

9.6.4 Interviewee perspectives on convergence in key sector issues

A completely different approach to answering this research question is to explore the likelihood of sector convergence with regard to specific tertiary education policies. As many of the interviewees were senior managers, the opportunity was taken of asking them to comment on three current issues of TES direction. The question was would there be eventual convergence on a standard institutional model, or would there be differentiated segmented models, or would there be a continuum of approaches. The former would indicate an institutional conforming tendency. The three issues are: research versus teaching and learning; widening participation; and international student business. The unanimous view was that there would not be convergence to a standard institutional model in regard to any of the three issues. A summary of interviewees' opinions is presented in Appendix J.

9.7 POSITIONING THE DEVELOPMENT OF INNOVATION CONCEPTS

This section addresses the following research question:

RO10: Where are collaborative behaviour sources positioned in the development of concepts for strategic innovative behaviour, compared with mainly internally generated sources and mainly externally generated sources, respectively?

Table 9.9, at the end of this sub-section, shows where the major element of concept development took place for each of the 31 innovations. Each innovation is allocated to one of three columns - mainly in-house, mainly joint collaboration or mainly externally. The second column is described as "innovation attributes". In an attempt to identify patterns in the location of concept development, four specific innovation attributes have been identified. These are labelled: S&P (structures and processes); COL (collaboration); SUP (suppliers); and GOV (government). Structures and processes means the innovation is mainly concerned with setting up new internal

structures and/or processes. Collaboration means the innovation is jointly designed with external players, eg employers. Suppliers means suppliers have a strong input into the design, jointly with internal players – examples of such suppliers are software providers, LSIS and estates architects. Government means the government controls the design. These four innovation attributes in this research are mutually exclusive and consistently map to, and are predictors of, the concept development location. This is shown in Table 9.10.

Table 9.10 Innovation attributes mapped to source of innovation concepts

Concept development location➔ Innovation attributes ⬇	In-house	Joint	External
Structures and processes	✓		
Collaboration		✓	
Government			✓
Suppliers		✓	

Source=Author

The distribution of concept development for each of the 31 innovations across the 10 innovation types is depicted in Table 9.11.

Table 9.11 Innovation design attributes mapped to innovation types

Concept development location ➔	Internal	Joint		External
Innovation design attributes ➔ Innovation type ⬇	Design based on internal structures and processes (S&P)	Collaboration with external players (COL)	Supplier design with local tailoring (SUP)	Government controlled design (GOV)
Vision	1	1		
Mission change				1
New institution		2		
New centre	4			
Vocational programme		4	1	1
Teaching practice	2	1		
TEL	3		5	
Partnerships	1	2		
Estates			1	
Re-organisation	1			
Total	12	10	7	2

Source=Author

One would expect vision and re-organisational type innovations, including new centres, mergers and new teaching practices to be internally based; innovations with partners, including new institutions, vocational programmes and new partnerships to be collaborative; also making supplier designs work in a specific location to be collaborative; and, finally, government controlled innovations to be mainly external. With a few exceptions, these patterns are found in Table 9.11.

The final analysis in this section, distributes concept development locations between universities and FE colleges, as shown in Table 9.12.

Table 9.12 Distribution of innovation design attributes across universities and FE colleges

Concept development location ➔	Internal	Joint		External
Innovation design attributes ➔	Design based on internal structures and processes	Collaboration with external players	Supplier design with local tailoring	Government controlled design
Universities	9	5	4	1
FE colleges	3	5	3	1

Source=Author

It can be noted that university innovations appear to involve more internal design than FE college innovations. This is entirely due to two innovation types - changes in teaching practice and the implementation of TEL – which are much more likely to be designed in-house in universities than by FE colleges who are likely to take externally supplied designs.

Table 9.9 Where concept development took place for each innovation				
Innovation	Innovation attributes	Where concept development mainly took place		
		Internally	Joint collaboration	Externally
Vision – civic	COL		With local government, agencies and employers	
Vision – business facing	S&P	Senior management team and external consultants		
FDAP	GOV			Government template
Academy	COL		With local government, agencies, employers and schools	
UTC	COL		With local government, agencies, employers and colleges	
Clinical diagnostic centre	S&P	Major enhancement of existing facility and expertise		
SME centres	S&P	Trigger was availability of external facilities, but design and detailed implementation was internal		
Land centre	S&P	Mainly internal design from personal experience, with some external stakeholder and vicarious input		
HE centre	S&P	Mainly internal design from personal experience		
Vocational programmes (x4)	COL		Joint specification with large employers and sector skills councils	
SME programme	SUP		Sponsor template, tweaked locally	

Table 9.9 Where concept development took place for each innovation				
Innovation	Innovation attributes	Where concept development mainly took place		
		Internally	Joint collaboration	Externally
Teacher training reform	GOV			Government format
Student feedback	S&P	Wholly internal devolved design		
Staff certification	S&P	Mainly internal from personal experience		
Staff coaching	SUP		LSIS template and support, considerably tailored in implementation	
VLE (x 5)	S&P (x1) SUP (x4)	One first generation VLE was developed in-house	Four first generation VLEs were all off the shelf software products, but choice of modules and approach to utilisation was internally designed. One second generation VLE was especially tailored for the institution.	
Lecture data capture/ electronic voting (x 2)	S&P	Existing technology, but approach to use designed and implemented internally.		
Electronic Individual Learning Plan	SUP		Off-the-shelf software implemented to a standard approach but with local organisational design	
Applied research partnership	COL		Approach negotiated between partners – agencies and major industrial players	
International collaborative provision	S&P	Mainly internal from personal experience		

Table 9.9 Where concept development took place for each innovation				
Innovation	Innovation attributes	Where concept development mainly took place		
		Internally	Joint collaboration	Externally
International teacher training	COL		Joint specification with clients	
Twin campus	SUP		Architect designed with consultation on spacial utilisation	
Twin mergers	S&P	Internally driven design		

Source=Author

9.8 SUMMARY OF FINDINGS

RO1

31 innovations were described and analysed within 10 innovation types. There was a spread of innovations across universities and FE colleges. Two analyses are presented: one matches innovation type against seven generic corporate aims; and one matches innovation type against the organisational impact in terms of infusion and diffusion.

RO4/5

A focus of the interviews was to identify the influence of collaborative relationships on strategic innovative behaviour. Seven types of collaborative partner emerged. Two analyses are presented: one matches collaborator type against seven emergent functional roles; and one matches the contribution of each collaborator type towards each innovation type.

RO8

A second focus of the interviews was to explore how each innovation was justified and the behavioural characteristics of the innovation journey. On analysis, this resulted in 22 innovations being classified as based on an organisational learning approach, six innovations being classified as being mainly organisational learning based with certain institutional conforming features and three innovations being classified as based on an institutional conforming approach.

RO10

It was found that four specific innovation attributes are good predictors of whether the source of innovation concepts is in-house, joint with a collaborative partner or from the external public domain. The distribution of the 31 innovations was found to be 12 internal, 17 joint collaborative and only two external.

Apart from these research objectives, the case study found that internal collaborative characteristics relating to leadership and co-ordinating mechanisms emerged as important in relation to strategic innovative behaviour.

CHAPTER TEN

DISCUSSION

10.1 INTRODUCTION

The purpose of this chapter is to discuss the contributions made to theory, method and practice by this thesis. The main focus is to summarise the research findings, compare the results from the survey and case study and then evaluate whether these findings confirm, differ from and/or add to the theory presented in the literature review. In this regard, it is useful to note that according to Sutton & Straw (1995), theory is a story about why there are systematic relationships among phenomena and an understanding of the associated underlying processes.

Two major theoretical topics are covered, corresponding to the two sets of research questions. The first topic (Section 10.2) concerns whether collaborative behaviour influences strategic innovative behaviour, and which types of collaborator are more influential, and why. Do findings hold in respect of variations in the specification of dependent and independent variables and the incorporation of contextual control variables? In particular, are the findings consistent for both universities and FE colleges; and how valuable is collaboration as a source of innovative ideas, compared with internal sources and public domain sources? In addition, recommendations are made which highlight some important methodological improvements. The second topic (Section 10.3) concerns whether organisational learning or institutional conforming is more associated with strategic innovative behaviour, and why. Contextual contingencies are again examined. A new categorisation for innovation justification criteria is presented.

Two further topics are discussed. Section 10.4 explores styles of collaborative/ innovative behaviour. It became apparent during the interviews that one could

differentiate specific behavioural characteristics among interviewees with regard to collaboration and innovation respectively. Embryonic categories are developed and analysed. Finally, Section 10.5 deals with normative topics rather than theory – in particular, what advice do the findings have for those responsible for government policy and for senior executives in the TES.

10.2 COLLABORATION AND INNOVATION

10.2.1 Does collaborative behaviour influence strategic innovative behaviour?

This is the primary research question. The existing empirical evidence is summarised in Table 2.9. Existing empirical evidence overwhelmingly shows a positive relationship between collaboration and innovation. However, this evidence is almost entirely quantitative with very weak measures for the main variables (often simple binary indicators) and the context is rarely in service sectors. Furthermore, the absence of qualitative studies means that the underlying processes and reasons for decisions have not been investigated.

The findings from the survey in this thesis are encapsulated in the correlation matrix – Table 8.40, the path analysis model – Figure 8.14 and the key multi-variate analysis results summarised in Table 8.61. These show a significant positive relationship between collaborative behaviour and strategic innovative behaviour. This relationship holds for all innovation clusters and a series of organisational and environmental control variables, including the often cited organisation size. The survey uses much more robust measures than have been used in previous studies. In particular, strategic innovative behaviour uses a 12 item multi-faceted construct and collaborative behaviour uses a 31 item multi-faceted construct.

The university and FE college findings are broadly similar. For both types of institution, there is a moderate, positive and significant relationship between CB and SIB: .36*** in the case of FE colleges and slightly higher at .45*** in the case of universities. However, there are two anomalies. Firstly, the survey showed organisational learning as a mediator in respect of FE colleges and not for universities. This is surprising, as organisation learning is shown in this thesis to be fundamental to

both collaborative behaviour and strategic innovative behaviour in both the survey and the case study. No theoretical or methodological explanation is apparent. Secondly, the survey found sector competition to be a moderator for FE colleges but not for universities. This finding was also apparent in the case study interviews. The author speculates that the reasons for the perceived heavy sector competition for FE colleges could be the existence of many geographically proximate FE colleges, especially in metropolitan areas; many other proximate education providers – including schools, universities and private education providers; and a perceived threat to their very existence because of ambiguous government signals.

The case study is a rich description and analysis of 31 innovations, cited by interviewees from five TES institutions, and the influence that seven key collaborator types, that emerged during the interviews, have on the innovation journey. The findings are encapsulated in four innovative exhibits. Two exhibits analyse the relative importance of each of 10 emergent innovation types: table 9.3 analyses the contribution each of the 10 innovation types makes to 7 generic corporate objectives; and figure 9.1 displays the organisational impact of each of the 10 innovation types in two dimensions – the depth of impact on business units and the spread of impact through business units. Two further exhibits analyse the relative importance of each of the 7 emergent collaborator types: table 9.5 analyses the functional role of each of the 7 collaborator types; and table 9.6 analyses the contribution each collaborator type makes to each innovation type. Thus the rich individual innovation and collaborator descriptions are converted into systematic "how" and "why" analyses.

10.2.2 Who and why are the collaborators influencing strategic innovative behaviour

According to existing theory, there are three major reasons for organisations to collaborate. These are to reduce the costs, risks or timescales of R&D or market entry; to provide scale production economies; and to achieve shared learning and knowledge transfer. The triggers are: changing customer or market needs; changing technologies; and competitive behaviour. In the literature, the typical context is a complex supply chain consisting of production/ research networks such as those found in the automotive, aerospace and biotech industries.

Turning to this research, evidence from the survey can be found in Table 8.31 and the subsequent discussion. The survey is necessarily simplistic, but the conclusion is that three collaborator types have the strongest influence – employers, professional networking and peer group providers – in that order. The government and its agencies were found to have the weakest influence, especially in respect of FE colleges. The evidence from the case study is much more nuanced and one could easily conclude that all collaborator types are important, depending on the specific circumstances and needs of the institution. This is shown in tables 9.5 and 9. 6, which present a comprehensive and systematic analysis of the functional role and benefits contribution of each of the 7 emergent collaborator types. Table 10.1 summarises these findings, and, for comparison purposes, matches each emergent collaborator type against the equivalent collaborator type in private sector industrial and service companies.

Table 10.1 Role of collaborator types in the TES compared with private industry

Collaborator type in TES	Contribution made by TES collaborator to innovation	Equivalent collaborator type in private sector
Central government and core national funding and quality agencies	Major source of income and pressure to improve quality of performance and adopt new initiatives. Facilitation of competition and cooperation.	No equivalent
Academic/ technical agencies.	Provide discretionary funds for specific initiatives and are a rich source of know-how and resource materials.	Research institutes and consultants exist in the private sector, but do not have anything like the same importance, nor do they provide funding.
Local enterprise agencies/ local government	Co-partner in regional initiatives.	Similar, but not nearly so relevant or important.
Educational peer group institutions	Strong competition – locally for FE and locally and nationally for HE. Joint bids for government research funds, but little other joint R&D or operations. Plethora of groups to discuss/ lobby on current issues.	Much stronger alliances/ networks, especially in high tech industries. Similar industrial associations.

Collaborator type in TES	Contribution made by TES collaborator to innovation	Equivalent collaborator type in private sector
Other types of educational provider	Schools are a major source of students. Collaborative provision arrangements with other providers.	No equivalent of the intermediary role of schools. Collaborative provision equivalent to licensees and franchisees.
Employers	Major source of income for catalogue and bespoke courses. Design of curriculum with sector skills councils. Work experience and career placements for students. Knowledge transfer, especially with SMEs.	Equivalent to B2B relationships – dyadic or network.
Professional networking	Sounding board regarding problems and new ideas – often with previous colleagues.	Similar
Suppliers of infrastructure	Critical for supply of expertise and best practice, especially in the areas of TEL and estates.	Similar

Source = Author

There are many similarities between the TES and the private sector: although there are two points of note. The first thing to note is the form of the supply chain and that this depends, as one would expect, upon market characteristics. In the TES, customers consist of private students and employers (although the latter also play an important partnering role in supply) and schools have many of the attributes of suppliers. The supply chain configuration in the private sector depends on the industry and can be network B2B, dyadic B2B or retail. The network B2B configuration is not found in the TES: it is a feature of supply chains found in high tech industries. These industries can be very complex, turbulent and competitive and the nature of their collaboration and innovation is correspondingly more complex.

The second thing to note is the role of the central government and its agencies. Although the survey found that the government was not regarded as an important collaborator, the case study found that the influence of the government is hugely important, particularly in instigating/ funding new initiatives. It is possible that in the survey, participants did not interpret their relationship with the government as collaborative, but more coercive, although this would be unfair as many government

initiatives are path breaking yet discretionary. FE colleges at the time of the survey were having to accept frequent changes of government core funding policies and this may have soured their responses.

10.2.3 Relevance of collaboration to the various innovation types

It is clear from Table 9.6, that collaboration is more significant and purposive in regard to some innovation types compared with others. Table 10.2 sets out the nature of collaboration depending upon innovation type. Those innovation types with a relatively high level of collaboration are annotated * in the final column.

Table 10.2 Innovation type and the dependency on collaboration

Innovation type	Main collaborators and their role in the innovation	Importance of collaboration
Create institutional vision	Initial government steer. Joint working with local employers, enterprise agencies and local government.	Medium
Gain government approval for a change in mission (FDAP)	Initial government steer. Academic agency regulatory approval. Joint working universities/ FE colleges to cease current collaborative arrangements. Some vicarious learning from peers.	Medium
Set up new institutions	Initial government steer. Co-sponsorship with local employers, other local educational providers and local government. Some vicarious learning from peers.	High
Set up new centres	Little collaboration.	Low
Establish vocational programmes	Extensive design and implementation collaboration with local employers.	Very high
Develop teaching practices	Ad hoc collaboration with academic agencies and vicarious learning from peers. Some discretionary funding from government.	Medium
Implement technology enhanced learning	Significant collaboration with IT suppliers re products, expertise and best practice. Some discretionary funding from government. Vicarious learning from peers.	Very high

Innovation type	Main collaborators and their role in the innovation	Importance of collaboration
Develop partnerships	Industrial partnerships involve collaboration with enterprise agencies, specialist research institutes and employers. Some discretionary funding from government.	Very high
Develop estate	Significant collaboration with architects and builders. Some discretionary funding from government.	Very high
Restructure organisation	Other player is a peer. Initial steer from central or local government.	Low, apart from with peer being taken over.

Source = Author

There is high collaboration where: i) implementation requires a close partnership with a co-sponsor; ii) the innovation is a bespoke vocational programme with a specific employer; or iii) the innovation is heavily dependent on a specialist supplier.

10.2.4 A comparison between innovation and collaboration in universities compared with FE colleges

Table 9.2 in the Case Study chapter sets out the 31 innovations explored in this thesis according to innovation type and institution type. Two big picture differences stand out between the nature of university innovations compared with FE college innovations. Firstly, two of the universities cited major changes to their vision/ mission, associated with major organisational, cultural, policy and operational changes that took many years to implement, and, in fact, the third university had undergone a similar mission change several years earlier. On the other hand, although the FE colleges had made significant changes to their client structure and curriculum, they had not undergone a visionary mission change. Secondly, the universities had invested in several speculative innovations – for example, the SME centres, the early introduction of VLEs and other technology enhancements, the automotive partnership and the international teacher training project – whereas the FE college innovations could all be described as essential investments to ensure ongoing student demand and income.

The author believes there are three reasons that account for these differences. Firstly, the universities have much more autonomy from the government than do FE colleges. In particular, FE colleges' client and curriculum focus is very much directed by year to year prescriptions of government funding. Secondly, universities have far more financial strength than do FE colleges. This is partly because a university is typically eight times larger than an FE college (please see Section 8.2.1.2) and a university typically has 2.3 times the annual FTE funding per student than does an FE college (please see Appendix A). Thirdly, universities enjoy a more recognised and valued position in the national and local, economic and social, fabric of the community than do FE colleges.

The nature of collaboration is very similar for universities and FE colleges. As is stated above, universities have far greater autonomy from the government than do FE colleges. However, both types of institution obtain most of their customers (students) from schools and both now need to derive substantial income from providing bespoke courses for employers – with FE colleges also deriving a significant income from apprenticeships. Similarly, both types of institution rely on academic agencies for significant knowledge transfer and some discretionary funding; both rely on TEL and estates suppliers for delivering infrastructure solutions and providing know-how; and both have an uneasy competitive/ cooperative balance with peer group suppliers, especially FE colleges with local peers. Finally, universities play a far greater role in regional regeneration and industrial R&D than do FE colleges and consequently have far more associated partnerships with enterprise agencies and relevant niche employers.

10.2.5 Positioning of collaboration as a source of innovative ideas

As a check on the relative importance of collaboration in an innovation context, the research also looked at the importance of internally generated ideas and ideas from the public domain. The survey asked respondents to say who developed the concepts for their quoted innovations – the choices being – "mainly your institution", "your institution in collaboration with others" and "mainly other institutions". The responses are very polarised. The overall ratio for universities is 78:19:3 and that for FE colleges is 62:36:2. These ratios appear to show that internal sources are much more important than collaborative sources. However, the key to interpretation is an analysis of the

question wording, which says "who **developed** the concepts". The likely explanation is that while institutions **gather ideas** from many sources, including from collaboration, they regard it as an internal task to **develop** these ideas into something fit for internal implementation.

This is corroborated by the case study findings, where Table 9.11 shows the ratio between internal concept development/ collaborative concept development / solely external concept development to be 12:17:2. This confirms the importance of collaboration to innovation and again confirms the relative unimportance of solely external influences.

A useful by-product of this analysis was the finding that the source of innovation concepts – in-house v joint collaborative v external – could be predicted from four specific innovation attributes, as depicted in Table 9.9.

10.2.6 Shedding light on the value of social capital

In Sections 2.4.4 through 2.4.7, several theories were presented concerning relationship building and relationship structures. These theories were not a direct emphasis in the ROs, although they were used to construct measures in the survey and to provide context for the case study. However, the case study does shed light on one of these theories – social capital. According to Nahapiet & Ghoshall (1998), the expected benefit of social capital is the serendipitous re-combination of previously disjointed data belonging to two or more separate parties and the result is a new and valuable idea, typically of a technological nature. This phenomenon was not found in the case study. However, circumstances were found where the needs of one party were matched with the skills of another party. For example, say in a sector-skills meeting an employer outlines a problem in their organisation which leads an educational provider at that meeting to realise that their institution may have the capacity to develop solutions to solve the problem. This juxtaposition of need and know-how is commonplace and is a significant benefit of social capital, particularly between people with different skill sets/ roles. Essentially, this demonstrates that innovation is often more about novel application, rather than novel invention.

10.2.7 New methodological ideas

In the course of any research, it is likely that existing methods need to be revamped. Three of the many instances in this thesis are highlighted in this section.

The first concerns the scoping and definition of organisational innovation. There are two new approaches in this topic area. The first concerns how innovation is measured in a survey. Hitherto, the typical approach has been to identify a list of current widely implemented innovations in a sector and tick off how many a specific organisation has implemented. There are two weaknesses with this approach – the tick process is crudely binary, and the approach takes no regard of importance. In this thesis, a new approach has been developed. The concept of an innovation space has been developed covering products, processes and business organisation. Respondents then had to assess how effectively each element of the innovation space had been covered by recent innovations. This approach is comprehensive and systematic and gives due weight to important innovations.

The second new approach developed uniquely for this research, concerns how the scale of innovation is defined. Hitherto, this has been a distinction between incremental and radical, which is difficult to measure and again does not really cover relative importance. In this thesis, the concept of a strategic organisational innovation was defined as one discussed by the senior management team. It was adopted in both the survey and case study and had the advantage of being both easily understood and easily measured.

The third example of an improved approach developed for this research is the innovation journey framework, specified in Section 2.3. This was crucial in the case study for specifying comprehensively and systematically a series of tasks and decisions making up the entire innovation process. This enabled processes to be discussed systematically in the interviews and was the starting point for the thematic analysis of interviewee data. As an aside, it is worth commenting that two expected sub-processes were not found in the case study. The first sub-process was the assumption that since organisations have many competing investment opportunities and scarce financial and management resources, they therefore have to filter out potential "winners". This was

not found. Perhaps a private sector organisation has more opportunities than a university or FE college because they may have a dedicated R&D department; or an active supply chain; or entrepreneurial business unit leaders. The other sub-process that was not found was coalition building. This also assumes competing opportunities and, in addition, pro-active business unit leaders. In the five institutions in the case study, although the business unit leaders were operationally autonomous, it was instructive that nearly all strategic innovation was triggered by the senior management team – and thus coalition building was not so relevant to investment choice decisions, only to innovation implementation decisions.

10.3 ORGANISATIONAL LEARNING VERSUS INSTITUTIONAL CONFORMING

10.3.1 Evidence from the survey and case study

The second research topic asks which of two alternative schools of thought, organisational learning and institutional conforming has more influence on strategic innovative behaviour, and why. In the next parts of this chapter, the findings from the survey and case study are summarised and explained. These findings demonstrate that organisational learning is clearly pre-dominant.

In the Survey Findings chapter, Section 8.5 has three pieces of evidence that show that strategic innovative behaviour is influenced more by organisational learning than by institutional conforming. Firstly, in respect of the univariate statistics, for organisational learning the mean score is much higher than the Likert mid-point; and for institutional conforming the mean score is somewhat lower than the Likert mid-point. Secondly, in respect of the covariate statistics, the relationship between organisational learning and strategic innovative behaviour is moderate, positive and significant; while the relationship between institutional conforming and strategic innovative behaviour is weak, negative and significant. These univariate and covariate results are robust and hold, with minor exceptions, for all innovation clusters and for all control variables. Thirdly, organisational learning is a mediator in the relationship

between collaborative behaviour and strategic innovative behaviour, whereas institutional conforming is not.

The most revealing evidence is from the case study. Section 9.6 of the Case Study chapter considers two criteria for distinguishing which of organisational learning or institutional conforming is more in evidence during an innovation journey. These criteria concern, firstly, how an innovation is justified and, secondly, whether there is evidence of an adaptable and consultative approach. Table 9.6 shows that the justification for all 31 innovations is strongly based on criteria associated with organisational learning, ie a business case including alignment with strategic objectives and a positive cost-benefit ratio, and only very weakly based on criteria associated with institutional conforming, ie coercion by the government, adhering to an established sector norm or imitating a leading sector player. Turning to the second criteria, Table 9.6 also shows that the three fundamental characteristics associated with organisational learning, ie scanning externally for opportunities, a continual monitoring/ reflection/ adjustment of performance and transparent and open sensemaking, are strongly present in the ten innovation types (institutional conforming behaviour would have been exhibited by an absence of these characteristics). As a result of these findings, 22 of the 31 innovations can be clearly labelled as being based on an organisational learning approach, while 3 can be clearly labelled as being based on an institutional conforming approach. The remaining 6 innovations are hybrid cases in that each, based on the two criteria, has all the attributes of an organisational learning approach with no overt evidence of institutional conforming, and yet each innovation belongs to one or other generic categories of innovation that are already conventional TES aspirations, even if not fully fledged sector norms.

On the face of it, this evidence appears conclusive in favouring organisational learning criteria over institutional conforming criteria. In fact, the situation is complex and nuanced. In the first place, not all of the business cases were entirely rigorous. Secondly, although all of the innovations were discretionary, many of them would not have got off the ground without some form of government grant. However, this does not constitute coercion. Thirdly, stakeholder expectations were present for many of the innovations, but these were never strong enough to be sufficient alone to justify adoption.

The final piece of evidence is described in Section 9.6.4 where interviewees were firmly of the opinion that the TES would not converge on one specific institutional model in respect of three current TES issues – viz. teaching and learning versus research, widening participation and international student business. In each case, interviewees thought there would be a spectrum of business models, indicating discretionary decision making based on specific circumstances and strategies.

Overall, the evidence from both the survey and case study is that organisational learning has a strong influence on organisational innovation as opposed to institutional conforming which has at best a weak influence.

The evidence for this overall finding is consistent for universities and FE colleges for the survey and the case study. With regard to the survey, Table 8.33 shows the correlation between OL and SIB to be .40*** for universities and .44 for FE colleges; and the correlation between IC and SIB to be -.27* for universities and -.24* for FE colleges. While with regard to the case study, Table 9.8 shows the ratio of OL / OL-N / IC innovations to be 15:3:2 for universities and 7:3:1 for FE colleges.

10.3.2 The weak empirical evidence for institutional conforming in this thesis

Institutional theory is a widely quoted sociological theory in organisational studies. Why is it that there is very little empirical evidence for its key concepts in this research? This question will be looked at from two perspectives - the organisation itself and its stakeholders. Firstly, from an **organisation's perspective**, does it select innovation opportunities because they adhere to a mythical standard design of organisation and practice or because on rational analysis the opportunities appear to offer performance gains. Table 10.3 assesses in these terms, the ten innovation types selected by organisations in this thesis: it can be seen that every one of the ten innovation types indicates more of a performance gain influence than a sector myth influence, many markedly so.

Table 10.3 Is the organisational decision to adopt each of the ten innovation types based on sector myths or demonstrable performance gains?

Innovation type	Discussion
Create vision	The decision to adopt a business facing vision was a strategic gamble for a university that needed to find a valid strategic niche and that had little hope of joining the Russell Group of research led universities and who also did not want to become one of the virtually research free populist universities. The decision to go ahead was based on cold logic. There was no extant myth. The decision by another university to adopt a civic vision was similar in many ways, except that the vision was stumbled upon accidentally at first and gradually built momentum and credence over time.
Gain approval for a change in mission	The decision to adopt FDAP offers an FE college increased revenue potential, reduced costs, portfolio flexibility and an enlarged reputation. The FE college was an early adopter. There was no extant myth.
Set up new institution	The new institutions were an academy and a UTC. These innovations offer an institution additional revenue streams and purposeful local connections. In addition, UTCs are believed to offer enhanced vocational education opportunities (although some politicians and academics have differing views).
Set up new centre	There was a business case for each of the four new centres (a flagship research centre, an SME information centre, a dedicated HE within FE centre and a dedicated land based centre). However, it could be argued that each had an element of following a sector bandwagon.
Establish vocational programme	Encouraged by the government to find new employer based funding streams, all the institutions in this thesis, both universities and FE colleges, have made a huge success in terms of revenue and reputation on the back of introducing new employer focussed vocational programmes. The exception was the teacher training programme, which was a major reform that was a compulsory government edict.
Develop teaching practice	Enhancing the student experience is as important to a TES institution as financial success. Considerable effort is taken to ensure teaching and learning improvements have a measurable impact on student performance. Improvements have the potential to be fads, but the three

Innovation type	Discussion
	innovations in this thesis appear to have had a real performance related purpose.
Implement technology enhanced learning	This category is similar to the previous one. At first TEL did have an element of copycat, but it has now been proved to be efficacious.
Develop partnership	This is a generic category. The automotive partnership could be regarded as more kudos than substance, but it made strategic sense. The two collaborative provision innovations involved foreign students. At the moment, foreign student ventures are considered good money spinners, although they do have some of the characteristics of bandwagons and eventually some may turn out to be risky diversions from the core mission.
Develop estate	New buildings are almost entirely funded by grants and offer increased operating efficiencies and student appeal. There could be an element of fashion statement about them, but not in the instances in this research
Restructure organisation	One institution in this research underwent two "mergers" to take over failing colleges. The aims were cost efficiencies, increased student performance and better local cohesion. These mergers were very successful. In the private sector, mergers are often problematical and do have a reputation for benefits which are often found to be mythical.

Source=Author

Secondly, from a **stakeholder's perspective**, are they impressed by an organisation's innovation strategy because it adopts a mythical standard design of organisation and practice or because on rational analysis it appears to be pursuing change offering performance gains. Table 10.4 assesses the attitudes of each of the stakeholder types in this thesis. Again, it can be seen that every one of the seven stakeholder types indicates being more impressed by performance gain than sector myth.

Table 10.4 Are respective stakeholders impressed by an organisation adopting innovations based on sector myths or demonstrable performance gains?

Stakeholder type	Discussion
Government	The government has sophisticated financial and quality benchmarks by which it assesses the performance of educational institutions. Ministers tend to focus new initiatives on high performing institutions.
Students	Although students could be influenced by reputation eg the Russell Group, today's students have considerable detailed objective information, not just simplistic league tables, to help them choose the right course/ institution.
Schools	Ditto, plus much more opportunity for visits.
Employers	Employers pick their educational supplier based on a track record of successful delivery and trust built up cumulatively over time, not on mythical status.
Educational partners	Ditto
Local agencies	Ditto
Suppliers	Suppliers will tend to deal with whoever can pay the bill.

Source=Author

The conclusion to be drawn from the above analysis, is that nowadays, (and perhaps this is very different from 30 years ago, when neo-institutional theory was first developed), organisations, whether in the private or public sector, routinely expect all investments to be justified by a formal business case. There is far more information and techniques available than there used to be in order to compile this business case. Although legitimacy (or reputation) may be a consideration in investment decisions, this is rarely enough (interviewees said "never enough") to outweigh a negative cost/ benefit appraisal – except in respect of a few innovations, where compliance with government regulations is a necessary condition to conduct business. Furthermore, because of the huge increase in the amount of, and accessibility to, information, the issue of uncertainty is far less relevant than is often suggested in the literature. Similarly, with the greater transparency of today, stakeholders have much better access to an institution's real performance information and rely less than before on public relations announcements concerning cosmetic achievements of mythical benefit – although students of Carillion and other failures might wish to qualify this optimism. This is not to say that seeking legitimacy from stakeholders is not relevant or important, as clearly it is often important. Furthermore, it is also not to say that sector bandwagons do not exist, as clearly they do. Rather, it is to say that in most circumstances, most of the time, institutional conforming pressures are trumped by

pressures to improve technical efficiency and to adapt to changing environmental circumstances.

10.3.3 Justification criteria specific to the UK TES

Having analysed the case study findings in depth, it is clear that the justification criteria developed from the literature review are too simplistic. The author has compiled a new set of justification criteria specifically applicable to the circumstances found in this thesis. These criteria are described in Table 10.5 and mapped to the ten innovation types in Table 10.6.

Table 10.5 New list of innovation justification criteria

Abbreviation	Justification criteria
STR	Major re-orientation of strategic direction
DEM	Future increase in student demand (revenue) and/or portfolio capacity
EFF	Measurable improvement in production efficiency or reduction in costs
STD	Improvement in the student experience – potentially measurable in terms of student demand (revenue) or that the cost of change can be afforded within the current budget
GOV	Strong intrinsic government expectations – either to adopt current government initiative or behaving like a 3rd way player – with likely government discretionary financial incentives
COM	Strong community expectations, including involvement of local employers
STH	Kudos with stakeholders for being an early adopter
LIC	Change needed to obtain/ retain licence to operate

Source=Author

Table 10.6 New innovation justification criteria mapped against ten innovation types

Justification Criteria ➔ Innovation type ⬇	STR	DEM	EFF	STD	GOV	COM	STH	LIC
Create vision	✓					✓		
Gain approval for a change in mission		✓	✓		✓		✓	
Set up new institution		✓		✓	✓	✓	✓	
Set up new centre		+		✓		+	✓	
Establish vocational programme		✓		✓	✓			
Develop teaching practice				✓	✓			
Implement technology enhanced learning		✓		✓	✓			
Develop partnership		+						+
Develop estate		✓	✓	✓		✓	✓	
Restructure organisation			✓	✓		✓	✓	

✓ indicates the criteria is present for all innovations within that type
+ indicates that the criteria is present for only one innovation within that type
Source=Author

There appears to be no logical pattern, for example linking clusters of related innovation types with clusters of related criteria. It would be instructive to rank each criterion for each innovation type and then to rank each innovation type. One would then have a systematic method of identifying the most important criteria. Further research would be needed to identify how robust this new list of innovation justification criteria would be in the TES and how they could be used to develop a general set of criteria applicable to other sectors.

10.4 STYLES OF COLLABORATION AND INNOVATION

10.4.1 Deriving the collaboration/ innovation style categories

It became apparent during the interviews that one could differentiate specific behavioural characteristics among interviewees with regard to their attitudes to collaboration and innovation respectively and that by co-joining these two attitudes, one could differentiate an overall collaboration/ innovation style. By the end of the 20 interviews, the styles described in this section had emerged. This was not part of the

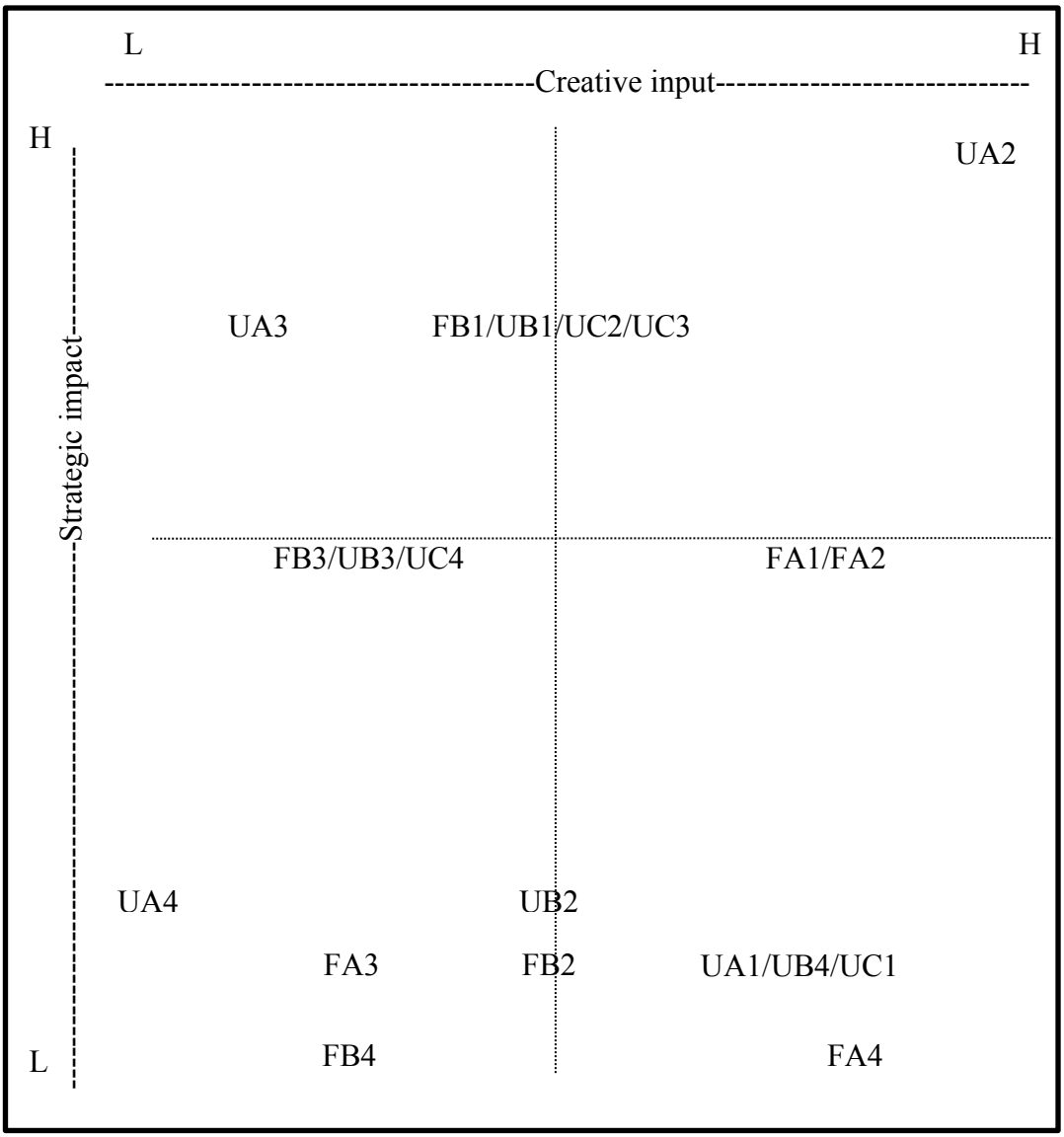
original purpose of the study, but is a spin off from the case study interview data. One would need a properly constituted research design and a larger sample to converge on a reliable categorisation. Nevertheless, it does represent an embryonic categorisation that is useful for analytical purposes in this research and might be built on in further research. One should also caveat the allocation of interviewees to these styles based on a mere one hour time slot.

The categorisation is based on two innovation dimensions and one collaboration dimension. The first innovation dimension relates to the strategic nature of the innovations they chose to cite during their interviews and their role in these innovations. In this regard, the strategic properties of an innovation are based on Figure 9.1 which maps innovation type against diffusion and infusion impact. For the purposes of this analysis, the two-dimensional matrix has been collapsed to one dimension – with infusion taking precedence over diffusion – ie a high impact in one important part of an institution being regarded as more strategic than a moderate impact throughout an institution. The second innovation dimension relates to how proactive and imaginative an interviewee has been – did they create a vision and make their own opportunities, or did they take someone else's vision and look for happenchance opportunities or were they pressured into a reaction by internal or external events? The collaboration dimension concerns whether interviewees were mainly eclectic, purposeful or entirely parochial in their collaboration. Eclectic collaborators network significantly with a host of external players and with most internal departments. Typically, they are boundary spanners linking the outside world to the inside world and vice versa. For the purposes of this analysis, they have been categorised as senior level or junior level boundary spanners. Purposeful collaborators tend to ensure that each contact has a measurable objective linked to specific operational priorities or current initiatives. Parochial collaborators are very reluctant networkers and prefer to rely on their own experience or expertise within their team.

The next few figures/ tables elaborate on these ideas. Figure 10.1 shows the cluster of interviewees according to the two strategic / creative innovation dimensions described in the previous paragraph. One senior manager, UA2, clearly spoke to an umbrella vision and individually created several significant opportunities, putting this person high up in the H/H quadrant. Four senior managers, FB1/UB1/UC2/UC3, were

involved in strategic innovations which they did not create themselves, but did grasp opportunistically and implement whole heartedly and with great skill. One senior manager, UA3, was difficult to position. This senior manager chose estates development as their innovation, although they played little part in it themselves. They mentioned in passing other innovations in their patch which they could have spoken to, but chose not to, indicating a less than enthusiastic attitude for those innovations. At a lower level of strategic impact, two faculty managers, FA1/FA2, did show evidence of creative thinking, and acted proactively and competently to opportunities in their area. On the other hand, three faculty managers, FB3/UB3/UC4, while reacting competently to significant opportunities in their areas, did not demonstrate any real evidence of imaginative thinking. The nine specialist managers, were involved in innovations of a less strategic impact and showed mixed degrees of imaginative thinking. UB2 and UA4 were staff development/ quality control managers, with the latter being not at all open to innovation. With regard to the TEL specialist managers, the university TEL managers, UA1/UB4/UC1, showed more evidence of imaginative thinking than the FE TEL managers, FA3/FB2. Finally, among the business developers, FA4 was very creative and FB4 much less so.

Figure 10.1 Interviewees according to strategic impact/ creative input



Turning to the second dimension, Table 10.7 shows the cluster of interviewees according to their eclectic/ purposive collaborative behaviours.

Table 10.7 Cluster of interviewees according to collaborative behaviour

Collaborative behaviour	Interviewee clusters
Eclectic collaboration – senior level boundary spanning	Senior managers - UA2/FB1/UB1/UC2/UC3
Eclectic collaboration – junior level boundary spanning	T&L and TEL managers - FA3/FB2/UA1/UB4/UC1/FA4/FB4
Purposeful collaboration	Faculty managers - FB3/UA3/UB3/UC4/FA1/FA2 and staff development manager - UB2
Parochial collaboration	Quality control manager - UA4

Source=Author

Putting the two dimensions together, one arrives at the mapping in Table 10.8

Table 10.8 Mapping of collaboration/ innovation styles to interviewee clusters

Collaboration/ innovation style	Interviewee clusters
Strategic Visionary	UA2
Strategic Opportunist	FB1/UB1/UC2/UC3
Functional Opportunist	FA1/FA2
Functional Reactionary	UB2/FB3/UA3/UB3/UC4
Fixer	FA3/FB2/UA1/UB4/UC1
Business developer	FA4/FB4
Parochialist	UA4

Source=Author

10.4.2 Defining the collaboration/ innovation style categories

A description of these styles is specified below.

A **STRATEGIC VISIONARY** (SV) creates a vision or takes responsibility for another's vision and creates / seeks out and develops innovative initiatives and policy changes that enact this vision. These people necessarily hold a very senior position within an institution and are high ranking and eclectic boundary spanners, who are noted and quoted by key players both inside and outside the institution.

A **STRATEGIC OPPORTUNIST** (SO) is a senior manager who buys into the corporate vision and whole heartedly seeks out opportunities that can enact this vision. They are also boundary spanners tending to operate through established channels.

A **FUNCTIONAL OPPORTUNIST** (FO) typically operates at senior faculty level and enthusiastically and imaginatively creates / seeks out and develops opportunities within their local vision, which they may well have created, and within the corporate vision. While performing a certain amount of eclectic boundary spanning, their collaborative energies are more focussed on purposeful agendas that focus on operational targets and the implementation of current new initiatives.

A **FUNCTIONAL REACTIONARY** (FR) also operates at faculty level. They typically are happy with the status quo. Nevertheless, more out of a sense of duty than belief, they will diligently plan for and implement initiatives and changes that arise from pressures from above or from outside the institution. Their collaboration will consist of formal routine boundary spanning within their patch and very focussed purposive implementation of formal agendas .

A **FIXER** (F) is typically a specialist manager who has responsibility for a cross-cutting function, such as T&L and TEL, but often little direct authority over faculties. They are middle level boundary spanners, continually seeking out best practice both internally and externally and then packaging this in a form ready for dissemination. They are particularly good at juxtaposing external good ideas with internal needs and problems.

A **BUSINESS DEVELOPER** (BD) has the prime purpose of increasing institutional income. Recently, this has tended to come from two main sources – employer engagement and international clients/ students. The best business developers are ones who develop strong account relationships with clients, moving up their value ladder, and imaginatively develop educational products that meet uniquely identified needs.

A **PAROCHIALIST** (P) perceives little need for external collaboration or innovation. They tend not to change without top-down or outside-in pressure. Typically, solutions to any problems would be found from within their own experience.

10.4.3 Analyses based on the collaboration/ innovation style (C/I style) categories

Three analyses have been developed from this categorisation.

10.4.3.1 C/I style categories mapped to type of institution and role of interviewee.

Table 10.9 counts the number in each category according to the type of institution and the level/ role of interviewee.

Table 10.9 – Innovator/ collaborator style according to type of institution and role of interviewee

Institution Type	Innovator/ collaborator type → Interviewee Level/ Role ↓	SV	SO	FO	FR	FIX	BD	P
University interviewees	Senior Managers	1	3		3			
	Specialist Managers				1	3		1
	Business Developers							
FE college interviewees	Senior Managers		1	2	1			
	Specialist Managers					2		
	Business Developers						2	

Source=Author

Note that SV, SO, FO, FIX and BD are proactive roles, while the remaining types are reactive roles.

There are three interesting patterns in this table. Firstly, all the visionaries, strategic opportunists and functional opportunists are senior managers. Perhaps, this might be expected as only senior managers might have the opportunity or the confidence to champion strategic innovations. However, looking at it the other way, 4 of 11 senior managers are not visionaries, strategic opportunists or functional opportunists – these are reactive and might be termed satisficers. Secondly, all the fixers are learning technology specialists. These people do considerable networking around specialist groups and pick up many ideas which they share as best practice. However, as might be expected at such a specialist level, these ideas are at a relatively low strategic level.

Finally, as might be expected, both business developers in respective FE colleges exhibited very similar characteristics – more like sales people.

10.4.3.2 C/I style categories mapped to innovation type

Table 10.10 maps innovator/ collaborator style to innovation types.

Table 10.10 – Innovator/ collaborator style according to innovation type

Innovator/ collaborator style ➔ Innovation type ⬇	I/D	SV	SO	FO	FR	FIX	BD	P
Create vision	H/H	0.5	1.0					
Mission change - FDAP	H/L				0.5			
New institution	H/L		1.3					
New centre	H/L		0.5	0.5	1.0			
Vocational programmes	H/L	0.5	0.7	1.0	0.5		2.0	
Teaching & learning practice	L/H				1.5	0.5		
Technology enhanced learning	L/H					4.5		
Partnerships	L/L		0.5		0.5			1.0
Estates	L/H				1.0			
Re-organisation - mergers	H/H			0.5				

Each interviewee is counted as 1.0 and allocated to each innovation type they spoke to. Source=Author

This table shows the mapping of collaborator/ innovation types against the innovation types used in this case study. The column I/D indicates the value of the innovation in Figure 9.1 in terms of being high or low infusion and high or low diffusion. So, for example, H/H indicates the innovation is of high infusion value and high diffusion value – in other words of very high strategic importance. The first pattern to note is that all the innovations for the strategic visionary and strategic opportunist categories are classified as high infusion (but not vice versa). Secondly, all fixer style innovations concern technology enhanced learning, and almost vice versa. Finally, both business developer style innovations are, as one might expect, vocational programmes.

10.4.3.3 C/I style categories mapped to the individual five institutions

Table 10.11 counts the number of interviewees of each style in each of the five institutions

Table 10.11 – Innovator/ collaborator style according to the individual five institutions

Innovator/ collaborator style ➔ Institutions ➔		SV	SO	FO	FR	FIX	BD	P
Universities	A	1			1	1		1
	B		1		2	1		
	C		2		1	1		
FE colleges	A			2		1	1	
	B		1		1	1	1	

Source=Author

The most interesting point is that the proportion of visionaries/ opportunists is approximately pro rata for universities and FE colleges.

10.5 PRACTICAL CONTRIBUTIONS FROM THIS RESEARCH

This section examines the practical advice that the research findings can offer to key TES players - government policy makers and university/ FE college senior managers, respectively.

10.5.1 Government policy

Universities and FE colleges receive a considerable proportion of their funding from the government. However, the role of the government is much more than merely the paymaster. Sections 9.4.2.1/2 of the Case Study chapter discuss at some length the influences that central and local government, core funding and regulatory agencies, educational agencies and development agencies have on university/ FE college innovation. These influences are summarised in Table 9.5 in terms of functional contributions and in Table 9.6 in terms of the benefits in each of the ten innovation types. The breadth and depth of support is impressive. It could be argued that without

the direction and/or funding and/or support from the various arms of government, most of the innovations described in this thesis would not have got off the ground. This applies to both university and FE college innovations. The message to the government is positive - keep up supporting the various agencies, keep up coming forward with new initiatives and, above all, keep up maintaining the level of financial support.

However, the message is not all positive. The feedback from the survey responses (especially the free-form comments) and case study interviewees, particularly those from the FE sector, is that there is concern about the frequency of policy changes, the reduction in funding (especially for adult training) and the poor implementation of initiatives, eg Train for Gain. Looking at the big picture, there was concern that there was no long term strategy for the funding of vocational training to improve the skills and productivity of UKplc and, in particular, the role of FE colleges vis-à-vis universities, vocational academies and private educational suppliers needed to be clarified.

10.5.2 Senior management

Leadership was not a specific focus of this research and consequently did not form a significant element in the survey or case study. However, it did emerge during the case study interviews as being important and is covered in the detailed descriptions of each innovation and is briefly focused on in Section 9.3.2 of the Case Study chapter.

Most of the innovations in this thesis were triggered by someone in the senior management team, often by the CEO themselves. This, perhaps, is not surprising as only strategic level innovations were selected for inclusion. Generally, three attributes were important – being able to spot opportunities (which, in turn, means networking so as to be in the right place at the right time), making a decision to go ahead (often needing courage) and being able to enthuse others in the senior management team.

The role of middle management – such as departmental heads and heads of teaching and learning – also emerged as being important. In this connection, the previous section concerning styles of collaboration and innovation is instructive. One can identify three types of collaborative activity that innovative TES managers employ.

The first type of collaborative activity is purposive and is associated with implementing new strategies. These strategies would include a targeted plan of action, probably including contact with key external players. For example, in setting up a UTC, this would include liaison with potential educational peer group providers and employer sponsors; and, in considering a new VLE, this would include liaison with candidate suppliers for options and government agencies for best practice. This type of collaboration is non-negotiable, inasmuch as the whole success of each strategy depends upon discipline in developing, and the associated quality, of the collaborative relationships. The second type of collaborative activity is semi-purposive and is associated with achieving ongoing operational targets. Preferably, there would also be a plan of action involving contact with external players. For example, this may include targeting feeder schools to encourage and monitor potential future students; or it may include targeting local large employers to keep abreast of their annual plans and the potential role of one's institution in achieving them. If an institution wishes to maintain/ increase demand and income, these contacts should also be non-negotiable, although the time spent on them is a matter of judgement. The third type of collaborative activity is eclectic and is associated with spotting opportunities. For example, it may be the opportunity to develop the curriculum based on a meeting with a sector skills council; or it may be the opportunity to learn how to get the most out of a new piece of software introduced at a national teaching and learning group meeting. A few of the innovations cited in this research began life in this way. Nevertheless, this type of collaborative activity needs the most judgement in assessing how worthwhile a particular channel is, rather than it being a mere talking shop.

The five institutions in the case study were selected because they were relatively successful in their respective peer groups. Having conducted the interviews, it was easy to see why they were successful. This is encapsulated in the following extract from Section 9.3.2, which describes four interviewees from one of the institutions:

"All four interviewees were knowledgeable, articulate and, above all, extremely enthusiastic with an obvious "can do" business oriented attitude – willing to make the best of whatever challenges they faced – be it changes in government policy, new organisational structures following a merger or the changing demographics and competitive landscape."

10.6 Summary of contributions made by this thesis

Box 10.1 Contributions made by this thesis

Description of the contribution
Concerning the influence of collaboration on innovation (C⇨I)
Quantitative confirmation of C⇨I. Unique robustness of quantitative approach – multi-item operationalisation of C and I and the incorporation of organisational and environmental controls.
Unique qualitative confirmation of C⇨I. Robust approach to selection of institutions, innovation spaces, interviewee types and interview framework.
Identification and quantitative and qualitative comparison of the relative influence of all major collaborator types on organisational innovation in the UK TES. Qualitative analysis of the functional mechanisms of how each emergent collaborator type contributes to innovation and the output benefits for each innovation type.
Evidence from the quantitative and qualitative research regarding the importance of collaboration as a source of innovation concepts vis-à-vis internally generated innovation concepts and public domain innovation concepts.
This is a rare study of C⇨I in the UK TES and includes detailed descriptions and analyses of the nature and relevance of collaboration and innovation. Analysis includes the organisational impact and the contribution of achieving corporate objectives, according to emergent innovation types as well as the functional and contributory analysis of collaborator types described above.
Insight into social capital theory regarding how innovative opportunities emanate from collaboration.
New methods, such as a new way of scoping and defining organisational innovation used in both the quantitative and qualitative research and a new framework for the innovation journey used in the qualitative research.
Concerning the relative influence of organisational learning vs institutional conforming on innovation
It is a unique idea to compare these two prominent schools of thought in an innovation context.
Development of criteria for assessing the respective influences of organisational learning and institutional conforming on innovation.
Strong quantitative and qualitative findings that organisation learning is strongly influential, and that institutional conforming is not influential, on organisational innovation in a UK tertiary education context.
Explanation of why there is such weak empirical evidence for institutional theory concepts.
Development of a set of comprehensive categories for the justification of organisational innovation in the UK TES.
Concerning collaborative/ innovative behavioural styles
Development of embryonic style categories based on the twin dimensions of collaborative and innovative behaviour in the UK TES.
Concerning the practical value of the findings in this thesis
Recommendation for government policy makers concerning support for innovation in the UK TES.
Implications for senior managers in the TES.

CHAPTER ELEVEN

CONCLUSION

11.1 INTRODUCTION

Existing theory relating to the research questions was comprehensively covered in the literature review chapters; findings relating to each of the research objectives was comprehensively covered in the survey and case study chapters; and the contributions made by this thesis were fully explored in the Discussion chapter. This chapter addresses the strengths and limitations of the research approach and the opportunities for further research.

11.2 STRENGTHS OF THE RESEARCH APPROACH IN THIS THESIS

The survey had a relatively high response rate and was demographically representative. The pilot and the responses to free form questions in the questionnaire indicate that the survey was understood by respondents. The questionnaire design and the appropriateness of the respondents produced meaningful data that met the research objectives; and the results were consistent. The case study design, organisation and conduct produced rich data capable of innovative analysis that comprehensively met the research objectives. The institutions were extremely co-operative and put forward very senior managers for interview. The semi-structured interviews were intensive and highly relevant. There was positive feedback from interviewees. The mixed methods research design worked well. Overall, the survey and case study provided distinctive perspectives and were mutually corroborative. In addition, the survey provided valuable data for the case study design.

11.3 LIMITATIONS OF THE RESEARCH APPROACH IN THIS THESIS

Limitations are examined under three headings: issues concerning concept scoping and definition; issues concerning the data in terms of the measurement of the concepts; and issues concerning the interpretation of the findings.

11.3.1 Issues concerning concept scoping and definition

This section concerns how comprehensively the breadth and depth of the major concepts in this thesis are covered in both the survey and case study.

With regard to Research Question 1, there are two major concepts – strategic innovative behaviour and collaborative behaviour. The theoretical scope and definition of strategic organisational innovation are analysed in Sections 2.2.2, 2.2.3 and 7.4.3.2. These analyses are both in depth and comprehensive and work well in presenting and analysing the empirical findings in Sections 8.3, 8.4 and 9.2. Collaborative behaviour is discussed in Section 2.4 and analysed/ defined in Table 5.2 in Section 5.1 and in Section 7.4.3.3. These analyses are also both in depth and comprehensive and work well in presenting and analysing the empirical findings in Sections 8.4 and 9.4. However, it could be argued that the breadth, or rather the granularity, of the concept collaborative behaviour is not as fully developed and analysed as that of strategic innovative behaviour. Dealing first with the survey, there are 54 items in the questionnaire relating to collaborative behaviour and the actual construct used in the statistical analysis consists of 30 items. These items have two main dimensions – collaborator type and nature of collaboration. The survey did identify a weakness in not giving sufficient weight to employers as a collaborative partner and this was rectified in the subsequent case study. Regarding the nature of collaboration, taking peer group partners as an example, the nature of collaboration consists of eight items, four relating to the intensity of contact eg frequency and element of trust and four items relating to the purpose of contact eg knowledge transfer or joint operations. As such, the construct is quite broad, given the constraints of the questionnaire size. What is lacking in the findings, is an analysis of the differential influence of the intensity of contact versus the purpose of contact. This does not affect the robustness of the findings, although it does affect their sensitivity and ability to offer a more granular

explanation. A further constraint is that the construct also omits two collaborative dimensions – firstly, the degree of formality of contact, which can range from ad hoc association to varying degrees of contractual joint venture – and, secondly, whether any collaborative relationship is strictly purposive and constructive or simply eclectic and serendipitous. These two dimensions would be interesting avenues for differential analysis of their respective influence on innovation. For example, combining these dimensions would produce the categories set out in Table 11.1. Consideration of such dimensions and categories could be useful avenues for further research.

Table 11.1 Embryonic collaborative categories

	Informal collaboration Ad hoc contact in a non-tied membership	**Formal collaboration** Set rules of engagement and tied membership
Constructive collaboration Focus on specific end product/ services or delivery improvements	OPEN INNOVATION	STRATEGIC ALLIANCES/ JOINT VENTURES
Eclectic collaboration Focus on general issues and best practice	INDUSTRY/ SECTOR ASSOCIATIONS	ADVANCED TECHNOLOGY NETWORKS (eg Catapults)

Turning to the case study, the focus is on the role and contribution of emergent collaborator types. Thus, it deals in detail with the purpose of the relationship, but not with the style or intensity of the relationship. This would have been an interesting topic and would have added to the richness of the findings. However, the omission does not affect the robustness of the specific findings and would have required much longer interviews.

With regard to Research Question 2, organisational learning and institutional conforming are complex concepts without universally accepted definitions or even scoping. The concepts are explored in depth in Chapter 3. With regard to the survey, the questionnaire survey focussed on Research Question 1. In fact, only one of the nine pages was earmarked for Research Question 2, which was, at that time, speculative. Consequently, the two constructs for organisational learning and institutional conforming each had only four items. Reducing complex concepts to such simplistic constructs could be an important limitation. The constructs were designed to incorporate the common features of the most notable writers in the respective fields.

Nevertheless, different writers may well have arrived at slightly different sets of indicators. In fact, the findings for organisational learning and institutional conforming are markedly in contrast to one another and hold for all contingencies and control variables. Furthermore, Cronbach's Alpha, after factor analysis, is satisfactory for each of the two constructs. In the circumstances, it is unlikely that the results would be materially different had the constructs been more complex or if the constituent items had been slightly different. With regard to the case study, the differential characteristics of organisational learning and institutional conforming are formulated in depth in Sections 5.2.2.2 and 9.6. The criticism of simplicity does not apply, except perhaps with the hindsight of alternative interpretation, as discussed later in this section under the heading "Issues concerning the interpretation of the findings".

Finally, and also with hindsight, in Section 10.2.3 there is a discussion concerning a possible minor fault with the questionnaire wording, concerning the positioning of collaboration as a "source" of innovative ideas. The questionnaire wording asks institutions "who developed the concepts for the innovation you specified" and gives options of in-house versus collaboration versus mainly out-of-house. The responses are heavily weighted to in-house rather than collaborative solutions. This contradicts the other findings in the survey and all the findings from the case study, which are all weighted to collaborative solutions. The reason for the contradiction is conjectured to be because the wording in respect of these other findings is focussed on the source of concepts and knowledge transfer rather than the development of concepts, per se. It is likely that while many innovative ideas emanate from partners or the sector, development of these ideas through to adoption is primarily an internal process. Thus, an explanation for the apparent contradictory results is because of the different words used to describe the phenomena. Further research would be needed to confirm this. This is a limitation.

11.3.2 Issues concerning the data in terms of the measurement of the concepts

This section concerns two issues with the data – firstly, there is a concern that the data relies on the perceptions of senior managers and, secondly, there are concerns with specific technical matters.

This research, both the survey and the case study, relies for its data on what is in senior managers' heads, ie on their perceptions. It is necessarily subjective and has several potential weaknesses. Do these managers understand what is being asked? Do they have the appropriate knowledge and authority, and can they remember what actually happened? Are they motivated to answer truthfully without exaggerating their institution's achievements or merely giving the corporate PR version of events? How do they interpret Likert mid-points? These questions point to very real potential weaknesses with this type of data gathering. Chapter 7 sets out why interview data was chosen and what steps were taken to minimise/ mitigate their weaknesses. The most important of these steps are summarised below.

Table 11.2 Mitigating the weaknesses of using data based on the perceptions of senior managers

Potential weakness = lack of…….	Survey	Case study
Understanding	Briefing note + careful questionnaire design and wording	Briefing note + one-on-one briefing + feedback of ideas during interview + total feedback of transcript after interview
Knowledge/ memory or authority	Initial letter to vice-chancellor who selected respondents	Participants selected by pro vice chancellor or deputy principal All participants were senior managers All innovations were chosen within the participant's sphere of authority There was a focus on innovations that occurred within the previous three years
Truthfulness	Some cross-referencing within the questionnaire – eg text-based responses	Participant statements were probed during the interview Notable achievements were corroborated where possible by checking with other participants and/or checking documents or web sites

A related problem is relying on statistics based on Likert scales. Different respondents are likely to interpret differently what each point in each scale means, unless they are

given clear referencing guidelines and the results are carefully calibrated. Furthermore, respondents often tick the mid-point value when they do not know the answer or have no opinion or do not care. Consequently, caution is needed in interpreting univariate statistics which are based on Likert scales, especially in attempting to give any meaning to absolute values. Fortunately, this research relies much more on covariate statistics, which consist of relative values rather than absolute values. Consequently, the problem is much less relevant, although still a possible limitation.

Notwithstanding these mitigating steps, data based on perceptions is subjective data and the potential weaknesses of such data must always be borne in mind when evaluating the findings.

A second type of problem with data measurement concerns technical issues with the survey. Firstly, in an ideal situation, the sample would be random. In this research, the sample is a volunteered sample, ie the whole population was canvassed, and participation was on a self-selection basis. This approach has theoretical weaknesses with the downside that a non-representative sample is unsuitable for generalisation to the population. However, the response rate was good, and the demographic profile of the sample matched the population on six key indicators. This gives a good idea that the sample is representative of the population. Secondly, the overall size of the sample is relatively low, particularly when assessing universities and FE colleges separately. This affect one's confidence in some of the statistical findings, particularly regarding the multivariate analyses. Thirdly, ideally, the variables used in the path analyses and multivariate analyses should be multiple item constructs. Whilst all the dependent and independent variables are multiple item constructs, some of the control variables are single item. These limitations are discussed in depth in Sections 8.6.3 and 8.7.11.

The final issue concerning data measurement concerns the number of institutions included in the research. Originally, it was hoped to have three universities and three FE colleges from different parts of the country. While five institutions responded positively, quickly and wholeheartedly to the invitation to participate, there was considerable difficulty in obtaining an FE college from the London / South East area. Five consecutive invitations were refused, due to institutional operational pressures. In the circumstances, the author considered that the existing 20 interviews were very rich

in content and that the findings were sufficiently saturated, ie new material was not adding significant new ideas to the analysis. Consequently, it was decided not to persevere with the quest for a third FE college. Since the case study findings consist of rich textual evidence rather than summary statistical evidence, it is likely that the data from additional institutions would likely lead to only minor augmentation of such textual evidence. On the other hand, of course, it is always possible that an additional institution might lead to new classes of findings and so this is a limitation.

11.3.3 Issues concerning the interpretation of the findings

This section discusses three possible limitations with the interpretation of the findings and consequent weaknesses with the basic models.

The first issue concerns the assumption in both the quantitative and qualitative research models that there is a causal link between collaboration and innovation, ie C ⇒ I. What does the data actually tell us?

The survey data is cross-sectional as opposed to longitudinal and cannot theoretically deduce causality. However, partial correlation analysis can indicate whether there is reverse feedback from I ⇒ C, please refer to Table 11.3.

Table 11.3 Partial correlation analyses concerning SIB, CB and OL

Relationship	Zero order correlation r	Control for	Partial correlation r
CB - SIB	.357***	OL	.185*
OL – SIB	.428***	CB	.319***
OL - CB	.494***	SIB	.404***

†p<.10, *p<.05, **p<.01, ***p<.001

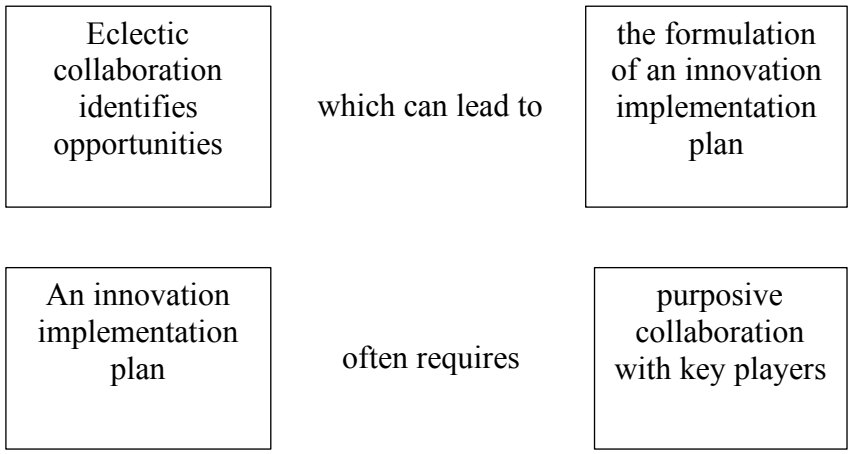
Source = fieldwork/ SPSS

These data show that OL is an important moderator of the relationship between CB and SIB and suggests that OL is a candidate to be an antecedent of both CB and SIB. This corroborates the findings in Section 8.5.6. These data also show that CB is a minor moderator of the relationship between OL and SIB and that SIB is a minor moderator

of the relationship between OL and CB. This suggests that the relationship between CB and SIB is bi-directional, ie C ⇔ I, and that the Survey Research Model, Figure 5.1, could be amended accordingly.

With regard to the case study data, a logical analysis of the findings as discussed in Chapter 10, indicates that there are two forms of collaboration – purposive and eclectic. Purposive and eclectic collaboration have the following forms:

Figure 11.1 Purposive and eclectic collaboration models

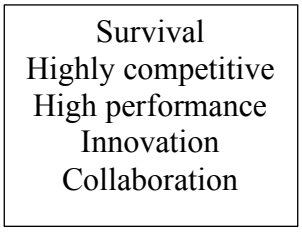


For example, a government organised senior management "away day" may raise the idea of setting up a UTC. This becomes a specific plan that requires detailed collaboration, and co-ordinated action, with local employers and other local education suppliers. In practice, the sequence of events would be more complex and iterative. For example, the formulation of an innovation implementation plan would first require a selection process involving both eclectic and purposive collaboration and the implementation of the plan itself would also involve both eclectic and purposive steps.

These models show that the sequence of action is different for each of the two types of collaboration, eclectic collaboration starts with collaboration and purposive collaboration starts with innovation. However, these models only refer to the sequence of actions. This does not imply causality.

Let us look at a hierarchy of means and ends relevant to the organisational world.

Figure 11.2 Hierarchy of means and ends



Each of these five layers can be means and/ or ends. The hierarchy implies that each layer is a means to the end above it: it does not cause it, but it is an enabler. Furthermore, there is an implied hierarchy of ends, with each layer being more important, in the long term, than the layer below it. In this sense, collaboration enables innovation, but not vice versa. As such, innovation is more important than collaboration. Again, this does not imply causality.

The above discussions tell us that one must be very careful with one's use of words to describe the relationship between collaboration and innovation and that the use of the term "cause" is not justified. In fact, in Research Question 1, the use of the word "influences" may be questionable. Perhaps all one can say is "associated with".

The second issue concerns the interpretation in Chapter 10 that the data shows that organisation learning is pre-dominant relative to institutional conforming. Again, what does the data tell us?

The survey data is clear and unambiguous. It says very markedly, that OL is pre-dominant compared with IC. The strength of the contrast in the findings between OL and IC and the way the indicators were derived from a consensus of leading writers, gives credence to the robustness of this finding. However, the simplicity of the constructs must be recognised as a limitation.

Turning to the case study, 31 innovations are categorised into 10 innovation types in Table 9.2. It could be argued that, in some sense, each one of these innovation types is

a sector norm - for example, that all bespoke vocational programmes for employers, however individually unique, are a sector norm. Similarly, with new research centres or new versions of technology enhanced learning. Indeed, it could be that in the early stages of the innovation journey, when scanning for or when evaluating opportunities, institutions consciously or unconsciously filter out any innovation that is an outlier and that does not belong to an established TES innovation type. Unfortunately, the research data is not detailed enough to assess whether this might be the case. This is a limitation. Notwithstanding the above, the research data certainly attests that all specific innovations have a business case justification and most follow organisational learning behavioural characteristics. Thus, it could be that innovation decision making is in fact a composite of IC and OL, ie IC in the early filtering stage and OL in the later stage of justifying and tailoring each specific innovation. Turning back to the survey results, and using the above interpretation, it could be that the strong contrast in the survey results could be explained by respondents conceptually having in their mind the specific innovations that they have tailored to their needs, rather to their respective generic innovation types, which may be sector norms.

It could also be argued that OL and IC overlap conceptually, in that the OL justification measure of technical efficiency and having to have a business case are in themselves business norms and, on the other hand, that to become aware of sector norms in order to use them, is itself a rational learning process.

An alternative angle on the OL versus IC debate, is a consideration of resource dependency theory. This concerns how one organisation is dependent upon scarce resources over which another organisation has discretionary control (Pfeffer & Salancik, 1978). Add a purpose to this discretional control and one has the basis for coercive institutional pressure, one of the three key institutional conforming behaviours. In some sense, as discussed in Section 10.2.4, this applies to FE colleges, which are much more heavily dependent on government funding compared with universities and which are consequently much more dependent on conforming to government policies compared with relatively autonomous universities.

The third issue concerns how far the specific circumstances of the research make the findings situation specific or whether they can be generalised to alternative settings.

For example, in order to have a thesis of manageable focus and size, the scope of institutions and innovations selected for the survey and case study were deliberately limited. With regard to the survey, Oxford and Cambridge colleges were omitted and the primary emphasis was on teaching and learning rather than pure or applied research. With regard to the case study, institutions were selected because of their perceived proactive innovative performance, positive value-added performance and positive stance on widening participation. Similarly, although 50% of the innovations were generally strategic, including pure and applied research, the other 50% were deliberately targeted at employer engagement and technology enhanced learning (two innovation categories highlighted by survey respondents). These scoping constraints in the survey and case study bias the findings and potentially reduce their generalisability. In particular, the focus on high performing institutions in the case study means the findings cannot be generalised to low performing institutions, whose behaviours may be very different.

Another example, is the time lag between the conduct of the survey in 2010, the conduct of the case study in 2012 and the publication of this thesis in 2017. Has anything happened in the sector to lessen the relevance of the findings? In fact, surprisingly little has changed. Total funding, the structure and number of institutions, number of students and the scope of the curriculum is much the same. The implications of The Browne Report (2010) have meant a change in the mix of university funding, but as yet, this has not meant wholesale changes in student choices. Similarly, there has not been the radical shake up in the direction and funding of FE colleges needed to improve the scale and quality of vocational education and training. Overall, there is a strong argument that the findings still hold, although there is the possibility of a limitation due to time lag.

Finally, it might be expected that different environmental circumstances might favour organisational learning more or less than institutional conforming. For example, organisational learning would be expected to be particularly prevalent in times of rapid technological advances or turbulent sector restructuring, whereas institutional conforming would be expected to be particularly prevalent in national systems with autocratic governments. Data representing these factors were not gathered or analysed in this research and as such the findings are correspondingly limited.

11.4 OPPORTUNITIES FOR FURTHER RESEARCH

One avenue for further research would be to broaden the scope of institutions in a qualitative case study. This could be envisaged in layers. The next layer would be to cover additional categories of UK tertiary education institutions, eg by involving low performing institutions as well as high performing ones or by including Russell Group universities and not just widening participation ones. The next layer would be to cover other public services such as health or policing. The final layer could include private service firms, of which there would be several categories. In this way, the generalisability of the theory could be extended layer by layer.

The thesis includes embryonic ideas for two separate categorisations: innovation justification criteria (Discussion chapter 10.3.3) and collaboration/ innovation management styles (Discussion chapter 10.4). Each of these topics could be the subject of research which would clarify the respective categorisations and seek to establish their efficacy.

Sections 2.4.7 and 2.5.2 demonstrate that existing literature is very weak in the theory or empirical evidence relating collaboration in professional networks and innovation. This would be a useful topic for further research.

Finally, there is very little evidence in this thesis of the existence of formal peer group alliances, as might be found in the private sector, except for relatively small scale collaborative provision between FE colleges and universities, ad hoc consortia assembled to make research bids and loose knit associations for the purposes of issue discussion and lobbying. The scope and benefits of such alliances would be a useful topic for research, although an alternative to empirical research would need to be devised, as there are very few extant examples.

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Please note that at the end of each reference, in square brackets, is the section (s) of the thesis where the reference is used.

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APPENDIX A

KEY FACTS AND FIGURES CONCERNING FE COLLEGES AND UNIVERSITIES

This section was written in 2012 and is approximately contemporary with the survey and case study research. A brief update is provided at the end of the appendix.

1. Universities and FE colleges – educational character

The main purpose of a university is to provide undergraduate and postgraduate education and research while the main purpose of an FE college is to provide vocational education and training from basic skills up to masters level. Universities and FE colleges are both subject to the Further and Higher Education Act 1992 and there are strict principles of governance. Both universities and FE colleges have the freedom to decide their educational character, their course portfolio and its mode of delivery and the type of students it enrols. However, FE colleges are effectively constrained in their academic freedom as they are only funded for courses and students which are deemed a priority at any given time by the Government. Universities and FE colleges can invest in their own assets and can form partnerships, but mergers have to be approved by the Government.

Students in the older universities, created in the 1960s or earlier, tend to fit the traditional model of young full-time students often resident on campus. On the other hand, a substantial proportion of students in the post-1992 universities are mature, part-time students and live and work in the local community. A higher proportion of students in the second model come from an ethnic minority background and would be categorised as widening participation. Nearly all FE students will live in the local community. Typically, there will be a very high ethnic minority and widening participation element – often over 50%. Students will often have financial and social problems as well as academic problems. Consequently, pastoral care is a large feature of FE colleges.

Although in recent years there has been the intention, in both universities and FE colleges, of emphasising learning as distinct from teaching, in reality this intention has been implemented much more rigorously in FE colleges. An FE lecturer has responsibility for final student outcomes: knowing one's subject is not enough.

2. Structure of the sector

The population of universities defined for this survey was 130. However, if one includes all the smaller and specialist higher education institutions, the number is about 165. In the UK, universities have been created in waves. The earliest wave consists of the seven "ancient" universities, created from about the 12th century. The second wave

consists of the 20 or so "civic" or "red brick" universities created from 1837 in the major cities in the UK. The third wave consists of the 20 or so following the expansion recommended in the Robbins Report of 1963. The fourth wave was the largest and consists of some 50 polytechnics and other higher education institutions which were re-classified as universities in the Further and Higher Education Act of 1992. Generally, older universities have a higher academic reputation than newer universities. The size of universities ranges from several with fewer than 1000 students and under £10 million income to the largest, the University of Manchester, with 40,000 students and an income of £800 million. The Open University is a special case and has 210,000 students.

According to the Association of Colleges, as of February 2012, there were 412 FE colleges in the UK, of which 345 are in England. Of these English colleges, 222 are general FE colleges. FE colleges are not categorized according to their age or how they were formed or how "elite" they are. Many are derived from technical colleges and arts colleges formed in the 19th century. They are almost entirely found in urban centres, with no equivalents of the out of town university campus. In size, they range from the smallest with under £5M income to the largest with 40,000 students and £100M income. So the largest FE college is similar to that of a small to medium sized university.

3. Key products and client groups

The following table compares the qualifications range for universities and FE colleges.

Table A.1 Comparison of qualifications for universities and FE colleges

Qualifications	Universities	FE colleges
NQF and QCF		✓
Apprenticeships		✓
FHEQ up to master's level	✓	✓
FHEQ doctoral level	✓	
Employer oriented short courses	✓	✓

NQF = National Qualification Framework
QCF = Qualifications and Credit Framework
FHEQ = Framework for Higher Education Qualifications
Source=author

The following table compares the student age range for universities and FE colleges, as well as two other relevant types of institution.

Table A.2 Comparison of student ages in universities and FE colleges

Age range	Universities	FE colleges	6th form colleges	Secondary schools
11-14				✓
14-16		✓		✓
16-18		✓	✓	✓
18+	✓	✓		

Source=author

It can been seen that there is an overlap of institutional provision at the 16-18 age range. What are called "general FE colleges" would typically include an integrated 6th form college. However, many 6th form colleges are stand alone (and are outside the scope of this research). FE colleges only teach specialist vocational subjects to 14-16 year olds who are already pupils of secondary schools (subsequently changed).

4. Number of students and income

The following table presents the estimated student numbers and income of each sector in 2009/10.

Table A.3 Comparison of student numbers and income of universities and FE colleges

	Universities (million) (Note 1)	FE colleges (million) (Note 2)
Number of students	2.5	3.0
Number of FTE students	2.0	1.2
Total income	£26.8 billion	£6.8 billion

Sources:
[1] "Higher education in facts and figures – Summer 2011" published by Universities UK
[2] "College key facts – Summer 2011" published by the Association of Colleges

Using these figures gives an estimated annual cost per FTE student of £13,100 for universities and £5,700 for FE colleges, respectively.

The sources of university income are as follows (pre Browne):

Table A.4 Sources of university income

Sources of income	Amount £ billion
Public funding bodies	9.0
Tuition fees and educational contracts	8.3
Research grants and contracts	4.4
Miscellaneous operational services eg residences	5.1

Source: Universities UK "Higher education in numbers"

The sources of FE college income are as follows:

Table A.5 Sources of FE college income

Sources of income	Amount £ billion
YPLA (16-18)	3.3
SFA (adult FE)	2.0
HE	0.14
Tuition fees (all clients)	0.7
Miscellaneous operational services	0.7

Source: AoC "College key facts"

5. Update using 2015/2016 statistics

1. The number of institutions and number of students is broadly the same as in 2012.

2 The total amount of funds for universities has increased from £26.8B to £33.2B. The sources of these funds has altered drastically:
   a) funding bodies from 34% to 16%
   b) tuition fees from 31% to 47%
   c) research grants from 16% to 18%
   d) other income stays at 19%.

2. The total amount of funds for FE colleges has fallen slightly: the sources and their respective contributions are broadly the same.

3. A surprise is the number of FE apprenticeships at 300,000 (10% of FE students). The publicity might have made one believe that this figure was much higher.

APPENDIX B

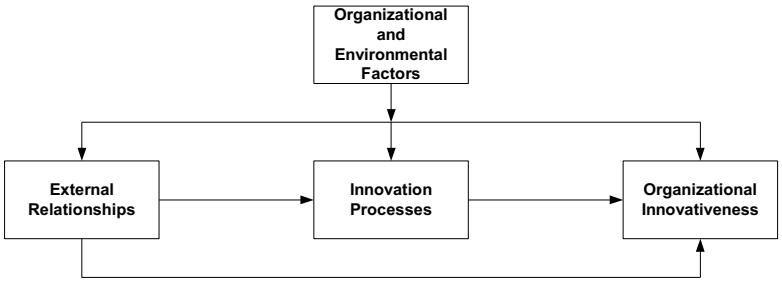
SURVEY QUESTIONNAIRE

Separate versions of the survey questionnaire were sent out to FE colleges and universities, respectively. The two versions had identical formats and identical items. The only differences were the respective uses of the terms FE colleges and universities. This is the university version. It has been reduced in physical size to fit into this thesis binding.

EXTERNAL INFLUENCES
ON
ORGANIZATIONAL INNOVATIVENESS

A SURVEY OF
INNOVATION IN THE MANAGEMENT OF TEACHING AND LEARNING
IN UK UNIVERSITIES

The questionnaire has four parts corresponding to the research model:



Pages 1-3 – Organizational Innovativeness – covers three major categories of innovation

1 Innovation concerning your educational services
2 Innovation concerning your educational delivery processes
3 Innovation concerning your business organization

Pages 4-7 – Institutional Partnerships – Page 4 covers key aspects of a broad spectrum of external relationships: Pages 5-7 cover three specific categories of external relationships

4 Spectrum of external relationships
5 Educational service providers
6 Government agencies
7 Professional networks

Page 8 – Innovation Processes – particularly related to decision making and experiential learning

Page 9 – Organizational and Environmental Factors

The focus of this survey is innovation in the management of teaching and learning. The survey is not concerned with a university's relationships and/or role in innovation connected with pure and applied research and industrial development.

This questionnaire is concerned with strategic level relationships and innovations. In this context, a strategic level relationship is defined as one that is deemed important enough to be monitored formally by the senior management team. A strategic level innovation is similarly defined.

Professor Reinhard Bachmann
School of Management
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March 2010

1 Innovation concerning your educational services

This series of questions concerns whether your institution has introduced **strategic** changes to your **educational services** in the last three years (irrespective of any external influence).

In each of the following three innovation categories, please tick the box that best indicates the degree of importance of innovative change within your institution.

Innovation Categories	Degree of Innovative Change						
	Extremely High						None
Q 1. New subject areas	☐	☐	☐	☐	☐	☐	☐
Q 2. New client groups	☐	☐	☐	☐	☐	☐	☐
Q 3. New course formats	☐	☐	☐	☐	☐	☐	☐

Please tick the most appropriate box.	Strongly Agree						Strongly Disagree
Q 4. Generally, such innovations have been successfully implemented and have achieved the expected benefits.	☐	☐	☐	☐	☐	☐	☐

Q 5. Please specify your institution's most significant innovation concerning **educational services** in the last three years, significant being defined as that innovation which has most transformed your business performance.

.....
.....

Q 6. Who developed the concepts for the innovation you specified in Q 5? Select the most appropriate option only.

Mainly your institution ☐

Your institution in collaboration with others ☐

Mainly other institutions ☐

2 Innovation concerning your educational delivery processes

This series of questions concerns whether your institution has introduced **strategic** changes to your **educational delivery processes** (including staffing and technological changes) in the last three years, (irrespective of any external influence).

In each of the following three innovation categories, please tick the box that best indicates the degree of importance of innovative change within your institution.

Innovation Categories	Degree of Innovative Change Extremely High						None
Q 1. New teaching and learning methods eg peer group reviews	☐	☐	☐	☐	☐	☐	☐
Q 2. New approaches to student monitoring or support eg measures to improve retention	☐	☐	☐	☐	☐	☐	☐
Q 3. New learning resources or facilities eg virtual environments	☐	☐	☐	☐	☐	☐	☐

Please tick the most appropriate box.	Strongly Agree						Strongly Disagree
Q 4. Generally, such innovations have been successfully implemented and have achieved the expected benefits.	☐	☐	☐	☐	☐	☐	☐

Q 5. Please specify your institution's most significant innovation concerning **educational delivery processes** in the last three years, significant being defined as that innovation which has most transformed your business performance.

.....
.....

Q 6. Who developed the concepts for the innovation you specified in Q 5? Select the most appropriate option only.

Mainly your institution ☐

Your institution in collaboration with others ☐

Mainly other institutions ☐

3 Innovation concerning your business organization

This series of questions concerns whether your institution has introduced **strategic** changes to your **business organization** in the last three years, (irrespective of any external influence).

In each of the following three innovation categories, please tick the box that best indicates the degree of importance of innovative change within your institution.

Innovation Categories	Degree of Innovative Change Extremely High						None
Q 1. New organization structure	☐	☐	☐	☐	☐	☐	☐
Q 2. New formal partnerships	☐	☐	☐	☐	☐	☐	☐
Q 3. New commercial approaches (eg concerning marketing or new income streams)	☐	☐	☐	☐	☐	☐	☐

Please tick the most appropriate box.	Strongly Agree						Strongly Disagree
Q 4. Generally, such innovations have been successfully implemented and have achieved the expected benefits.	☐	☐	☐	☐	☐	☐	☐

Q 5. Please specify your institution's most significant innovation concerning **business organization** in the last three years, significant being defined as that innovation which has most transformed your business performance.

.....
.....

Q 6. Who developed the concepts for the innovation you specified in Q 5? Select the most appropriate option only.

Mainly your institution ☐

Your institution in collaboration with others ☐

Mainly other institutions ☐

4 Your institution's spectrum of external relationships

This section explores your relationships with various categories of external organizations over the last three years.

Column 1 = If your institution has had formal dealings at least weekly with any organization in that category then tick the first half of the column. Otherwise, if your institution has had formal dealings several times per year with any organization in that category then tick the second half of the column. Otherwise, do not tick either boxes in this column.

Column 2 = Tick the box only if any organization in that category has been an important source of innovative ideas to your institution.

Column 3 = Tick the box only if your institution and another organization in that category have collaborated to a significant extent in innovation activities.

You may find it easier to tick the boxes column by column rather than line by line.

Categories of external organizations	Column 1: Formal dealings at least weekly	Column 1: Formal dealings several times per year	Column 2: Important source of innovative ideas	Column 3: Significant collaboration in innovation activities
P 1. Universities	☐	☐	☐	☐
P 2. Other educational service providers ..... eg colleges of further education	☐	☐	☐	☐
P 3. Employers and employer associations	☐	☐	☐	☐
P 4. Student groups	☐	☐	☐	☐
P 5. Central government and national agencies ..... eg HEFCE, SFC or HEFCW	☐	☐	☐	☐
P 6. Local government and local agencies ..... eg development agencies	☐	☐	☐	☐
P 7. Professional or sector networks and associations ...	☐	☐	☐	☐
P 8. Suppliers of education facilities and resources ..... eg electronic library content	☐	☐	☐	☐
P 9. Education researchers and consultants	☐	☐	☐	☐

5 Your relationships with educational service providers

Please identify how many strategic level relationships your institution has with educational service providers. Examples of educational service providers are universities, colleges of further education and 6th form colleges. For the purposes of this survey, a strategic level relationship is defined as one that is deemed important enough to be monitored formally by the senior management team.

Educational service providers	Approximate number of strategic relationships
Q 1. Universities	.....
Q 2. Other educational service providers eg further education colleges	.....

Q 3. What is the foremost reason why your institution develops strategic relationships with educational service providers?

.....

Q 4. Please specify an example, if there is one, where a relationship with an educational service provider has led to your institution making a significant innovation.

.....

.....

Your institution's strongest partnership

Please chose one of your institution's strongest partnerships with an educational service provider. For the purposes of this survey, the strength of a partnership is measured by frequency of contact, mutual trust and reciprocal benefit. With this partnership in mind, please answer the following questions.

Q 5. What type of educational service provider is this partner? .....

Q 6. How many years have you had a formal relationship with this partner? .....

In the following questions, please tick the most appropriate box.	Strongly Agree						Strongly Disagree
Q 7. There is a continual, interactive dialogue between our organizations.	☐	☐	☐	☐	☐	☐	☐
Q 8. There is contact between our organizations at all levels and in all functional areas.	☐	☐	☐	☐	☐	☐	☐
Q 9. Managers in both institutions have spent a lot of time and effort to maintain the partnership.	☐	☐	☐	☐	☐	☐	☐
Q10. We are both willing to make adjustments/ concessions in order to ensure a good operational fit.	☐	☐	☐	☐	☐	☐	☐
Q11. Our institution has learned to exchange skills and know-how with this partner.	☐	☐	☐	☐	☐	☐	☐
Q12. Our institutions routinely share resources.	☐	☐	☐	☐	☐	☐	☐
Q13. We often collaborate on new developments.	☐	☐	☐	☐	☐	☐	☐
Q14. Our institutions have learned to provide joint educational services.	☐	☐	☐	☐	☐	☐	☐

6 Your relationships with government agencies

This section is concerned with your relationships with agencies sponsored by local or central Government.

Please tick the most appropriate box.

	Strongly Agree						Strongly Disagree
Q 1. We are in a continual, interactive dialogue with one agency or another.	☐	☐	☐	☐	☐	☐	☐
Q 2. There is contact with these agencies at all levels and in all functional areas of our institution.	☐	☐	☐	☐	☐	☐	☐
Q 3. Generally, in relationships with these agencies, problems are readily shared and worked through in depth.	☐	☐	☐	☐	☐	☐	☐

Q 4. Please specify an example, if there is one, where such a relationship has led to your institution making a significant innovation.

.....

.....

In the following questions, please tick the most appropriate box.

	Strongly Agree						Strongly Disagree
Q 5. These agencies are very useful in facilitating the transfer of knowledge and best practice between institutions such as ourselves.	☐	☐	☐	☐	☐	☐	☐
Q 6. These agencies have encouraged and facilitated our institution in the development and implementation of our own innovative solutions.	☐	☐	☐	☐	☐	☐	☐
Q 7. Our institution often works with these agencies in the joint development of innovative solutions.	☐	☐	☐	☐	☐	☐	☐
Q 8. These agencies are helpful to our institution in facilitating the implementation of Government policy initiatives.	☐	☐	☐	☐	☐	☐	☐

7 Relationships with professional networks

This section concerns the role of professional networks, associations and unions in your institution's innovation activities. Specifically, this series of questions is concerned with the collaborative behaviour of your management and staff in matters concerning **innovation in the management and practice of teaching and learning.**

Please tick the most appropriate box.

	Strongly Agree						Strongly Disagree
Q 1. Professional networks are the best source for identifying commonly accepted standards for the management and practice of teaching and learning.	☐	☐	☐	☐	☐	☐	☐
Q 2. It is common practice for our management and staff to read professional journals and other material concerning the management and practice of teaching and learning.	☐	☐	☐	☐	☐	☐	☐
Q 3. It is common practice for our management and staff to attend professional courses or conferences concerning the management and practice of teaching and learning.	☐	☐	☐	☐	☐	☐	☐
Q 4. It is common practice for our management and staff to engage in informal contact with professional colleagues in other institutions in order to share knowledge and best practice.	☐	☐	☐	☐	☐	☐	☐
Q 5. It is common practice for our management and staff to participate in professional working groups with colleagues in other institutions in order to formulate innovative solutions to specific problems.	☐	☐	☐	☐	☐	☐	☐

8 Innovation Processes

This section concerns your innovation processes, particularly how you make decisions and how you learn from experience.

The following pairs of statements represent contrasting strategies. Tick the box which most reflects your institution's position.

Q 1. Innovations are always adopted when they have become standard practice in our sector.	☐ ☐ ☐ ☐ ☐ ☐ ☐	Innovations are adopted only after a comprehensive evaluation of our needs and a thorough evaluation of the business case.
Q 2. We only implement the commonly accepted standard form of innovations.	☐ ☐ ☐ ☐ ☐ ☐ ☐	We always test alternative innovation designs before adopting one that fits our specific circumstances.
Q 3. Strategic innovations are usually built around a single good idea.	☐ ☐ ☐ ☐ ☐ ☐ ☐	Strategic innovations usually emerge from the juxtaposition of several separate ideas.

In the following series of questions, please tick the most appropriate box.

	Strongly Agree						Strongly Disagree
Q 4. We are constantly scanning the external environment for opportunities to improve our performance.	☐	☐	☐	☐	☐	☐	☐
Q 5. We are continuously experimenting with new ways of doing things.	☐	☐	☐	☐	☐	☐	☐
Q 6. We routinely conduct post implementation reviews of all significant organizational change.	☐	☐	☐	☐	☐	☐	☐
Q 7. Staff are prepared to speak up about what works and what doesn't.	☐	☐	☐	☐	☐	☐	☐
Q 8. We tend to follow the innovative behaviour of leading institutions.	☐	☐	☐	☐	☐	☐	☐
Q 9. Before we consider an innovation, we tend to wait until it has been successfully implemented by most other institutions.	☐	☐	☐	☐	☐	☐	☐
Q10. The expectations of our stakeholders are important considerations when making innovation decisions.	☐	☐	☐	☐	☐	☐	☐
Q11. Many of our innovations are only adopted because they will improve our chances of meeting standards set by Government agencies or of obtaining Government funding.	☐	☐	☐	☐	☐	☐	☐

9 Organizational and environmental factors

Please tick the most appropriate box.	Strongly Agree						Strongly Disagree
Q 1. Over the last three years, we have increased our rate of innovation.	☐	☐	☐	☐	☐	☐	☐
Q 2. We would prefer to have a reputation for sound finances rather than for being innovative.	☐	☐	☐	☐	☐	☐	☐
Q 3. Staff are easily able to absorb the implementation of innovations alongside their existing workload.	☐	☐	☐	☐	☐	☐	☐
Q 4. This institution has a bold strategic vision which all of our staff find inspirational.	☐	☐	☐	☐	☐	☐	☐
Q 5. Staff are trusted to interpret and implement institution wide operational policies and practices in the spirit of our vision: written rules are only ever regarded as guidelines.	☐	☐	☐	☐	☐	☐	☐
Q 6. Generally in this institution, most of the best ideas for strategic innovation originate in the senior management team rather than in departmental teams.	☐	☐	☐	☐	☐	☐	☐
Q 7. There is a rich pattern of networking and collaboration between our departments.	☐	☐	☐	☐	☐	☐	☐
Q 8. Staff are generally more interested in maintaining the status quo than in seeking progressive change.	☐	☐	☐	☐	☐	☐	☐
Q9. The Chief Executive Officer necessarily plays a dominant role in instigating, developing and holding together strategic level partnerships.	☐	☐	☐	☐	☐	☐	☐
Q10. We find it difficult to keep up with the level of technological change.	☐	☐	☐	☐	☐	☐	☐
Q11. We face very strong competition in our sector.	☐	☐	☐	☐	☐	☐	☐
Q12 . Central Government introduce too many policy changes in our sector.	☐	☐	☐	☐	☐	☐	☐

Q13. What is your institution's total annual income? .....

Q14. Please add any additional comments you may wish to make concerning external relationships and/or innovative behaviour in your institution or your sector as a whole.

.....

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PLEASE CHECK THAT ALL QUESTIONS HAVE BEEN COMPLETED

APPENDIX C

POPULATION OF UNIVERSITIES USED IN THE SURVEY

Attached is the list of universities to whom a survey questionnaire was sent in March 2010. The criteria for inclusion is set out in Section 7.4.1.

ABERYSTWYTH UNIVERSITY
ANGLIA RUSKIN UNIVERSITY
ASTON UNIVERSITY
BANGOR UNIVERSITY
BATH SPA UNIVERSITY
BIRKBECK COLLEGE
BIRMINGHAM CITY UNIVERSITY
BISHOP GROSSETESTE UNIVERSITY COLLEGE LINCOLN
BOURNEMOUTH UNIVERSITY
BRUNEL UNIVERSITY
BUCKINGHAMSHIRE NEW UNIVERSITY
CANTERBURY CHRIST CHURCH UNIVERSITY
CARDIFF UNIVERSITY
COVENTRY UNIVERSITY
DE MONTFORT UNIVERSITY
DURHAM UNIVERSITY
EDGE HILL UNIVERSITY
EDINBURGH COLLEGE OF ART
EDINBURGH NAPIER UNIVERSITY
GLASGOW CALEDONIAN UNIVERSITY
GLASGOW SCHOOL OF ART
GLYNDŴR UNIVERSITY
GOLDSMITHS, UNIVERSITY OF LONDON
HARPER ADAMS UNIVERSITY COLLEGE
HERIOT-WATT UNIVERSITY
IMPERIAL COLLEGE OF SCIENCE, TECHNOLOGY AND MEDICINE
KEELE UNIVERSITY
KING'S COLLEGE LONDON
KINGSTON UNIVERSITY
LANCASTER UNIVERSITY
LEEDS METROPOLITAN UNIVERSITY
LEEDS TRINITY UNIVERSITY COLLEGE
LIVERPOOL HOPE UNIVERSITY
LIVERPOOL JOHN MOORES UNIVERSITY
LONDON METROPOLITAN UNIVERSITY
LONDON SCHOOL OF ECONOMICS AND POLITICAL SCIENCE
LONDON SOUTH BANK UNIVERSITY
LOUGHBOROUGH UNIVERSITY

MANCHESTER METROPOLITAN UNIVERSITY
MIDDLESEX UNIVERSITY
NEWCASTLE UNIVERSITY
NEWMAN UNIVERSITY COLLEGE
NORTHUMBRIA UNIVERSITY
NORWICH UNIVERSITY COLLEGE OF THE ARTS
NOTTINGHAM TRENT UNIVERSITY
OXFORD BROOKES UNIVERSITY
QUEEN MARGARET UNIVERSITY, EDINBURGH
QUEEN MARY, UNIVERSITY OF LONDON
QUEEN'S UNIVERSITY BELFAST
RAVENSBOURNE COLLEGE OF DESIGN AND COMMUNICATION
ROBERT GORDON UNIVERSITY
ROEHAMPTON UNIVERSITY
ROYAL HOLLOWAY, UNIVERSITY OF LONDON
SHEFFIELD HALLAM UNIVERSITY
SOUTHAMPTON SOLENT UNIVERSITY
ST GEORGE'S, UNIVERSITY OF LONDON
ST MARY'S UNIVERSITY COLLEGE, TWICKENHAM
STAFFORDSHIRE UNIVERSITY
SWANSEA METROPOLITAN UNIVERSITY
SWANSEA UNIVERSITY
TEESSIDE UNIVERSITY
THAMES VALLEY UNIVERSITY
THE ARTS UNIVERSITY COLLEGE AT BOURNEMOUTH
THE CITY UNIVERSITY
THE ROYAL VETERINARY COLLEGE
THE SCHOOL OF ORIENTAL AND AFRICAN STUDIES
THE UNIVERSITY COLLEGE PLYMOUTH ST MARK AND ST JOHN
THE UNIVERSITY OF ABERDEEN
THE UNIVERSITY OF ABERTAY DUNDEE
THE UNIVERSITY OF BATH
THE UNIVERSITY OF BIRMINGHAM
THE UNIVERSITY OF BOLTON
THE UNIVERSITY OF BRADFORD
THE UNIVERSITY OF BRIGHTON
THE UNIVERSITY OF BRISTOL
THE UNIVERSITY OF CENTRAL LANCASHIRE
THE UNIVERSITY OF CHICHESTER
THE UNIVERSITY OF DUNDEE
THE UNIVERSITY OF EAST ANGLIA
THE UNIVERSITY OF EAST LONDON
THE UNIVERSITY OF EDINBURGH
THE UNIVERSITY OF ESSEX
THE UNIVERSITY OF EXETER
THE UNIVERSITY OF GLASGOW
THE UNIVERSITY OF GREENWICH
THE UNIVERSITY OF HUDDERSFIELD
THE UNIVERSITY OF HULL
THE UNIVERSITY OF KENT
THE UNIVERSITY OF LEEDS
THE UNIVERSITY OF LEICESTER
THE UNIVERSITY OF LINCOLN

THE UNIVERSITY OF LIVERPOOL
THE UNIVERSITY OF MANCHESTER
THE UNIVERSITY OF NORTHAMPTON
THE UNIVERSITY OF NOTTINGHAM
THE UNIVERSITY OF PLYMOUTH
THE UNIVERSITY OF PORTSMOUTH
THE UNIVERSITY OF READING
THE UNIVERSITY OF SALFORD
THE UNIVERSITY OF SHEFFIELD
THE UNIVERSITY OF SOUTHAMPTON
THE UNIVERSITY OF ST ANDREWS
THE UNIVERSITY OF STIRLING
THE UNIVERSITY OF STRATHCLYDE
THE UNIVERSITY OF SUNDERLAND
THE UNIVERSITY OF SURREY
THE UNIVERSITY OF SUSSEX
THE UNIVERSITY OF THE WEST OF SCOTLAND
THE UNIVERSITY OF WALES, NEWPORT
THE UNIVERSITY OF WARWICK
THE UNIVERSITY OF WESTMINSTER
THE UNIVERSITY OF WINCHESTER
THE UNIVERSITY OF WOLVERHAMPTON
THE UNIVERSITY OF WORCESTER
THE UNIVERSITY OF YORK
UNIVERSITY CAMPUS SUFFOLK
UNIVERSITY COLLEGE BIRMINGHAM
UNIVERSITY COLLEGE FALMOUTH
UNIVERSITY COLLEGE LONDON
UNIVERSITY FOR THE CREATIVE ARTS
UNIVERSITY OF BEDFORDSHIRE
UNIVERSITY OF CHESTER
UNIVERSITY OF CUMBRIA
UNIVERSITY OF DERBY
UNIVERSITY OF GLAMORGAN
UNIVERSITY OF GLOUCESTERSHIRE
UNIVERSITY OF HERTFORDSHIRE
UNIVERSITY OF THE ARTS LONDON
UNIVERSITY OF THE WEST OF ENGLAND, BRISTOL
UNIVERSITY OF ULSTER
UNIVERSITY OF WALES INSTITUTE, CARDIFF
YORK ST JOHN UNIVERSITY
UNIVERSITY OF WALES TRINITY SAINT DAVID

APPENDIX D

POPULATION OF FE COLLEGES USED IN THE SURVEY

Attached is the list of the FE college to whom a survey questionnaire was sent in March 2010. The criteria for inclusion is set out in Section 7.4.1.

ENGLISH FE COLLEGES

ABINGDON AND WITNEY COLLEGE
ACCRINGTON AND ROSSENDALE COLLEGE
AMERSHAM & WYCOMBE COLLEGE
ASKHAM BRYAN COLLEGE
AYLESBURY COLLEGE
BARKING AND DAGENHAM COLLEGE
BARNET COLLEGE
BARNFIELD COLLEGE
BARNSLEY COLLEGE
BASINGSTOKE COLLEGE OF TECHNOLOGY
BEDFORD COLLEGE
BERKSHIRE COLLEGE OF AGRICULTURE
BEXLEY COLLEGE
BICTON COLLEGE
BIRMINGHAM METROPOLITAN COLLEGE
BISHOP AUCKLAND COLLEGE
BISHOP BURTON COLLEGE
BLACKBURN COLLEGE
BLACKPOOL AND THE FYLDE COLLEGE
BOLTON COMMUNITY COLLEGE
BOSTON COLLEGE
BOURNEMOUTH AND POOLE COLLEGE
BOURNVILLE COLLEGE OF FURTHER EDUCATION
BRACKNELL AND WOKINGHAM COLLEGE
BRADFORD COLLEGE
BRIDGWATER COLLEGE
BROCKENHURST COLLEGE
BROMLEY COLLEGE OF FURTHER AND HIGHER EDUCATION
BROOKLANDS COLLEGE

BROOKSBY MELTON COLLEGE
BURNLEY COLLEGE
BURTON COLLEGE
BURY COLLEGE
CALDERDALE COLLEGE
CAMBRIDGE REGIONAL COLLEGE
CANTERBURY COLLEGE
CAPEL MANOR COLLEGE
CARLISLE COLLEGE
CARSHALTON COLLEGE
CASTLE COLLEGE NOTTINGHAM
CENTRAL BEDFORDSHIRE COLLEGE
CENTRAL SUSSEX COLLEGE
CHELMSFORD COLLEGE
CHESTERFIELD COLLEGE
CHICHESTER COLLEGE
CIRENCESTER COLLEGE
CITY AND ISLINGTON COLLEGE
CITY COLLEGE BIRMINGHAM
CITY COLLEGE BRIGHTON AND HOVE
CITY COLLEGE COVENTRY
CITY COLLEGE NORWICH
CITY COLLEGE PLYMOUTH
CITY OF BATH COLLEGE
CITY OF BRISTOL COLLEGE
CITY OF SUNDERLAND COLLEGE
CITY OF WOLVERHAMPTON COLLEGE
CLEVELAND COLLEGE OF ART AND DESIGN
COLCHESTER INSTITUTE
COLLEGE OF NORTH WEST LONDON
COLLEGE OF WEST ANGLIA
CORNWALL COLLEGE
CRAVEN COLLEGE
DARLINGTON COLLEGE
DEARNE VALLEY COLLEGE
DERBY COLLEGE
DERWENTSIDE COLLEGE
DONCASTER COLLEGE
DUDLEY COLLEGE
EAST BERKSHIRE COLLEGE
EAST DURHAM COLLEGE
EAST RIDING COLLEGE
EAST SURREY COLLEGE
EASTLEIGH COLLEGE
EASTON COLLEGE
EPPING FOREST COLLEGE

EXETER COLLEGE
FAREHAM COLLEGE
FARNBOROUGH COLLEGE OF TECHNOLOGY
FILTON COLLEGE
FURNESS COLLEGE
GATESHEAD COLLEGE
GLOUCESTERSHIRE COLLEGE
GRANTHAM COLLEGE
GREAT YARMOUTH COLLEGE
GREENWICH COMMUNITY COLLEGE
GRIMSBY INSTITUTE OF FURTHER AND HIGHER EDUCATION
GUILDFORD COLLEGE
HACKNEY COMMUNITY COLLEGE
HADLOW COLLEGE
HALESOWEN COLLEGE
HARLOW COLLEGE
HARROW COLLEGE
HARTLEPOOL COLLEGE OF FURTHER EDUCATION
HAVERING COLLEGE OF FURTHER AND HIGHER EDUCATION
HARTPURY COLLEGE
HEREFORD COLLEGE OF ARTS
HEREFORDSHIRE COLLEGE OF TECHNOLOGY
HERTFORD REGIONAL COLLEGE
HIGHBURY COLLEGE
HOPWOOD HALL COLLEGE
HUGH BAIRD COLLEGE
HULL COLLEGE GROUP
HUNTINGDONSHIRE REGIONAL COLLEGE
JOSEPH PRIESTLEY COLLEGE
KENDAL COLLEGE
KENSINGTON AND CHELSEA COLLEGE
KIDDERMINSTER COLLEGE
KINGSTON COLLEGE
KINGSTON MAURWARD COLLEGE
KIRKLEES COLLEGE
LAKES COLLEGE
LAMBETH COLLEGE
LANCASTER AND MORECAMBE COLLEGE
LEEDS CITY COLLEGE
LEEDS COLLEGE OF ART AND DESIGN
LEEDS COLLEGE OF BUILDING
LEEK COLLEGE
LEICESTER COLLEGE
LEWISHAM COLLEGE
LINCOLN COLLEGE
LIVERPOOL COMMUNITY COLLEGE

LOUGHBOROUGH COLLEGE
LOWESTOFT COLLEGE
MACCLESFIELD COLLEGE
MID-CHESHIRE COLLEGE
MIDDLESBROUGH COLLEGE
MID-KENT COLLEGE
MILTON KEYNES COLLEGE
MOULTON COLLEGE
MYERSCOUGH COLLEGE
NELSON AND COLNE COLLEGE
NEW COLLEGE DURHAM
NEW COLLEGE NOTTINGHAM
NEW COLLEGE STAMFORD
NEW COLLEGE SWINDON
NEWBURY COLLEGE
NEWCASTLE COLLEGE
NEWCASTLE-UNDER-LYME COLLEGE
NEWHAM COLLEGE OF FURTHER EDUCATION
NORTH EAST SURREY COLLEGE OF TECHNOLOGY
NORTH EAST WORCESTERSHIRE COLLEGE
NORTH HERTFORDSHIRE COLLEGE
NORTH LINDSEY COLLEGE
NORTH NOTTINGHAMSHIRE COLLEGE
NORTH WARWICKSHIRE AND HINCKLEY COLLEGE
NORTH WEST KENT COLLEGE
NORTHAMPTON COLLEGE
NORTHBROOK COLLEGE
NORTHUMBERLAND COLLEGE
NORTON RADSTOCK COLLEGE
OAKLANDS COLLEGE
OLDHAM COLLEGE
ORPINGTON COLLEGE
OTLEY COLLEGE
OXFORD AND CHERWELL VALLEY COLLEGE
PETERBOROUGH REGIONAL COLLEGE
PETROC
PLUMPTON COLLEGE
PLYMOUTH COLLEGE OF ART AND DESIGN
PRESTON COLLEGE
REASEHEATH COLLEGE
REDBRIDGE COLLEGE
REDCAR AND CLEVELAND COLLEGE
RICHMOND ADULT AND COMMUNITY COLLEGE
RICHMOND UPON THAMES COLLEGE
RIVERSIDE COLLEGE
ROTHERHAM COLLEGE OF ARTS & TECHNOLOGY

ROYAL FOREST OF DEAN COLLEGE
RUNSHAW COLLEGE
SALFORD CITY COLLEGE
SANDWELL COLLEGE
SELBY COLLEGE
SHIPLEY COLLEGE
SHREWSBURY COLLEGE OF ARTS AND TECHNOLOGY
SKELMERSDALE & ORMSKIRK COLLEGE
SOLIHULL COLLEGE
SOMERSET COLLEGE OF ARTS AND TECHNOLOGY
SOUTH BIRMINGHAM COLLEGE
SOUTH CHESHIRE COLLEGE
SOUTH DEVON COLLEGE
SOUTH DOWNS COLLEGE
SOUTH ESSEX COLLEGE
SOUTH KENT COLLEGE
SOUTH LEICESTERSHIRE COLLEGE
SOUTH NOTTINGHAM COLLEGE
SOUTH STAFFORDSHIRE COLLEGE
SOUTH THAMES COLLEGE
SOUTH TYNESIDE COLLEGE
SOUTH WORCESTERSHIRE COLLEGE
SOUTHAMPTON CITY COLLEGE
SOUTHGATE COLLEGE
SOUTHPORT COLLEGE
SOUTHWARK COLLEGE
SPARSHOLT COLLEGE
ST HELENS COLLEGE
STAFFORD COLLEGE
STANMORE COLLEGE
STEPHENSON COLLEGE
STOCKPORT COLLEGE
STOCKTON RIVERSIDE COLLEGE
STOKE ON TRENT COLLEGE
STOURBRIDGE COLLEGE
STRATFORD-UPON-AVON COLLEGE
STROUD COLLEGE
SUSSEX COAST COLLEGE HASTINGS
SUSSEX DOWNS COLLEGE
SWINDON COLLEGE
TAMESIDE COLLEGE
TELFORD COLLEGE OF ARTS AND TECHNOLOGY
THANET COLLEGE
THE COLLEGE OF HARINGEY ENFIELD AND NORTH EAST LONDON
THE ISLE OF WIGHT COLLEGE
THE MANCHESTER COLLEGE

THE SHEFFIELD COLLEGE
TOWER HAMLETS COLLEGE
TRAFFORD COLLEGE
TRESHAM COLLEGE OF FURTHER AND HIGHER EDUCATION
TRURO AND PENWITH COLLEGE
TYNE METROPOLITAN COLLEGE
UXBRIDGE COLLEGE
WAKEFIELD COLLEGE
WALFORD AND NORTH SHROPSHIRE COLLEGE
WALSALL COLLEGE
WALTHAM FOREST COLLEGE
WARRINGTON COLLEGIATE
WARWICKSHIRE COLLEGE
WEST CHESHIRE COLLEGE
WEST HERTS COLLEGE
WEST KENT COLLEGE
WEST NOTTINGHAMSHIRE COLLEGE
WEST SUFFOLK COLLEGE
WEST THAMES COLLEGE
WESTMINSTER KINGSWAY COLLEGE
WESTON COLLEGE
WEYMOUTH COLLEGE
WIGAN AND LEIGH COLLEGE
WILTSHIRE COLLEGE
WIRRAL METROPOLITAN COLLEGE
WORCESTER COLLEGE OF TECHNOLOGY
YEOVIL COLLEGE
YORK COLLEGE

WELSH FE COLLEGES

BARRY COLLEGE
BRIDGEND COLLEGE
COLEG CEREDIGION
COLEG GLAN HAFREN
COLEG GWENT
COLEG LLANDRILLO
COLEG LLYSFASI
COLEG MEIRION-DWYFOR
COLEG MENAI
COLEG MORGANNWG
COLEG POWYS
COLEG SIR GAR
DEESIDE COLLEGE
GORSEINON COLLEGE
MERTHYR TYDFIL COLLEGE
NEATH PORT TALBOT COLLEGE
PEMBROKESHIRE COLLEGE
SWANSEA COLLEGE
YALE COLLEGE
YSTRAD MYNACH COLLEGE

SCOTTISH FE COLLEGES

ABERDEEN COLLEGE
ADAM SMITH COLLEGE
ANGUS COLLEGE
ANNIESLAND COLLEGE
AYR COLLEGE
BANFF AND BUCHAN COLLEGE
BARONY COLLEGE
BORDERS COLLEGE
CARDONALD COLLEGE
CARNEGIE COLLEGE
CENTRAL COLLEGE GLASGOW
CLYDEBANK COLLEGE
COATBRIDGE COLLEGE
CUMBERNAULD COLLEGE
DUMFRIES & GALLOWAY COLLEGE
DUNDEE COLLEGE
EDINBURGH'S TELFORD COLLEGE
ELMWOOD COLLEGE
FORTH VALLEY COLLEGE
GLASGOW COLLEGE OF NAUTICAL STUDIES
GLASGOW METROPOLITAN COLLEGE
INVERNESS COLLEGE
JAMES WATT COLLEGE
JEWEL & ESK COLLEGE
JOHN WHEATLEY COLLEGE
KILMARNOCK COLLEGE
LANGSIDE COLLEGE
LEWS CASTLE COLLEGE
MORAY COLLEGE
MOTHERWELL COLLEGE
NORTH GLASGOW COLLEGE
NORTH HIGHLAND COLLEGE
OATRIDGE COLLEGE
ORKNEY COLLEGE
PERTH COLLEGE
REID KERR COLLEGE
SHETLAND COLLEGE
SOUTH LANARKSHIRE COLLEGE
STEVENSON COLLEGE EDINBURGH
STOW COLLEGE
WEST LOTHIAN COLLEGE

APPENDIX E

COMMUNITY INNOVATION SURVEY QUESTIONNAIRE

The Community Innovation Survey 2006
(CIS 2006)

THE HARMONISED SURVEY QUESTIONNAIRE

The Community Innovation Survey 2006 **(Final Version: August 30 2006)**

This survey collects information about product and process innovation as well as organisational and marketing innovation during the three-year period 2004 to 2006 inclusive. Most questions cover new or significantly improved goods or services or the implementation of new or significantly improved processes, logistics or distribution methods. Organisational and marketing innovations are only covered in section 10. In order to be able to compare enterprises with and without innovation activities, we request all enterprises to respond to **all** questions, unless otherwise instructed.

Person we should contact if there are any queries regarding the form:

Name: _____
Job title: _____
Organisation: _____
Phone: _____
Fax: _____
E-mail: _____

General information about the enterprise

Name of enterprise _____
Address[1] _____
Postal code _____ **Main activity**[2] _____

1.1 Is your enterprise part of an enterprise group? (A group consists of two or more legally defined enterprises under common ownership. Each enterprise in the group may serve different markets, as with national or regional subsidiaries, or serve different product markets. The head office is also part of an enterprise group.)

Yes ☐ In which country is the head office of your group located? [3] _____

No ☐

If your enterprise is part of an enterprise group, please answer all further questions only for your enterprise in [your country]. Do not include results for subsidiaries or parent enterprises outside of [your country]

1.2 In which geographic markets did your enterprise sell goods or services during the three years 2004 to 2006?

	Yes	No
Local / regional within [your country]	☐	☐
National	☐	☐
Other European Union (EU) countries, EFTA, or EU candidate countries*	☐	☐
All other countries	☐	☐

*: Include the following countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Slovakia, Switzerland, Turkey, Spain, Sweden and the United Kingdom.

[1] NUTS 2 code
[2] NACE 4 digit code
[3] Country code according to ISO standard

2. Product (good or service) innovation

A product innovation is the market introduction of a **new** good or service or a **significantly** improved good or service with respect to its capabilities, such as improved software, user friendliness, components or sub-systems. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your sector or market. It does not matter if the innovation was originally developed by your enterprise or by other enterprises.

2.1 During the three years 2004 to 2006, did your enterprise introduce:

	Yes	No
New or significantly improved goods. (Exclude the simple resale of new goods purchased from other enterprises and changes of a solely aesthetic nature.)	☐	☐
New or significantly improved services.	☐	☐

If no to both options, go to question 3.1, otherwise:

2.2 Who developed these product innovations?

Select the most appropriate option only

Mainly your enterprise or enterprise group	☐
Your enterprise together with other enterprises or institutions	☐
Mainly other enterprises or institutions	☐

2.3 Were any of your goods and service innovations during the three years 2004 to 2006:

		Yes	No
New to your market?	Your enterprise introduced a new or significantly improved good or service onto your market before your competitors (it may have already been available in other markets)	☐	☐
Only new to your firm?	Your enterprise introduced a new or significantly improved good or service that was already available from your competitors in your market	☐	☐

Using the definitions above, please give the percentage of your total turnover[4] in 2006 from:

Goods and service innovations introduced during 2004 to 2006 that were **new to your market**	☐☐☐ %
Goods and service innovations introduced during 2004 to 2006 that were **only new to your firm**	☐☐☐ %
Goods and services that were **unchanged or only marginally modified** during 2004 to 2006 (include the resale of new goods or services purchased from other enterprises)	☐☐☐ %
Total turnover in 2006	1 0 0 %

[4] For Credit institutions: Interests receivable and similar income, for insurance services: Gross premiums written

3. Process innovation

A process innovation is the implementation of a **new** or **significantly** improved production process, distribution method, or support activity for your goods or services. The innovation (new or improved) must be new to your enterprise, but it does not need to be new to your sector or market. It does not matter if the innovation was originally developed by your enterprise or by other enterprises. Exclude purely organisational innovations.

3.1 During the three years 2004 to 2006, did your enterprise introduce:

	Yes	No
New or significantly improved methods of manufacturing or producing goods or services	☐	☐
New or significantly improved logistics, delivery or distribution methods for your inputs, goods or services	☐	☐
New or significantly improved supporting activities for your processes, such as maintenance systems or operations for purchasing, accounting, or computing	☐	☐

If no to all options, go to section 4, otherwise:

3.2 Who developed these process innovations?

Select the most appropriate option only

Mainly your enterprise or enterprise group	☐
Your enterprise together with other enterprises or institutions	☐
Mainly other enterprises or institutions	☐

4. Ongoing or abandoned innovation activities

Innovation activities include the acquisition of machinery, equipment, software, and licenses; engineering and development work, training, marketing and R&D[5] when they are *specifically* undertaken to develop and/or implement a product or process innovation.

4.1 Did your enterprise have any innovation activities to develop product or process innovations that were abandoned during 2004 to 2006 or still ongoing by the end of 2006?

Yes ☐

No ☐

If your enterprise had no product or process innovations or innovation activity during 2004 to 2006 (no to all options in questions 2.1, 3.1, and 4.1), go to question 8.2.

Otherwise, go to question 5.1

[5] Include basic R&D as an innovation activity even if not specifically related to a product and/or process innovation

5. Innovation activities and expenditures

5.1 During the three years 2004 to 2006, did your enterprise engage in the following innovation activities:

		Yes	No
Intramural (in-house) R&D	Creative work undertaken within your enterprise to increase the stock of knowledge and its use to devise new and improved products and processes (including software development) If yes, did your firm perform R&D during 2004 to 2006: Continuously? ☐ Occasionally? ☐	☐	☐
Extramural R&D	Same activities as above, but performed by other companies (including other enterprises within your group) or by public or private research organisations and purchased by your enterprise	☐	☐
Acquisition of machinery, equipment and software	Acquisition of advanced machinery, equipment and computer hardware or software to produce new or significantly improved products and processes	☐	☐
Acquisition of other external knowledge	Purchase or licensing of patents and non-patented inventions, know-how, and other types of knowledge from other enterprises or organisations	☐	☐
Training	Internal or external training for your personnel specifically for the development and/or introduction of new or significantly improved products and processes	☐	☐
Market introduction of innovations	Activities for the market introduction of your new or significantly improved goods and services, including market research and launch advertising	☐	☐
Other preparations	Procedures and technical preparations to implement new or significantly improved products and processes that are not covered elsewhere.	☐	☐

5.2 Please estimate the amount of expenditure for each of the following four innovation activities in 2006 only. (Include personnel and related costs)[6]

If your enterprise had no expenditures in 2006 please fill-in 0

Intramural (in-house) R&D (Include capital expenditures on buildings and equipment specifically for R&D)	
Acquisition of R&D (extramural R&D)	
Acquisition of machinery, equipment and software (Exclude expenditures on equipment for R&D)	
Acquisition of other external knowledge	
Total of these four innovation expenditure categories	

[6] Give expenditure data in 000's of national currency units to eight digits.

5.3 During the three years 2004 to 2006, did your enterprise receive any public financial support for innovation activities from the following levels of government? Include financial support via tax credits or deductions, grants, subsidised loans, and loan guarantees. Exclude research and other innovation activities conducted entirely for the public sector under contract.

	Yes	No
Local or regional authorities	☐	☐
Central government (including central government agencies or ministries)	☐	☐
The European Union (EU)	☐	☐
If yes, did your firm participate in the EU 6th Framework Programme for Research and Technical Development (2003-2006)	☐	☐

6. Sources of information and co-operation for innovation activities

6.1 During the three years 2004 to 2006, how important to your enterprise's innovation activities were each of the following information sources? Please identify information sources that provided information for new innovation projects or contributed to the completion of existing innovation projects.

		Degree of importance			
		Tick 'not used' if no information was obtained from a source.			
	Information source	**High**	**Medium**	**Low**	**Not used**
Internal	Within your enterprise or enterprise group	☐	☐	☐	☐
Market sources	Suppliers of equipment, materials, components, or software	☐	☐	☐	☐
	Clients or customers	☐	☐	☐	☐
	Competitors or other enterprises in your sector	☐	☐	☐	☐
	Consultants, commercial labs, or private R&D institutes	☐	☐	☐	☐
Institutional sources	Universities or other higher education institutions	☐	☐	☐	☐
	Government or public research institutes	☐	☐	☐	☐
Other sources	Conferences, trade fairs, exhibitions	☐	☐	☐	☐
	Scientific journals and trade/technical publications	☐	☐	☐	☐
	Professional and industry associations	☐	☐	☐	☐

6.2 During the three years 2004 to 2006, did your enterprise co-operate on any of your innovation activities with other enterprises or institutions? Innovation co-operation is active participation with other enterprises or non-commercial institutions on innovation activities. Both partners do not need to commercially benefit. Exclude pure contracting out of work with no active co-operation.

Yes ☐
No ☐ (**Please go to question 7.1)**

6.3 Please indicate the type of co-operation partner and location *(Tick all that apply)*

Type of co-operation partner	[Your country]	Other Europe*	United States	All other countries
A. Other enterprises within your enterprise group	☐	☐	☐	☐
B. Suppliers of equipment, materials, components, or software	☐	☐	☐	☐
C. Clients or customers	☐	☐	☐	☐
D. Competitors or other enterprises in your sector	☐	☐	☐	☐
E. Consultants, commercial labs, or private R&D institutes	☐	☐	☐	☐
F. Universities or other higher education institutions	☐	☐	☐	☐
G. Government or public research institutes	☐	☐	☐	☐

*: Include the following European Union (EU) countries, EFTA, or EU candidate countries: Austria, Belgium, Bulgaria, Croatia, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Italy, Ireland, Latvia, Liechtenstein, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Romania, Slovenia, Slovakia, Switzerland, Turkey, Spain, Sweden and the United Kingdom.

6.4 Which type of co-operation partner did you find the most valuable for your enterprise's innovation activities? (Give corresponding letter) _____

7. Effects of innovation during 2004-2006

7.1 How important were each of the following effects of your product (good or service) and process innovations introduced during the three years 2004 to 2006?

		Degree of observed effect			
		High	Medium	Low	Not relevant
Product oriented effects	Increased range of goods or services	☐	☐	☐	☐
	Entered new markets or increased market share	☐	☐	☐	☐
	Improved quality of goods or services	☐	☐	☐	☐
Process oriented effects	Improved flexibility of production or service provision	☐	☐	☐	☐
	Increased capacity of production or service provision	☐	☐	☐	☐
	Reduced labour costs per unit output	☐	☐	☐	☐
	Reduced materials and energy per unit output	☐	☐	☐	☐
Other effects	Reduced environmental impacts or improved health and safety	☐	☐	☐	☐
	Met regulatory requirements	☐	☐	☐	☐

8. Factors hampering innovation activities

8.1 During the three years 2004 to 2006 were any of your innovation activities or projects:

	Yes	No
Abandoned in the concept stage	☐	☐
Abandoned after the activity or project was begun	☐	☐
Seriously delayed	☐	☐

TO BE ANSWERED BY ALL ENTERPRISES:

8.2 During the three years 2004 to 2006, how important were the following factors for hampering your innovation activities or projects or influencing a decision not to innovate?

		Degree of importance			
		High	Medium	Low	Factor not experienced
Cost factors	Lack of funds within your enterprise or group	☐	☐	☐	☐
	Lack of finance from sources outside your enterprise	☐	☐	☐	☐
	Innovation costs too high	☐	☐	☐	☐
Knowledge factors	Lack of qualified personnel	☐	☐	☐	☐
	Lack of information on technology	☐	☐	☐	☐
	Lack of information on markets	☐	☐	☐	☐
	Difficulty in finding cooperation partners for innovation	☐	☐	☐	☐
Market factors	Market dominated by established enterprises	☐	☐	☐	☐
	Uncertain demand for innovative goods or services	☐	☐	☐	☐
Reasons not to innovate	No need due to prior innovations	☐	☐	☐	☐
	No need because of no demand for innovations	☐	☐	☐	☐

9. Intellectual property rights

9.1 During the three years 2004 to 2006, did your enterprise:

	Yes	No
Apply for a patent	☐	☐
Register an industrial design	☐	☐
Register a trademark	☐	☐
Claim copyright	☐	☐

10. Organisational and marketing innovations

An organisational innovation is the implementation of new or significant changes in firm structure or management methods that are intended to improve your firm's use of knowledge, the quality of your goods and services, or the efficiency of work flows. A marketing innovation is the implementation of new or significantly improved designs or sales methods to increase the appeal of your goods and services or to enter new markets.

10.1 During the three years 2004 to 2006, did your enterprise introduce:

		Yes	No
Organisational innovations	New or significantly improved knowledge management systems to better use or exchange information, knowledge and skills within your enterprise	☐	☐
	A major change to the organisation of work within your enterprise, such as changes in the management structure or integrating different departments or activities	☐	☐
	New or significant changes in your relations with other firms or public institutions, such as through alliances, partnerships, outsourcing or sub-contracting	☐	☐
Marketing innovations	Significant changes to the design or packaging of a good or service (Exclude routine/ seasonal changes such as clothing fashions)	☐	☐
	New or significantly changed sales or distribution methods, such as internet sales, franchising, direct sales or distribution licenses.	☐	☐

10.2 If your enterprise introduced an organisational innovation during the three years 2004 to 2006, how important were each of the following effects?

	Degree of observed effect			
	High	**Medium**	**Low**	**Not relevant**
Reduced time to respond to customer or supplier needs	☐	☐	☐	☐
Improved quality of your goods or services	☐	☐	☐	☐
Reduced costs per unit output	☐	☐	☐	☐
Improved employee satisfaction and/or reduced rates of employee turnover	☐	☐	☐	☐

11. Basic economic information on your enterprise

11.1 What was your enterprise's total turnover for 2004 and 2006?[7] Turnover is defined as the market sales of goods and services (Include all taxes except VAT[8]).

2004 ☐☐☐☐☐☐☐☐☐ **2006** ☐☐☐☐☐☐☐☐☐

11.2 What was your enterprise's total number of employees in 2004 and 2006?[9]

2004 ☐☐☐☐☐☐ **2006** ☐☐☐☐☐☐

[7] Give turnover in '000 of national currency units to nine digits.

[8] For Credit institutions: Interests receivable and similar income; for Insurance services: Gross premiums written

[9] Annual average. If not available, give the number of employees at the end of each year. Give figures to six digits.

APPENDIX F

SURVEY COVERING LETTER

A personalised covering letter, explaining the survey and requesting completion of the questionnaire, was sent to all chief executive officers (vice-chancellors / principals) of the targeted universities and FE colleges. There were university and FE college versions, which differed very slightly. The university version, with salutations removed, is attached.

UNIVERSITY OF SURREY

Faculty of
Management and Law

Guildford, Surrey GU2 7XH UK

April 2010

For the attention of:

Dear Professor

I am conducting research concerning the influence of partnerships and other external relationships on the innovativeness of UK universities and colleges. Part of the research includes the attached survey questionnaire.

The research focus is innovation in the management of teaching and learning, a relatively under researched topic compared with the role of universities in the application of research to industrial innovation. However, in these challenging times, when a highly knowledgeable and capable workforce is crucial for the UK's competiveness and when the mantra is "more for less", innovation and flexibility in the provision of tertiary level education is more important than ever. Partnerships and external relationships are often cited as a positive influence on innovativeness. My research will explore the empirical basis for any such influence. As well as furthering theoretical knowledge, it is hoped that the results of the research will be of practical use to policy makers and university management teams and might raise the profile of the innovative behaviour of universities.

The nature of my questions requires an understanding at a strategic level of the pressures, opportunities, decision making, experiential learning, external relationships and innovative behaviour of your university and this is why the survey has been addressed to yourself as the chief executive. I would be most grateful if you could arrange for the survey to be completed either by yourself or by a member of your senior management team, ideally an executive with an awareness of your institution's track record in strategic innovation in teaching and learning and of handling strategic collaborative partnerships concerning teaching and learning provision. The individual completing the questionnaire should remain anonymous within the response. A Freepost envelope is enclosed for your convenience. In the pilot, the typical time to complete this questionnaire was between 15 to 20 minutes.

Raw survey data for each university will be combined with demographic data in the public domain. The published results of the survey will be in aggregate form and will not contain references to any named university or college. Later, case study data will be added in respect of selected universities, who will also remain anonymous. Data will be stored securely and will be kept confidential. The results of the research will be published in the form of academic papers. A copy of the results will be made available to all those who contribute. This project has been given a favourable ethical opinion by the University of Surrey Ethics Committee.

If you have any queries, please do not hesitate to contact one of the researchers named below. I am most grateful for your co-operation.

Yours sincerely

James Carter

James Carter, Researcher J.Carter@surrey.ac.uk
Professor Reinhard Bachmann, Chair of Strategy, School of Management
R.Bachmann@surrey.ac.uk

Accredited by Association of MBAs

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APPENDIX G

CASE STUDY COVERING LETTER

A personalised covering, explaining the case study and requesting participation, was sent to all chief executive officers (vice-chancellors / principals) of five targeted universities and FE colleges. There were university and FE college versions, which differed very slightly. The university version, with salutations and reference to the name of the university removed, is attached.

UNIVERSITY OF SURREY

Faculty of
Management and Law

Guildford, Surrey GU2 7XH UK

For the attention of

13th June 2012

Dear Professor

I am conducting research concerning the effect of partnerships and other external influences on innovation in UK colleges and universities. very kindly contributed to a survey that I conducted in 2010. This is now being followed up with a short series of interviews with a small number of selected colleges and universities. I should be most grateful if you would kindly approve participation in this further study.

In these challenging times, innovation and flexibility in the provision of tertiary level education is more important than ever. Partnerships and other external influences are often cited as having a positive effect on innovativeness. My research is exploring the empirical basis for any such effect. The research focus is on innovation in the management of teaching and learning and specifically on decision making during the innovation journey. As well as furthering theoretical knowledge, it is hoped that the results of the research will be of practical use to policy makers and university management teams and might raise the profile of the innovative behaviour of universities.

Of the colleges and universities which responded to the survey, six have been selected for this second stage on the basis of your responses and, especially in the case of because of your relevant characteristics and notable reputation in my area of interest. It is proposed to conduct four interviews in each institution – one with the Pro-Vice-Chancellor for Teaching & Learning (or equivalent), one with the dean of a school of study and two interviews which focus on two specific areas of university activity – employer engagement and technology enhanced learning, respectively. It is planned that each interview will be for one hour.

With your approval, I would like to arrange the interviews with a designated contact of yours. The interviews will be conducted by Mr James Carter, a mature PhD student, under the supervision of Professor Reinhard Bachmann, Chair of Strategy.

Data will be stored securely and will be kept confidential. The results of the overall study will be published in the form of academic papers, which will not contain references to any named university or individual. A copy of the results will be made available to all those who contribute. This project has been given a favourite ethical opinion by the University of Surrey Ethics Committee.

I should be most grateful if you would kindly advise your willingness to participate to j.carter@surrey.ac.uk If you have any queries, please do not hesitate to contact one of the researchers named below. I am most grateful for your co-operation.

Your sincerely James Carter

James Carter, Researcher
Professor Reinhard Bachmann, Chair of Strategy, Surrey Business School

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APPENDIX H

EXAMPLE OF INTERVIEW THEMATIC CODING FOR THE CASE STUDY

This appendix gives an example of the thematic coding of interviews used in the case study analysis – please see Section 7.5.4. The first exhibit is the original interview transcript, with the text separated into chunks of logical data, each on a single topic; with each chunk annotated with its associated codes; and with each chunk sorted in code sequence. The second exhibit is the original interview transcript. Both exhibits have been redacted to preserve anonymity.

Exhibit 1 Interview transcript annotated with, and sorted by, codes

Note that general statements may have one or more codes blank.

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
You have a plethora of innovative activities in your [redacted] brochures	UB1			
You have got graduate advantage, knowledge transfer partnerships, [redacted] small businesses programme	UB1			
Are you a civic University we have strong values and ethics-we believe as well as being an international and national University that we fully engage with our community half of our undergraduate population comes from the [redacted]	UB1			
I read somewhere that you are represented on 120 institutions	UB1			
Definition of innovation-it's about taking what exists and making it useful for you-not about the Eureka moment	UB1			
There are lots of other innovations like the VLE, central placement officers, third stream knowledge transfer, PG cert, [redacted] peer entry	UB1			
Another innovation is the Aston University Academy for 14 to 19-year-olds It is a University technical College	UB1	UTC		
There is a huge number of initiatives-I'll leave the central placement office because we have had that years another innovation is our [redacted] small businesses scheme for SMEs	UB1	SME Prog		

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
[redacted] and ourselves are the three at the moment and it has just started in London it is a programme for entrepreneurs that are at the cusp of growth so you have to be in between incubator and initiation it is fully funded by [redacted] Typically an organisation would have between six and 80 employees It is a bespoke programme we can use these regional entrepreneurs to mentor our own students and our students in the Academy and the entrepreneurs are doing business with each other and so there are spin-offs They are across the piece in HR marketing and IT	UB1	SME Prog		
There are between 20 and 25 students on each iteration-we have had three iterations-the plan is to do two or three iterations every year for a five-year period Each iteration is about three months long consisting of 12 sessions-they get business mentors and modules on HR marketing planning business development etc	UB1	SME Prog		
It is very competitive to get on the scheme	UB1	SME Prog		
We were a very traditional University-if you go back seven years [redacted] always had a placement year-but we didn't do bespoke programmes for employers or foundation degrees	UB1	Employer engagement		
We collaborate with local agencies for economic regional regeneration-and through our knowledge transfer partnerships-our engagement with employers in the design of the curriculum across all our programmes-and we want our graduates to remain in [redacted] and they have placements in [redacted] and projects in [redacted]-this is especially appropriate for our [redacted] women so to get a graduate status job, it helps for our students to be really well networked	UB1	Employer engagement		
a foundation degree for industry is supposed to be for people in employment when I arrived here in [redacted] there was an opportunity to bid for an HEFCE strategic development fund of [redacted] million to set up a foundation degree centre our head of [redacted] joined me to set that up and we developed bespoke foundation degree courses for [redacted] and a logistics and foundation degree course [redacted]	UB1	Foundation degrees		
so [redacted] would take be the sole sponsor and take the lead on it and be in control-work with FE colleges-work with [redacted] Council who gave the land-work with [redacted]	UB1	UTC	Collaboration	
Which are the most important quangos-that is a really good question-is it the quangos or the	UB1		Collaboration	Agencies

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
people you meet there-because the same people keep popping up-so I would meet the national training managers of companies like [redacted] and the CEOs of probably five or six-so they are employers				
So I'm therefore identifying opportunities I probably should be therefore lobbying I like money I like to know where the money is coming from example catapult I want to know what's going on so I can be part of it	UB1		Collaboration	Agencies
Does that include knowledge transfer between universities and the sharing of best practice in learning and teaching the higher education Academy are the institution for that-formally the subject centres would have coordinated that	UB1		Collaboration	Agencies
I'm a member of the utilities sector skills board which includes [redacted]-we have pots of money coming through there for various things which might be used by the engineering team	UB1		Collaboration	Employers
I work with the sector skills councils-I'm a board member of [redacted] and we helped to deliver apprenticeships	UB1		Collaboration	Employers
So you sit on these different agencies with employers-so on the utilities skills board we've got [redacted] these are important depending upon the projects we've got and our direction at any time	UB1		Collaboration	Employers
we work really closely with [redacted]-we have just done the foundation degree centre and there has been further engagement with the Academy and our student placements and knowledge transfer partnerships-it seemed a good place to go to do business and understand them more but if it didn't work I would come off	UB1		Collaboration	Employers
The employer that we do most business with is [redacted]-their CEO is our chair of governors They worked with our Academy-we get 25 or 30 students on undergraduate programmes a year and five or 10 on Masters	UB1		Collaboration	Employers
It is a University technical College every single module in the delivery of the curriculum at that school has got employer involvement in learner outcomes and assessment and employer support including schedules of company visits	UB1	UTC	Collaboration	Employers
Externally, we consulted with [redacted] so quite a narrow consultation	UB1	Foundation degrees	Collaboration	Employers
The vice chancellor is on the BIS board and I think that is very important for [redacted]	UB1		Collaboration	Govt

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
In your brochure that says diversity drives innovation-how do you harness the diversity of all the universities in the UK The government has done quite a lot towards that-bids now have to be in partnerships-and apart from catapult they will no longer pay for capital equipment-so the big push from government is come on you lot share and collaborate	UB1		Collaboration	Govt
We have the director of the regional development agency on the governing body of our Academy under the catapult initiative we bid with the regional development agency and [redacted] Council on the future city's strand and with [redacted] and LEPs and [redacted] Council on the advanced manufacturing strand	UB1		Collaboration	Partners
We have a few deep relationships with FE colleges We validate programmes with them	UB1		Collaboration	Partners
we have a very strong schools and colleges liaison outfit	UB1		Collaboration	Partners
25% of our students mentor in schools in the region-we have 76 secondary schools last year we put out 2500 students helping with maths and English and languages-it was about 50 when I joined-it is really good for our regional links and for student skills-this is done by our learning enhancement team	UB1		Collaboration	Partners
We recognise a social role in raising aspirations-but it is also because we get 50% of our learners from the region It's about raising aspirations and about clarity of progression routes-it is an overhead	UB1		Collaboration	Partners
Our competitors in this area our benchmark places would be [redacted]	UB1		Collaboration	Peers
We are associated with local universities-there is the [redacted] There are joint initiatives and partnerships are increasingly important so we put together bids around aim higher and graduate advantage both of which [redacted] led Now the RDA has gone, our head of employability works through it to encourage students to stay in the region	UB1		Collaboration	Peers
Do you feel competitive- we are angry with [redacted] because they have just opened a pharmacy school when this is very much what [redacted] does-and they've poached our staff	UB1		Collaboration	Peers
We have a variety of partnerships with different universities concerning research things	UB1		Collaboration	Peers
We are not a groupie in terms of University Association	UB1		Collaboration	Peers
there have been increasing opportunities to bid in the learning and teaching space-I mean teaching cannot be competitive can it- so the community	UB1		Collaboration	Peers

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
of practice has always shared-the research areas tend to be a bit more				
I shared the schools commission on high level skills-I'm quite well networked	UB1		Collaboration	Prof nets
I'm on the children's University that's very much about aligning schools and raising aspirations	UB1		Collaboration	Prof nets
I have a huge personal professional networks I might ring exam boards or exam bodies particularly concerning the Academy-people at city and Guilds OCR AQA	UB1		Collaboration	Prof nets
Regarding the consultation for [redacted] small businesses- [redacted] sent an email to [redacted] saying what you think she sent an email to the Dean of the business school saying who have you got and he identified the academic team we ask the people who are relevant to delivery but not more widely for approval	UB1	SME Prog	Internal collaboration	
Internal consultation for the foundation degree a bid was put together with the Dean of engineering, the [redacted] programme director and our knowledge transfer partnership team-it was signed off by the Vice Chancellor and the finance director-so I would say that consultation is always with the relevant people At all levels so of course it included the academics who were going to deliver it	UB1	Foundation degrees	Internal collaboration	
Did you tailor these three innovations-in as much as there were already existing models-to what extent did you tailor these models to fit [redacted] I did tailor the Academy, and that's because of the curriculum and the contacts that I have-is the one that I have been most deeply involved with	UB1	UTC	Journey	Design
We open the Academy [redacted] with an intake of 150 and when it's full there will be 600 it is a small bespoke institution with a high staff student ratio selection is open and random, but we ensure that students are spread around the schools in the area	UB1	UTC	Journey	Design
Did you tailor these three innovations-in as much as there were already existing models-to what extent did you tailor these models to fit [redacted] but I didn't modify the [redacted] the people who took on the foundation degree and the [redacted] opportunities absolutely did tailor them and they are flexible to employers all the time [redacted] expects all the versions to be similar-there are slight differences-and the scheme does involve overtime	UB1	SME Prog	Journey	Design
It started as a soft start-[redacted] were concerned about their reputation so there has been a lot of careful control how we have launched it-but now we are in the third iteration they are relaxing	UB1	SME Prog	Journey	Design

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
To get on it your employer has to say you're in the appropriate job and you start with a foundation degree and can then progress to the BEng It's all University assessed but employers do sit on our programme board and the courses were collectively designed and developed initially we taught each group from each employer separately but now we can teach them together And there are lots of benefits for students to do that the workplace parts are specific to the employer and so there is a dialogue outside of our placements and our MBA-it was our first step into co-development of the curriculum About 50% have gone on to do top ups to a full degree because the skills gap in engineering is very much at level 4/5-employers want them to go on to get the full degree or Masters where 50% is work-based	UB1	Foundation degrees	Journey	Design
We do have bespoke Masters in professional engineering and that's all accredited prior learning of work-based experience-captured in a reflective log and portfolio	UB1	Foundation degrees	Journey	Design
Did you tailor these three innovations-in as much as there were already existing models-to what extent did you tailor these models to fit [redacted] I didn't modify the foundation degree but the people who took on the foundation degree and the [redacted] opportunities absolutely did tailor them and they are flexible to employers all the time	UB1	Foundation degrees	Journey	Design
The Academy will be a state funded independent school where we control the governing body so the systems will not link in any way with the universities	UB1	SME Prog	Journey	Org fit
The measure of success for these initiatives is embedding really	UB1		Journey	Reflection
Did you look back and see whether the initiative has turned out as expected in the business case For the Academy success is how many students and how many companies we the governors ensure reflection and there are KPI's	UB1	UTC	Journey	Reflection
The [redacted] small businesses started in [redacted] and it is still early days	UB1	SME Prog	Journey	Reflection
We see [redacted] all the time The team sit down after every programme and review that programme and look at the next programme-and look to see who they need to involve	UB1	SME Prog	Journey	Reflection
Did you look back and see whether the initiative has turned out as expected in the business case For [redacted] small businesses, success is 100% completion with no dropouts-there is stringent constant feedback from each participate for each	UB1	SME Prog	Journey	Reflection

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
module and this is reflected upon an action is taken-there are also peer reviews There have been fantastic differences within the businesses-this is from feedback by them and by the way they sell services to each other-				
Do we have a formal mechanism for reflection-that's a really good question the foundation degree programmes come under our annual quality assurance monitoring-so there is engagement by the key staff on progress and embedding-but we haven't sat down and considered the final report to HEFCE-it is now embedded in engineering	UB1	Foundation degrees	Journey	Reflection
Did you look back and see whether the initiative has turned out as expected in the business case We have done that with the foundation degree centre absolutely	UB1	Foundation degrees	Journey	Reflection
Or some people might be pressured by the government to start a UTC Maybe pressure is put on people to say yes and this pressure is not recognised but as an institution I think we know what we do and what we don't do we are quite small and have specific subject areas we don't chase what doesn't align because we haven't the capacity to do that	UB1		T&J	
Regarding justification and internal bids, we have a strategic development fund that the VC runs you have to make a business case ideally on one page The purpose is identified, the benefits and costs quantified	UB1		T&J	Business case
It did require resources but it has all been fully funded by [redacted] under their corporate social responsibility-it has been a most pleasurable arrangement	UB1	SME Prog	T&J	Business case
We do learn from situations in other places	UB1		T&J	Copy comp
Coming back to do we mimic people, I'm not sure-the Vice Chancellor has a clear vision of what we do and what we don't and she's very good at backing things We certainly wouldn't mimic them without thinking through I am not sure that we would mimic market leaders-we must-but I cannot think of an instance	UB1		T&J	Copy comp
[redacted] small businesses trigger that was opportunistic-a professional colleague was running the second cohort at [redacted] met-[redacted] were looking for a [redacted] partner-my colleague phoned me up to see this is just in your space-I when up to look at the programmes-I contacted our business school and he was excited and agreed to lead it-we assembled a team and bid for the programme-and now it's successfully rolled out	UB1	SME Prog	T&J	Copy comp
We were a pioneer with the [redacted] Academy	UB1		T&J	Feasibility

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
I think these decisions are research informed of the benefits				
How did we test in advance that it would be successful regarding the UTC, there were one or two set up already	UB1	UTC	T&J	Feasibility
How did we test in advance that it would be successful regarding [redacted] small businesses, [redacted] [redacted] were already doing it	UB1	SME Prog	T&J	Feasibility
How did we test in advance that it would be successful regarding the foundation degrees, Eon and Scottish and southern had already approached us before we bid	UB1	Foundation degrees	T&J	Feasibility
The trigger for the foundation degree HEFCE's strategic development fund for employer engagement the Leitch report it was a completely new direction for [redacted] and I don't think we would have been able to initiate it without the money-this enabled us to appoint a director and staff to develop these bespoke curriculum now three years on we have embedded it back into engineering For both [redacted] there is perfect alignment regarding employment engagement between the direction of the universities and the policy of the government	UB1	UTC	T&J	Govt
Trigger for the engineering Academy Sir Ron Dearing wrote the 97 White Paper-he and Kenneth Baker visited the University in [redacted] and spoke to the Vice Chancellor and myself the concept was to blend this academic/vocational divide in the technical disciplines that the UK suffers from-if universities would lead-it's about bridges and ladders-to be successful in technical subjects you need to be good at maths physics and chemistry-but also higher apprenticeships are important-it's about levels of learning competencies	UB1	UTC	T&J	Govt
Would these innovations have happened without you The foundation degree centre I would have hoped so but I'm not sure the [redacted] Academy absolutely not The [redacted] small businesses was so opportunistic it was serendipity it was senior leadership being networked I am no longer anywhere near it-that is the business school	UB1		T&J	Leadership
to what extent were the leadership team of the Vice Chancellor and the other pro vice chancellors.... looking at your plethora of innovative initiatives...	UB1		T&J	Leadership

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
Is innovation culturally infused within Aston or are you a pocket of it Like many pre-1992 universities, we are very decentralised and we have a tremendous amount of innovation in all pockets				
When the vice principal came here in [redacted], it was a pivotal moment-prior to that senior management were quite oppressed-the vice principal that you get on with things, she brought in the research institutes, one of the things I'm looking at is creating a University out in [redacted] the Vice Chancellor has been pivotal in freeing up people who want to breathe-but if some don't, it probably just gets left-each of us led teams and encourage them to do that	UB1		T&J	Leadership
Is innovation infused within your area-I have had some really good people in my team and each of them has driven their areas	UB1		T&J	Leadership
Legitimacy-because other people expect you to do it-would not gain legs in this institution	UB1		T&J	Rep/leg
I don't think we would go ahead, even if there is a clear advantage in terms of reputation, without a business case-I know I couldn't get it through without the costs balancing And often in real life, reputation has a close connection with enrolments	UB1		T&J	Rep/leg
Individually, I do not recognise professional peer group pressure-I am incredibly self referenced-I have high expectations and aspirations-I am reflective-task focused and goal driven perfectionist	UB1		T&J	Rep/leg
Because we are small, our reputation is really really important the [redacted] Academy was a huge challenge-why are we creating a school-it carries our name- there will be a risk to our brand-if it ceases to become a high performing school what impact does that have on the University	UB1	UTC	T&J	Rep/leg
For example students might expect technology enhanced learning-yes	UB1		T&J	Stakeholders
Research is showing that with institutions like [redacted] students who follow their degree discipline in the workplace get a better classification of degree have more job satisfaction and get paid more	UB1	Employer engagement	T&J	Stakeholders
Strategic alignment-absolutely	UB1		T&J	Strat opp
there was a funding opportunity in the space where we wanted to work it was a completely new direction for [redacted] and I don't think we would have been able to initiate it without the money For both [redacted] there is perfect alignment regarding employment engagement between the direction of the universities and the policy of the government	UB1	UTC	T&J	Strat opp

Chunk of text	Institution/ Interviewee code	Innovation	Higher level code	Sub-code
International students There will be diverse models the bottom will fall out of the international market-a lot of institutions have international partnerships and campuses overseas-people are setting up teaching English-I think we are getting to the point where we are pricing ourselves out-there will always be a top that can afford it-but I think it will change and we will need to be really savvy 25% of our income comes from foreign students-that's why we are exploring creating a University innovation in partnership with a University out there-people will get hit in this space	UB1		Z conformity	International students
Research versus teaching and learning Again because we are so diverse-I think the student experience will become more important-students deserve outstanding teaching and researchers should be outstanding and passionate communicators about their subject	UB1		Z conformity	R v T&L
Widening participation and the way it is interpreted by universities the sector is too diverse for a common model-everyone will answer that question differently and behave differently now there is very little funding for it you will see universities where it is not central to their mission doing less of it	UB1		Z conformity	Widening participation

Exhibit 2 Original un-edited interview transcript

Are you happy about discussing a few innovations that are illustrative absolutely idea to run through looking at your timeframes about the learning and teaching and employer engagement that we had done and so I thought that if I highlighted those I don't want to select them for you I want you to choose the things that you are most proud of okay you have a plethora of activities I've looked through your [redacted] all these things that's the thing it's trying to make the most use of this interview I know you're seeing [redacted] and he will talk to you about VLE and [redacted] know nothing about technology enhanced learning what if you go back about seven years [redacted] always had a placement year but in terms of the development of bespoke programmes with employers or foundation degrees we just didn't do them we were a very traditional university but you've always had a focus on employability we've always had the placement year but of course research now shows that where institutions like your own institution at Surrey [redacted] when you have that research is now picking up that in general it's will be for students a better classification research shows an increase in more of about six or 7% more job satisfaction the fact that they follow their degree discipline in the workplace and they get paid more it's not anecdotal any more so we've always worked in that space which has major advantages for undergraduates what we haven't done is foundation degrees which a lot of universities have done and very much a foundation degree for industry is supposed to be for people in employment and I say we are supposed to be because a lot

of them are the third A-level route through but [redacted] never did any of that but I arrived here in [redacted] and there was an opportunity to bid to the HEFCE strategic development fund and we got [redacted] to set up a foundation degree centre and effectively that was something that [redacted] who are not seeing is now [redacted] [redacted] but effectively he joined me to set that up and implement it and over that in error we developed bespoke foundation degree courses for [redacted] [redacted] that is still continuing I was just going to say it is rolling from that I think that was kind of strategic and then bespoke modules that you're developing for their needs absolutely complete bespoke programmes at any includes the course workplace learning accredited prior learning and that sort of thing no in the programmes you have to have at least an HND I'm sorry that's for the progression to the BEng to come on it you actually need you need almost no prior qualifications you need your employer to say that you are in that appropriate job so you still have to go fully through all the modules yes was there any employer assessment of these modules it is all University staff but they actually sit on our programme board and our exam boards and collectively designed and developed the modules for validation what is quite interesting looking back that initially we had to teach all these groups separately even though it was the same qualification but we've now grown up and we can teach them together from different organisations yes I mean there are a lot of benefits for students to do that but it's the sensitivity of when to sit the workplace parts are individual because it's the application of the knowledge in the workplace so in some respects that approach that engagement with employers is a proper dialogue outside of placements and our MBA and other things it was the first what I would call step into co- development of the curriculum and I think that is something that is innovative about the approach so the second one that I would highlight so that's your foundation degree centre do they go on to top ups well what we found we thought it would be I don't know 25% would want to go on perhaps less than 25% we've actually had approaching 50% because the skills gap in engineering is very much at level 4/5 employers want them to go onto the degree programme and masters perhaps and masters our professional do any bespoke masters absolutely we do two a masters in professional engineering and that's all accredited prior learning and work-based experience effectively takes you up the route of capturing all of that in a reflective log and a portfolio so that's our masters in professional engineering but for our foundation we then got the progression onto B Eng where 50% is work-based it's a major project that solves the problems you are having its classic staff and you've also got all these other things graduate advantage knowledge transfer partnership case 10,000 small businesses just by looking through your material and you've probably got lots more there's a huge number of initiatives in a way I'll leave the centralising placement office and placements for years I think the other one that you've just caught there that I was going to talk about is our [redacted] SME creative [redacted] small businesses I don't know whether you picked that up I didn't know it was [redacted] you're not the only institution that does that are you [redacted] are the three at the moment and it's just started in [redacted] and effectively what it is it in your locality it is offering a programme to entrepreneurs that are at the cusp of tremendous growth so to get on the programme which is fully funded by [redacted] you've to be in between what I would call the incubator initiation how many employees would they typically have at this stage it depends it goes from about 6 to about 80 on the cohorts that we've had actually it's about turnover as well and they have the three benchmarks if they're 80 they are a fair size already exactly and of course now what we've got having got this bespoke programme for [redacted] we can then use these regional

entrepreneurs to mentor our own students our students in the Academy and they are within these cohorts doing business with each other and the University so that is a real innovative program the spin-offs round by joining it up almost through learning and teaching and they're mostly engineering no no not at all HR marketing across the piece and it can be a small IT company it could be an HR services company it could be anything you're set for accelerated growth and fully funded by [redacted] but I said I think it is the spin-offs from that that are really interesting I'd like to now go through the journey the process can I mention another one which is the creation of the [redacted] Academy which is a school which the University has led for 14 to 19-year-olds so that's not a university technical College yes and the reason for mentioning it is because because of our deep and meaningful engagement with our employers every single module in the delivery of the curriculum at that school has got employer support down to individual partnership learning and plans saying who is coming from the company on that day when the students are visiting what the learning outcomes are and how it is to be assessed we so we've got the foundation degree centre the [redacted] small businesses and the Academy I'll leave the PG cert the IT stuff I'll park those yes we can't do everything in this short time so I think that those are the three I'll try and discusse them generically if I can then we can say that was like this that this is different okay if we take the first question about the journey what triggered the setting up of these the idea to go forward with them I guess the thing that triggered it was the strategic development fund at HEFCE for employer engagement and the Leitch Report and so on well for the University positioning if you said there was a funding opportunity in the space we work in to develop a position in the direction would like to go I think the whole things come together but without money I don't think we would have been able to initiate it because it was a completely new direction for [redacted] as a university whereas with the money we were able to appoint [redacted] as the director actually buy our staff into it to develop these bespoke curriculum then three years on we've embedded it back in engineering so it's a case where your strategic direction with the government's policy direction when I think this [redacted] sit there as does Surrey sit there at the moment there is perfect alignment there are employment engagement base is just perfect for it what about the [redacted] the SME one there what's that when it's opportunistic if that's the word I have a colleague who was running the professor of entrepreneurship at [redacted] who were the second cohort of [redacted] who were running the program so they were already running the program yes it started in [redacted] then they did [redacted] were looking for a [redacted] partner and I say opportunistic because it is purely that I've worked with the professor who rang me up and said hey this is just in your space as in employer engagement building small businesses what do you think so I went up to the Leeds programme went up to the [redacted] programme and I said yes I think we are in contacted our Business School [redacted] is a professor in SMEs and small businesses he was excited by it he agreed to lead it the Business School were delighted people around the table we bid for the money developed the program with [redacted] advertised it and rolled it out and it's now happily going along but presumably it required your resources as well to be fair to [redacted] they fully funded I have to say it's been the most pleasurable arrangement I'm not saying not challenging but the bid went to their trust because it's under their corporate social responsibility if you can give me an idea of scale how many students are involved between 20 and 25 on each iteration we've had three iterations and the plan is to do either two or three every year for a five-year period so that 70 odd a year and how long would each iteration last it's about three months they have 12 sessions they got business mentors there are six

modules on HR marketing planning business development all those things you need in a small business that you don't always have and the engineering Academy how was that triggered Sir Ron Dearing who I'm sure it's a name you've yes and I'm not an educationist sometimes you wonder if it's an age thing he wrote the 97 White Paper and Kenneth Baker visited the University in [redacted] and they had a chat [redacted] Ron Dearing's concept to finally blend this academic vocational divide in the technical disciplines that we suffer from had come up with the idea that actually if universities would lead these it's possible to see that it's pressure to universities is a possibility universities are saying there are bridges and ladders to be successful in technical subjects you need to be good at maths physics and chemistry but also apprenticeships higher apprenticeships are important they are not different it's about levels of learning competencies capability at what they wanted is effectively to say [redacted] we'll lead it so we did in conjunction with local FE colleges know we kept completely sole control of it and that sounds terribly egocentric but actually too many projects if you don't know who's in charge decision-making turns we will very much working with [redacted] who gave the land and were fantastically supportive they gave the land just behind our science Park tremendous support from [redacted] again we're going through all our employers who came to the table everybody supported it but we are the sole sponsor just going off a tangent would you say you were a civic university I think that you would have to define the name for me first No I don't want to do that I think what you mean by that I'll be constraining the way you would answer it what do I think you mean by it I think we've got very strong values and ethics and that we believe as well as being an international and national university we also fully engage with our community 47% of our undergraduate population come from the [redacted] and you collaborate with local agencies absolutely for economic regional regeneration we do through our knowledge transfer but on the strength of what we do between learning and teaching and employers is our engagement with the curriculum for bringing it employers in to contribute and that's what we do across all our programmes and clearly we want our graduates from [redacted] to remain in [redacted] so if we are doing placements in [redacted] they've got projects in [redacted] and particularly for some of our [redacted] women wear the families don't like them going out of [redacted] for placements so for them to get a graduate status job it helps for them to be really well networked in for all these activities I want to go on now to how the decision making is made you drove these three initiatives did you yes it sounds to me that you were there at the start would they have not happened if you weren't there might have done might not have done the foundation degree centre I would have hoped so but I'm not sure the [redacted] engineering Academy absolutely not and the [redacted] no but that was so opportunistic and it's not me that is anywhere near it it is the Business School and so it was serendipity that was the word I was looking for or you could say that was senior leadership being networked yes it was the juxtaposition of two disparate things and being related and associated yes so that's what innovation offers well it might it might not have done it sounds egocentric no I drank offered a slight tangent to what extent were the other leadership team [redacted] and other prior vice chancellors looking at the plethora of initiatives there is an innovation culturally infused within [redacted] or maybe you are a pocket of it I think we are a very decentralised organisation as a lot of [redacted] are and I think we have a tremendous amount of innovation in all pockets you wouldn't say it was culturally infused it could bypass some parts culturally infused it's rather like institutional racism I think when [redacted] came here in [redacted] I think it was a

pivotal moment for [redacted] I think they had had a VC for a long time and I think they were quite oppressed you mean senior management well just strained the thing about [redacted] is why I like working for [redacted] she lets you go with things and she's also brought in the research institutes one of the new projects I'm doing I'm looking at creating a university out in [redacted] research co I'm taking off the atomics team I'm taking off lead profs but they are freed up to do that I suppose that is innovation I believe the [redacted] she has been absolutely pivotal in that freeing up those people who want to do it able to breathe but if some don't no it probably just gets left possibly with trying to cross institution and [redacted] development and each of us led teams and encourage them to do that have your selected a team that has the same mind and is it infused within your area now I haven't a team I ceased to be the learning and teaching pro VC come strategic academic developments because I've got some major projects that I'm looking at but previously I would have said that [redacted] are the members of my team one is the head of [redacted] which is key across the piece and [redacted] is very much curriculum and learning PG cert and teaching strategy they both drive but also [redacted] team and employability [redacted] head of employability really good ex graduate advantage her team around careers and engagement very good so we have some really good people consultation when you did the things how did you consult did you consult senior managers in [redacted] lecturers within [redacted] outside bodies did you consult foundation degree the bid was put together with engineering and with our knowledge transfer team and within Dean and so on yes anyone the power engineering programme director so of the disciplines we were proposing their team the money came in they knew what was happening knowledge transfer partnership team put the bid together and interestingly at the time [redacted] worked there as a materials engineer and clearly signed off by [redacted] and the finance director since it would have to go so I would say that consultation is always with the relevant people but at senior level both but people who are going to deliver what about externally you've mentioned employers several times well we have the employers with it so [redacted] and the [redacted] and so on not for the foundation degree [redacted] so quite small consultations not a wide consultation such as is this a place [redacted] should go the people who are going to deliver it they were consulted they were in the bid because if you don't get your academics how did you test in advance that it would be successful because the people were in dialogue before we bid so [redacted] had approached us about these and [redacted] had and [redacted] were already doing it and UTC there were one or two set up already consultation for [redacted] wasn't sent an email to [redacted] saying what you think emails to the Dean of the business School who have you got he identifies the team and the next question is who is that academic team we ask the people who are relevant to it and who will need to deliver but not more widely for approval in terms of justification you mention having bids and so on these are external bids but there are also internal bids if you need resources we have a strategic development fund that the VC runs and you have to make a business case and this includes not only the benefits do you have to quantify the benefits purpose outcomes benefits costs I mean short but you still have to have headings for all these things yes and ideally only one page so there is quantifiable cost benefit analysis of some sort strategic alignment absolutely what about legitimacy it's because other people expect you to do it with that ever be a case if you were doing an initiative to be fair I don't think they'd gain legs in the institution for example their students might expect it to example they may go down the route of technology enhanced learning yes sometimes for some people might go down the route of UTC because their arms are twisted by the

government I think we are a bit clearer in cases that we do that we don't realise that happens you do put that pressure for people to say yes and you don't pick up the no on and that's because of behaviours but as an institution I think we kind of know what we do and what we don't do and to because we are quite small and we have specific subject areas and areas that we don't do we don't tend to go chasing what doesn't align because we haven't the capacity and you cannot staff up quickly if you go in chasing we do sometimes don't get me wrong but we don't deliberately do it so would you say you are a pioneer in lots of these things I think with [redacted] engineering Academy we certainly are and I think all these decisions are research informed of the benefits they are not kind of? Is vicarious learning coming into it where you learn from the situation in other places yes and the sector I shared the schools commission on high level skills I'm quite well networked in on what's what do you mimic what competitors might be doing who do you regard as your competitors competitors in this area our benchmark places would be [redacted] I think [redacted] might be one of them the reason I picked [redacted] was because you have a reputation for employer engagement employability for widening participation and for value added absolutely so coming back to do we mimic people I'm not sure really I think that we're a bit more under Julie has a very clear vision she knows what we do and what we don't she's very good at backing things but you wouldn't mimic them without thinking through it Oh God no I'm not sure we would mimic you might mimic market leaders or as a defensive mechanism I'm not sure we may we must you can't have institutions that don't even if it's just what you're picking up you cannot think of an instance no when I mention legitimacy this is closely associated with reputation how does that come into your decision-making because we are small our reputation is really really important and it was a huge challenge around the [redacted] engineering Academy Why is a university creating a school what is the relationship it carries our name what is the risk to our brand it's not a financial risk but a brand risk if it ceases to be a high performing school what impact does that have on the University that's a negative thing what about a positive thing to example I'm going ahead with this even though the business case may be unclear but there is a clear advantage in terms of reputation I don't think we would do that without a business case and I know I couldn't get it through without the costs balancing of course in real life reputation often has a close connection with enrolments and that sort of thing and effectively we've got 60% of the governing body and the directors of the trust are [redacted] what about professional peer group pressure do recognise that at all individually or as an institution individually I am incredibly self referenced so I no I don't think I do I have high expectations and aspirations I think I'm reflective I would be described as task focused goal driven perfectionist which kind of makes me sound OCD I don't think we need to say that these three innovations you could say there are models of how they should be set up to what extent did you tailor those models to fit [redacted] if I distinguish between I and the team I didn't modify the foundation degree I didn't modify the [redacted] the one I've really tailored is the Academy and that's because of the maths physics chemistry and engineering and I have the contacts and that is the one that I have really been deeply involved with the other two less so but have the people who have taken them on have they tailored them absolutely and they are flexible to the employers all the time I'm a member of the utilities sector skills board which is the [redacted] sector skills Council so we've got pots of money coming through there for various things which I might have yes we've got that pot but then [redacted] and the team in engineering so the way that you have done this [redacted] might be different than the way Leeds have done it they are all slightly different and [redacted] who is the professor who is leading that has

very much controlled but the core is the same [redacted] do like it similarly but they do evolve and that is a working relationship that has evolved with time but in a way except for turning up at graduation I've really no more involvement personally I think it's a really good example of employer engagement which is why it's one of the ones that I'm sharing with you did they start off as a big bang all were there pilots soft start [redacted] were also concerned about their reputation and image so there has been a lot of careful control of how we've launched it how we've done it and they are relaxing now as we are into the third iteration so the Academy you would start with a small intake we've 150 as we open this September 60 14-year-olds 100 16-year-olds and 15 apprentices it's quite a small institution there are only 600 when it's full of the University technical colleges because they've only got the four years of 14 to 19 and the high staff student ratios they are small bespoke institutions of about 600 learners had you take in the students through the local authority at 14 is there a competition parental choice open random selection you can do it laddered when you take 10% A's and above we didn't go for that what we want is people who want to do science and engineering so in our first year it is completely open but to stop us taking high numbers from any one school we've got six nodal points transport arrangements and having just opened the most we've got from any school is about two now how has the thing been bedded down is the innovation seamlessly embedded within the routine what I mean by that are all the different systems quality systems human resource system financial systems they're all applied to these three initiatives Academy not quite yet simply because or will they it's only just opened the governing body and the subgroups are getting organised it's still in the early stages but it will just be a state funded independent school where we control the governing body it's our school it is a separate company limited by guarantee it's not linked financially to the University but it's controlled by University personnel yes it's in the articles we've modified the articles slightly to have an extra parent governor 25 parents wanted to join the governing body which is just unheard of in a state school absolutely fantastic so we altered the articles to just have one person from the LEA and two parent governors what about reflection or post-implementation review to see how they are doing can we improve them and so on to have a formal mechanism I think that's a really good question no we don't have a formal mechanism the foundation degree programmes come under our annual monitoring which is a form of QA so there is engagement by the key staff on progress and embedding but I except for contributing to the final report to HEFCE on a reflective account of it haven't subsequently sat down with the course team that it is now embedded in engineering as part of their operation the [redacted] is still early days started in September 2011 is it in the agreement with [redacted] we have a five-year arrangement with them but you have an annual meeting or some they see us all the time yes but you see each other on operational things but we'll step aside every year we'll have a formal meeting how is our partnership going are we meeting our original objectives the team sit down after every programme review that programme look at the next programme look at who they need to involve because recently they brought on one of their directors from [redacted] who is also very keen to take it further to take into the regions and engage with entrepreneurs in schools it is quite a tight cycle of constant I suppose [redacted] allocate different people from time to time to look after this initiative it might be a development programme for their people to look after this possibly the stable personnel have been the regional director the National Director but it's the first time we've met the person from [redacted] because I think that the National and regional people think that we are at a state of calmness that [redacted] can come in and look at us I don't know and the Academy is just ongoing do have measures

of success for these initiatives success is embedding really when you set up a business case what does success look like and do you look back a year or two later and say that's what we thought success should be have we met it or did we have the wrong idea of success that exactly what we do with the [redacted] Centre but the centre no longer exists because we've embedded it into the schools but during the time of it but absolutely success how many people have we got how many companies in the Academy I'm pretty sure that you would do it because you have governors absolutely we have KPI's but for the [redacted] one I would think that [redacted] success is 100% completion no dropouts I mean they are really quite stringent constant feedback each module from the participants reviewed reflected on action taken and they peer review have you made a difference within the businesses ah fantastic how do you measure that feedback from them actual talk about what they've done what they started to do is effectively sell services to each other so we meet them twice at the start and at the end and in a way it's anecdotal more of what they've got out of it because some are a bit cynical about coming but the support around basics such as HR accessing extra venture capital funding you might think that if you run a small business you might know all these things but they don't what they know is what their innovation is is it competitive to get on the scheme now highly from a business point of view the businesses are students inasmuch as they are CEOs a bit now about your collaboration we've covered employers and councils and the city anything else which might have done once with the regional development agency we've got their director on the governing body of our academy to have any joint developments with developing one of the bids under the catapult initiative this is about 350 million Cameron's latest buzz word about innovation and it's to get the great ideas of research and innovation out in a developed company there are six or seven categories advanced manufacturing digital thingy cities and we are with the bit with [redacted] we are involved in the future city's bid and the advanced manufacturing that wouldn't come under my remit but [redacted] whose our is involved in those and really [redacted] have got have got that integrated into via the LEPS and [redacted] what about government agencies BIS DFE quangos sector skills I personally as a university have Julia is on the BIS board so you have a lot to do with the sector skills councils absolutely on the ball member I work with [redacted] they help deliver the apprenticeships and we help deliver the apprenticeships so this is over and above the foundation degrees oh yes this is kind of what we do and there again we are looking to create a university in partnership with so which are the most important quangos that's a really good question is it quangos or the people you meet there because it's interesting the same people keep popping up so I would know the National training managers of the report directly to the CEOs [redacted] and I know the CEOs of probably five or six so they're employers yes what about agencies yes that's what I'm coming back to so these are also agencies you sit on these different bodies with them so the EU skills board sector skills we've got water [redacted] we've got [redacted] they all sit there I'm not answering this one well which are the important ones and why I am sure the BIS board is really important for [redacted] I think they are important depending upon the projects you've got and the direction you are going in at the time and what do I mean by that I said yes to go in on the sector skills board because we work really closely [redacted] we had just done the foundation degree centre and wanted even further engagement with the Academy and our student placements and KTP's it seemed a good place to go to do business and understand them more if that didn't work I kind of come off so you're there for identifying opportunities I think I am you are not there to lobby I probably should be

their lobbying you are not there for money I quite like money I like to know where the money is coming from catalyst catapult you want to know what's going on yes so if there is anything interesting you'd want to be part of it I think that's what you are doing there let me just run through I'm on the children's University that's very much about aligning schools raising aspirations [redacted] I read somewhere that you are represented on 120 institutions we are I am sure [redacted] will sit on loads of things was about FE colleges and your relationship a few deep we tend to have deep relationships so you accredit their courses we validate programmes so that's the only reason schools very close coming back to FE we validate programmes with them and a co-deliver call up for funding and QA them we've got a very strong schools and colleges liaison outfit we try to work with as many as possible 25 % of our students mentor in schools in the region and we have 76 secondary schools last year we put out 2500 students helping with maths helping with English helping with languages not your own that's another thing that we have grown it was about 50 when I arrived it is really fantastic for student skills professional body recognise it and great for our links regionally that's really grown and you do this personally no our learning enhancement team in fact it comes under [redacted] schools and colleges liaison is a separate one and they again do a tremendous amount with our local schools what do you get out of that why you do it I think we recognise a social role in raising aspirations saying that it cannot be completely altruistic because 47% of our learners come from the region so I think it's a combination so it's part of your (civic) widening participation remit rather than say Oxford University might say to the brightest students we'll give them a bursary and you say getting there early and we'll give them aspirations yes it is about aspirations and it's about clarity of progression routes it's an overhead to do that our schools and colleges liaison is also linked with recruitment so that team you're obviously in association with other universities is there anything particular local universities the key ones in the region we are all affiliated to [redacted] higher education Association and that's [redacted] and what benefit you get out that where there are joint initiatives and partnerships are increasingly important so we put together around aim higher which [redacted] led we bid around graduate advantage which [redacted] led so that's a regional thing it was a regional thing but now that the RDA has gone the funding has gone but [redacted] who is the head of that's head of our employability and we have brought her in but that was very much region so it's for all students to encourage them to stay in the region so it is a collective thing they are quite different institutions you don't in any sense feel competitive we were very angry with [redacted] because they decided to open a pharmacy school just last year and that's always what very much [redacted] do School of pharmacy optometry is outstanding you just don't do it I am really disappointed in [redacted] coming in and of course trying to poach our staff really poor behaviours it sounds a bit precious but pathetic he's got enough problems without creating a School of pharmacy so we can get a bit edgy but in general what about nationally with other universities yes I mean we've got one partnership with [redacted] yes I think we are very open we've got a variety on different research things I don't know which of the various groupings you are members of we are not a groupie we are [redacted] in terms of professional networks all our courses are professional you personally have got a huge network I probably have yes I mean I have is that typical (hesitates) if we have a particular problem or interest do you pick up the phone and talk to people I would yes I might email actually asynchronous pickup is quicker ring them are exam boards or

exam bodies particularly around the Academy ring people at City and Guilds OCR AQA which is the largest employer will rather the employer that you have the most business with I think it will be [redacted] and it is interesting because their CEO is our chair of governors in terms of scale how many students would that cover or apprenticeships if we start in the Academy they're doing the energy journey PV on our roof we've got and energy package with them for [redacted] as a University that's also true in terms of undergraduate programmes we get 25 to 30 from them a year we've got some Masters students I would have to check the numbers five or 10 so it is less than 100 absolutely I have a quote from four 2000 recognising that diversity drives innovation just wondering how you harness the diversity of all the universities in the UK I think the government have done quite a lot towards that they are no longer putting out what I would call solo institution bids so you have to be in partnership also except for the catapult ones they will no longer pay for capital equipment so if you look at what the universities UK plc have is phenomenal often people don't share so the big push from government is come on you lot share collaboration collaboration so I think collaboration partnership are one of the few ways you will lever money out of government that doesn't necessarily include knowledge transfer between universities best practice and so on learning and teaching best practice probably the higher education Academy are the institution fully has the subject centres would collect it but there have been increasing opportunities to bid in the learning and teaching space collaborative I mean teaching cannot be competitive can It there are so many jobs the most outstanding teachers for the best students so free community of practice that has always been shared I think it's the research areas that tend to be a bit more I'm going to finish if I may on three question about conformity to want a definition of innovation we think it's new but it's not it's about taking what exists and making it useful for you it's not about standing there and having the Eureka moment it's probably new to you absolutely repackaged and new to you in your organisation I am going to pick three issues and I am wondering if the sector in the UK is converging on a single model of the way University's behave the first area is widening participation the way universities interpret what that means or will there be a spectrum I think the sector is too diverse for a common model and I think because of that everyone will answer that question differently and will behave differently now there is very little funding for it you will now see universities where it is not central to their mission vision and what they are doing less of it so that's a bit negative the second issue is the research versus teaching and learning some universities are very much into research some have research led teaching some are in teaching learning and not much research and so on again do you think there will be a plurality of models I think there's got to be again because we are all so diverse I think the student experience will become more important and I think the quality of actually teaching students deserve outstanding teaching and teachers and actually researchers should be outstanding communicators because they are effectively punting for their students of the future so do you think that lecturers think of themselves as first and foremost experts in their subject or communicators I think it's experts in their subject I think they should have such a passion for the subject that they want to communicate it but that's a personal view and the third area is foreign student income in terms of models I think there will be diverse ones the bottom will fall out of the international market I think it's gone you'll have to be talking to partnerships a lot of institutions American institutions Australian English have got campuses overseas people are setting up teaching English I think we are almost getting to the point where we are pricing ourselves out there will always be a top that cannot afford it but I think it will change we will need to be really savvy about what we do but a lot of your students

are foreign students 25% from overseas so that's quite a lot of income it is a lot of income so that's one of the reasons why were exploring curriculum creating a University in Asia in partnership with a University out there because people will get hit in that space the postgraduate taught I hope that was useful was there anything else that you have down I've got lots of things like the one VLE central placement officers third stream knowledge transfer whether you want to pick up on that BPU peer entry and PG cert it was really was the best thing for this conversation

APPENDIX I

DETAILED ANALYSIS OF ORGANISATIONAL LEARNING VERSUS INSTITUTIONAL CONFORMING CHARACTERISTICS IN RESPECT OF EACH OF THE 31 INNOVATIONS INCLUDED IN THE CASE STUDY

These analyses form the basis for the evaluation in Section 9.6 of the case study chapter. The 31 innovations are clustered into the 10 innovation types.

CREATE INSTITUTIONAL VISION

Civic Mission (UA)

The driving force was the context of a city that had lost its traditional industries some time ago. The vice-chancellor's vision was for the university to become one of the new breed of civic universities which play a pivotal role in the social and economic regeneration of the region. This clarified the university's role and direction and the resulting journey of over 20 years has culminated in a significant and unique story that can be told. There was not a business case for the umbrella vision. However, each component initiative that realised the vision did have a business case. There was no central government pressure although there were expectations from key local players, including employers, development agencies and the local council. Neither the OL or IC justification criteria strictly apply; both reputation and legitimacy apply; and there is considerable evidence of adaptability and consultative behaviour associated with OL. On balance, the whole raison d'etre of the mission change demonstrates OL behaviour.

Business Facing Mission (UC)

The driving force was pressure for universities to find a market segment – research or teaching & learning or some other segment. The visionary and charismatic vice-chancellor saw newly focussed business facing universities operating in the USA and could see how these accorded with the general awareness that universities need to take a lead on employability and enterprise, following the Leitch Report's concerns for the UK skills gap. With the help of substantial and vital government funds, the vice-chancellor set out an operational blueprint and drove implementation hard over several years. The senior management team were a strong and cohesive force. Clearly, there needed to be employer input, but implementation was very much a root and branch change to internal structures, processes and mind-sets. The result is a unique outcome. Again, altruistic responsibility and seeking an identity for long time survival as a

university were important drivers. The justification criteria and the significant level of adaptability/ consultation strongly indicate OL behaviour.

GAIN GOVERNMENT APPROVAL FOR A CHANGE IN MISSION

Foundation Degree Awarding Powers (FDAP) (FB)

FDAP was a government policy change inviting FE colleges to apply for awarding powers independent of ties with a validating university. The change would enable the FE college to offer a more responsive curriculum and reduce quality control overheads. There was no compulsion by the government to apply. The innovation was in line with the strategic objective of increasing the large HE presence in the FE college. There was a business case that included costs and benefits. Increased HE income was a significant driver. There were a few pioneering colleges and this college was an early follower. The enhanced mission would increase reputation. The implementation design and process is under the strict control of the QAA. However, considerable detailed adaptability and consultation in implementation was still required. On balance, this shows OL behaviour.

SET UP NEW INSTITUTIONS

UTC (UB)

The concept of a university leading 14-19 vocational education was very appealing to a visionary and charismatic pro vice-chancellor. It spoke of bridges and ladders as well as community engagement. It aligned with strategic direction, made financial sense and was demonstrably feasible. The design and implementation was tailored specifically to the ethos of the university and the curriculum needs of local employers. Local councils and FE colleges were also supportive. The university considered they were pioneering, although they were not the first to set up a UTC. Success would have enhanced their reputation: failure would have damaged their reputation. Legitimacy was not an issue. The design was tailored to specific local needs and the governance process ensured close monitoring and reflection. This innovation exemplifies OL behaviour.

11-19 Academy (FB)

Changes to the competitive and funding landscape, pressure from central and local government for an "outstanding" FE college to make a difference in the city and a visionary and charismatic leader combined to trigger this innovation. There were two business cases. The first was built around the strategic objective of tackling the 14-19 market, the feasibility of doing well in that market place and the damage to reputation of failure. The second was built around costs and benefits. There was no government compulsion and no overt need to imitate competitors. The design and implementation was very much based on existing values and curriculum expertise with considerable

internal and local consultation. The governance process ensured close monitoring and reflection. This innovation exemplifies OL behaviour.

SET UP NEW CENTRES

Clinical diagnostic centre (UB)

The vice-chancellor was keen to develop the university's niche areas of world class research. This new centre would build on the expertise and reputation of an existing facility. There was an academic business plan where the benefits would be research grants, maintaining the recruitment of top people and enhancing the student experience. There were significant capital funds from the government. However, there was no government compulsion, except indirectly through the pull of research funding. There was no direct competitor imitation, except that the concept of niche research centres is a common strategic approach. Legitimacy was not an issue. There is significant elements of OL behaviour. However, this innovation is an example of setting up a niche research centre which has become sector norm behaviour.

SME centres (UC)

The bio-centre for SMEs stemmed from the opportunistic action of a visionary and charismatic vice-chancellor following the release of facilities by a pharmaceutical company. The business case was based on the strategic objective to support SMEs, capital input from a development agency and a positive cost-benefit forecast. The business case for the SME information centre was also based on the strategic objective to support SMEs and a positive cost-benefit forecast. In both cases: there was no government compulsion, competitor imitation or obvious sector norm; reputation was enhanced and legitimacy was not an issue; and the service was designed and implemented by the university. This is OL behaviour.

Land based centre (FA)

The centre was acquired as part of a college merger. A business case was developed and the vision, drive and detailed design know-how of the faculty head turned a run-down facility into a thriving specialist land based curriculum centre with associated commercially successful business ventures. Governance included close monitoring of and reflection on performance. There was considerable support from the national association of land based colleges. There was no government compulsion and competitor imitation and sector norms were not factors. Both reputation and legitimacy were enhanced. This is OL behaviour.

HE centre (FB)

The FE college wished to consolidate and increase an already large HE presence into a dedicated centre with its own identity. The business case was based on this strategic objective to increase HE and a positive cost-benefit forecast. There was no government compulsion. There was no direct competitor imitation, although HE centres are rather common where FE colleges have a large HE element. Reputation and legitimacy would be enhanced. The design was based on senior management experience, working

within QAA regulations and support from validating partners. Governance included monitoring and reflection. There are significant elements of OL justification and behaviour. However, this innovation is an example of setting up an HE centre in FE and this is sector norm behaviour.

ESTABLISH VOCATIONAL PROGRAMMES

Bespoke programmes for a large employer (UA)

A very close relationship had been developed with a large international engineering company. This was based on the successful and repeat delivery of many bespoke engineering and management programmes that had been designed to meet specific problems over several years. Work with this employer was an example of enacting the university's civic mission. It also safeguarded a significant income stream. There is no government compulsion or competitor imitation. Reputation was important. This is OL behaviour. Although employer vocational programmes are now the sector norm, the driver was a genuine focus on market demand and not sector legitimacy.

Bespoke programmes for large employers (UB)

This was a focussed initiative to increase employer engagement, by providing repeat bespoke courses to several large local engineering / utility employers. The business case was based on alignment with the strategic objective of employer engagement, a government capital grant and a positive cost-benefit forecast. There was no government compulsion or competitor imitation. Reputation and legitimacy were both important. Modules were designed and implemented to meet specific employer needs. This is OL behaviour. Although employer vocational programmes are now the sector norm, the driver was a genuine focus on market demand and not sector legitimacy.

SME entrepreneurial programme (UB)

A visionary and charismatic pro vice-chancellor was networked and invited to bid for sponsored funds to deliver several iterations of a programme that had already been implemented by two other universities. The business case was based on SMEs being a strategic client segment and the courses being full cost recovery. There was no government compulsion, overt competitor imitation (although other universities were running the same courses) or relevant sector norm. Reputation and legitimacy were important. Governance included close monitoring and reflection of performance. This is classic OL behaviour.

Teacher training reform (UC)

This was a major new government approach to teacher training. Its adoption was compulsory for all teacher training colleges and schools. The teacher training school was an important part of the university: for it to continue in existence, there was no other option than to implement the reform. Reputation and, especially, legitimacy were clearly very important. The design was a government standard but the implementation needed to be carefully planned and executed with several local schools. Although there

was a business case and considerable adaptability and consultation, this innovation was essentially driven and specified by government edict. This is IC behaviour.

Retail and engineering programmes (FA)

This was the design and delivery of many bespoke and generic vocational programmes at all levels for both the service and engineering faculties. Their instigation and successful implementation over several years was due to the vision and drive of several senior managers. The business case for each programme was based on strategic alignment, a positive cost-benefit forecast and an improved reputation. There was no government compulsion, except indirectly through changes in core funding streams. There was no element of competitor imitation. Reputation and continued legitimacy were important. Employers, sector skills councils and validating universities were involved in curriculum design and implementation. Governance included close monitoring of and reflection on performance. This is OL behaviour. Although employer vocational programmes are now the sector norm, the driver was a genuine focus on market demand and not sector legitimacy.

Logistics programmes (FB)

This was the design and delivery of logistics programmes. The business case was based on strategic alignment, a positive cost-benefit forecast and an improved reputation. There was no government compulsion, except indirectly through changes in core funding streams. There was no element of competitor imitation. Reputation and legitimacy were important. Modules were tailored to the needs of the employers. This is OL behaviour. Although employer vocational programmes are now the sector norm, the driver was a genuine focus on market demand and not sector legitimacy.

DEVELOP TEACHING PRACTICES

Student assignment feedback (UB)

This objective was triggered by student pressure at the national and local level. The business case was based on the strategic objective of improving the student experience: the major input was the effort of already budgeted staff. The design was tailored to individual course needs, subject to common best practice guidelines. There has been considerable feedback from students. There was no question of government compulsion, competitor imitation or a relevant sector norm. Reputation and legitimacy with students were very important. This is OL behaviour.

Staff teaching certificate (UB)

This innovation was driven by a visionary pro vice-chancellor and the know-how of the director of teaching and learning. It involved a significant investment. The business case was based on the strategic objective of improving the student experience and a positive cost-benefit outcome. There was no question of government compulsion, competitor imitation or a relevant sector norm, although approval had to be granted by the HEA. Although staff teaching certificates are now commonplace, this particular design was unique. Reputation and legitimacy, but only with staff, were important.

There has been close monitoring, feedback from participants and reflection. This is OL behaviour.

Staff coaching (FB)

A specific approach to staff coaching had been pushed by LSIS for some time. The FE college wanted to improve its Ofsted grade to outstanding and it was felt that this initiative might contribute. LSIS provided funds and support. There was no compulsion by the government, except indirectly through pressure to seek a high Ofsted grade. Many FE colleges had already implemented the approach and it had become a sector norm. However, the implementation was very much tailored to this institution over a three year implementation period. Reputation and legitimacy were not directly important (except with regard to the objective of gaining an outstanding Ofsted grade). This has many elements of OL behaviour. However, this innovation is a sector norm and there was strong implicit Ofsted pressure.

IMPLEMENT TECHNOLOGY ENHANCED LEARNING

First generation VLE (UA)

This was an early implementation of a VLE. The vice-chancellor recognised that VLEs were beginning to matter to the student experience. Additionally, the university wanted a platform for distance learning in order to enter new international markets. There was support and funds from JISC and some vicarious learning from other universities. It was a tailored implementation of off-the-shelf software modules. There was no government compulsion or direct imitation. However, it was clear that VLEs would become the norm. Reputation and legitimacy with students were important. Essentially, this is OL behaviour.

Second generation VLE (UA)

After 12 years, the first generation VLE was no longer supported by the supplier and two business cases were developed to justify, firstly, investing in a new VLE, and, secondly, the selected new supplier. By now, a VLE was a sector norm and considered an essential part of the student experience. There was no government compulsion or direct competitor imitation. The choice of supplier was pioneering and the design and implementation were tailored to the needs of the university. A continuing high reputation and legitimacy with students were important. This is a replacement of an existing facility and, although it is now a sector norm, it would be a reasonable approach for it to retain its original OL classification.

First generation VLE (UC)

In about 2000, the visionary and charismatic vice-chancellor had seen that VLEs in the USA were being a powerful influence on the student experience. Three different agency grants were won. An in-house solution was developed over several years to meet internal needs. An internal technology consultative group played a leading role in design, implementation and feedback monitoring. There was no compulsion by the

government or direct competitor imitation. Reputation and legitimacy with students were not important at first. This is OL behaviour.

First and second generation VLE (FA)

The driver for the adoption of Moodle was to improve the student experience. It is not known whether there was originally a business case, although this has been the norm for investments in the college for several years. Modifications to Moodle are authorised by a teaching and learning group, who have a discretionary pot of money. There was no government compulsion. It is not known whether competitor imitation was an original factor. Since the original introduction, there have been considerable tailoring of off-the-shelf modules. Reputation and legitimacy with students are important. The innovation has been a great success in terms of utilisation, input to quality assessments and student satisfaction. Moodle 2 had just been implemented. On balance, this is OL behaviour.

First generation VLE (FB)

Although Moodle has been implemented for several years, utilisation has been patchy. Only recently has implementation been given attention. The driver for the resurrection of the project was to improve the student experience, but there would also appear to have been an element of wishing to catch up with sector norms. There was no government compulsion. Reputation and legitimacy with students are important. Implementation is heavily tailored with exhaustive consultation. There are significant elements of OL behaviour. However, the institution is attempting to catch up with a sector norm.

Lecture video capture (UB)

The learning and training manager had a remit to scan for new technology and had come across the lecture video capture facility. A business case was made based on alignment with the strategic objective of improving the student experience. The project was funded from a discretionary pot of money controlled by the technology consultative group. The facility has been developed in-house over a five year period and is now considered very successful. There has been considerable internal feedback and adjustment. There has been no element of government compulsion, competitor imitation or relevant sector norm. Reputation and legitimacy are not relevant. This is OL behaviour.

Electronic voting systems (UC)

The trigger was an innovative lecturer who had developed a pilot and won a prize and funds for development. The business case for scaling up was based on the strategic objective of improving the student experience and a positive cost-benefit outcome. Development funds from two further agencies were obtained. There has been considerable internal consultation and feedback. After three years, most students have a mobile device which is embedded in the VLE and curriculum modules. There was no government compulsion, competitor imitation or relevant sector norm. The university has been a pioneer with this innovation. Reputation and legitimacy with students has increased. This is exemplar OL behaviour.

Electronic individual learning plans (FA)

The trigger was an Ofsted report comment. The FE college wished to respond urgently and scanned other FE colleges for suitable off-the-shelf software. After internal consultation, a supplier was selected and a pilot implemented prior to full operation.. There was no overt government compulsion, although the Ofsted comment was imputed pressure. There was imitation of peer group norm software. Reputation and, especially, legitimacy were very important. Essentially, because of the implicit compulsion, this is IC behaviour.

DEVELOP PARTNERSHIPS

Engineering partnership (UC)

The opportunity arose to lead a collaborative enterprise, consisting of several major engineering companies and agencies, in an applied engineering research and development project. The business case was built on the fit to strategic objectives and funding from three different agencies. There was no government compulsion, competitor imitation or sector norm. Reputation was much more relevant than legitimacy. This is OL behaviour.

International collaborative provision (UA)

The university was expecting a poor quality rating in a future collaborative provision inspection. The collaborative provision involved several programmes, many of which had several collaborative partners both in the UK and overseas. Any failure would have meant a significant loss of reputation and legitimacy, as well as a potential loss of business. There was no government compulsion, apart from the threat of failing the inspection. Neither competitor imitation or a sector norm were relevant. The solution was drawn from internal consultation and the personal experience of the manager. The changes were self-funding and successful. Essentially, because of the implicit regulatory compulsion, this is IC behaviour.

International teacher training project (UC)

The trigger was the opportunity to bid for an international project, which was the largest yet undertaken by the university and was for significant income. It was a strategic objective to enter this market place. There was no government compulsion or competitor imitation. The approach was a unique design with the client. There were extensive post implementation reviews. Reputation and potential legitimacy were important. This is OL behaviour. However, this innovation is an example of obtaining foreign student business which has become a sector norm and was a prior objective of this institution.

DEVELOP ESTATE

Twin campus (UA)

The context was regional changes in the socio-economic landscape. With the help of European funds, the university undertook a series of estates developments, led by key internal players at different times. This transformed fragmented and dilapidated buildings into a modern and inspiring campus. There was no government compulsion or overt competitor imitation. The result was hugely beneficial to the institution's reputation. Legitimacy was less relevant. This is essentially OL behaviour, although the pursuit of shiny new buildings was very much a sector norm at the time.

RESTRUCTURE ORGANISATION

Twin mergers (FA)

On two occasions, the FE college was asked by the funding body (strongly supported by the local council) to take-over local colleges which were failing for reasons of financial or quality performance. The visionary and charismatic principal saw not only the prospect of raising the merged college up to the performance level of the prime college and of rationalising the curriculum to improve the offering to students, but also building an institution of immense benefit to the city. There was no government compulsion, competitor imitation or relevant sector norm. Reputation and legitimacy were very much on the line. There was extensive internal and external consultation. Governance included a close monitoring of and reflection on performance. This is OL behaviour.

APPENDIX J

CONVERGENCE IN THE TERTIARY EDUCATION SECTOR

This appendix contains the summarised views of the interviewees with regard to three current issues in the UK tertiary education sector, as to whether there will eventually be convergence to a single business model, a few segmented business models or a continuous spectrum of business models.

1. **Whether the corporate mission will emphasise research or teaching and learning.**

One of the mission variables for a UK university is whether to focus on being research intensive or to focus on teaching and learning. The consensus amongst interviewees was that a segmented sector model would prevail. This model would have three main categories, although interviewees were reluctant to say that the sector would converge on these three categories as they thought there would be many shades of grey.

The first category are the research intensives. This mainly consists of the Russell Group and 1994 Group plus some other pre and post 1962 universities who are trying to make the step up. These universities must maintain research excellence on a broad front. Typically, internal promotion is dependent on research reputation. This is an increasingly global market place.

The second category is universities who focus on teaching and learning. This includes many of the newly formed universities, FE colleges who undertake HE and private universities, often offering niche curricula, who are predicted to increasingly come on stream with the government's encouragement. It is likely that many of the old polytechnics will have a widening participation focus with a relatively lower entry level while the newer universities will focus on productivity and price. There was some concern amongst interviewees that VLE based distance learning courses will become commodity products.

The third category are so called "hybrid" universities who will try to focus on both research and teaching and learning. It is likely that their research will be in niche areas rather than on a broad front and be more applied than pure. In non-niche research areas, there will still be pedagogic research. The term research led teaching and learning is often used.

The research assessment process and the increasing level of global competition is going to lead to more of a gap between these categories.

2. The policy approach to widening participation.

It should be noted that the generally accepted definition of a disadvantaged student is one who comes from a family background where no one previously has been to university. However, the definition used by the government is a student from a state school as opposed to a private school.

Whilst all educationalists nowadays believe that everyone in the UK, whatever the accidents of their birth, should have equal access to higher education, the interpretation of what that means and the solutions for delivering it have been the subject of much debate and, consequently, different approaches by different universities. The consensus amongst interviewees was that this would always be so and that there would not be a convergence on one approach.

Governments have frequently encouraged universities to take disadvantaged students - for example, by giving a premium funding allowance (incidentally, this has been recently reduced by the current government) or by linking approval of fee structures to fair access agreements.

Elite universities have often been criticised for not taking their fair share of disadvantaged students, particularly as there is some evidence that the proportion of disadvantaged applicants to these universities matches the proportion in non-elite universities and that therefore disadvantaged students are somehow put off by the process in elite universities.

There are basically three approaches to solving the problem.

The first approach is to act when students are 18 and ready to go to university and to offer bursaries to students who have the required grades but who are financially disadvantaged and otherwise less likely to take up a place. This might be called the Oxbridge approach.

The second approach, attempted by many post 1962 and post 1992 universities is to spend considerable effort and resources in visiting schools, having open days, etc., deliberately targeting 12-15 year olds in order to raise the aspirations of these youngsters and to enable them to see that university can be for them.

The third approach is to lower entry standards on the assumption that disadvantaged children are less likely to be able to do themselves justice in entry examinations because of poor schools/ home life. This approach is adopted by some post 1992 and newer universities. An alternative to this approach has been the introduction of foundation degrees which is a lower degree with lower entry standards but which can be topped up to a full degree. Another approach is to accept work experience as an alternative means of demonstrating the ability to take on a degree. Some concern was expressed by one interviewee of the situation in the USA, where regulation is more relaxed, and some commercial universities have recruited huge numbers of students with low grades and with little chance of completing their degrees.

3. The business model with regard to international students.

UK universities have had an international presence for many years. Several aims are cited – competition is global and universities need to be global players; a cosmopolitan campus is good for parochial UK students; a wish to help disadvantaged countries; and, finally, and by no means least, to earn a healthy income – often as much as 25% of total income. Most international students come from the middle and far east and the main recipient universities are those English speaking ones in the USA, UK and Australia. There are several approaches – foreign students studying in the UK; UK universities setting up joint ventures in foreign countries with local colleges – either through direct or collaborative provision; a flying faculty with UK staff teaching abroad in intense blocks; and, finally, the growing trend in distance learning.

The consensus among interviewees was that there would continue to be a spectrum of approaches, largely driven by market circumstances, which are likely to change significantly over time. Many interviewees thought that the market was getting very difficult for several reasons – the increased level of global supply/ competition; the high cost of UK degrees; and Border Agency issues concerning UK immigration - and that consequently their institution would be unlikely to meet its future targets.

A typical quote was “international markets are so competitive and open to almost anyone who is a decent provider” and “brand is everything to maintain a good flow of students” (UC3).